

Draft Environmental Impact Statement for the Thurston County Habitat Conservation Plan in Thurston County, Washington

Prepared for

Thurston County
and
U.S. Fish and Wildlife Service

Prepared by

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Prepared by Confluence Environmental Company, Seattle, Washington.
September 2021.

SEPA FACT SHEET

Project Title

Thurston County Habitat Conservation Plan (Thurston County HCP)

Nature and Location of Proposed Action and Alternatives

This environmental impact statement (EIS) is a joint document issued under Section 102(2)(C) of the National Environmental Policy Act (NEPA) at 42 U.S. Code § 4321 and under the Washington State Environmental Policy Act (SEPA) as provided in RCW 43.21C.030 and WAC 197-11. Thurston County (County) has applied to the U.S. Fish and Wildlife Service (USFWS) for an incidental take permit (ITP) under section 10(a)(1)(B) of the ESA. The ITP, once issued, would allow the County to conduct, permit, or otherwise authorize activities in and around the habitat of species listed as threatened or endangered under the Endangered Species Act (ESA) for 30 years. As part of its application to USFWS, the County has developed a comprehensive habitat conservation plan (HCP) for the conservation of habitat for six wildlife species that occur on lands and that could be affected by County permitted or authorized activities. The USFWS, as the lead agency under NEPA, and Thurston County Community Planning and Economic Development Department, as the lead agency under SEPA, have drafted this joint NEPA and SEPA environmental impact statement to analyze the effects of ITP issuance to the County and subsequent HCP implementation.

Location

The location for implementation of the Thurston County HCP is the jurisdictional area of Thurston County, inclusive of the unincorporated area of the county and designated urban growth areas.

Applicant

Thurston County Community Planning and Economic Development Department

SEPA Lead Agency

Thurston County Community Planning and Economic Development Department

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Required Approvals

Federal: Incidental Take Permit Issuance/Habitat Conservation Plan Approval

Local: Approval of Habitat Conservation Plan implementing ordinance by Thurston County Board of County Commissioners

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Date of Draft EIS Issuance

September 24, 2021

Draft EIS Comment Due Date

Comments on this Draft EIS are due on or before November 8, 2021. Comments may be submitted electronically or in writing to the office of the responsible official.

Public Meeting Location

Public meetings will be held virtually. See the project website (www.ThurstonHCP.org) for meeting dates and access information.

Timing of Final Agency Action

Final agency actions will include decisions by the Thurston County Board of County Commissioners at the local level and USFWS at the federal level. The Board of County Commissioners must take action to approve implementation of the HCP through local ordinance after holding a public hearing. Final action by USFWS would be a Record of Decision (ROD) for ITP issuance but is outside of the purview of SEPA.

Type and Timing of Subsequent Environmental Review

After final decisions by USFWS and the Thurston Board of County Commissioners, no additional environmental review of the HCP is anticipated. Individual projects that have their own federal nexus would implement their own appropriate environmental review specific to the action or actions. Individual projects covered by the HCP would be subject to review through local permit procedures detailed in the Thurston County Code.

Location of Background Information

Background material for this EIS, including supporting technical reports, is available at www.ThurstonHCP.org. Background materials can be reviewed at the Thurston County Community Planning and Economic Development Department office location listed above.

Draft EIS Availability

This Draft EIS is available at www.ThurstonHCP.org. Copies of the Draft EIS can also be reviewed at the Thurston County Planning and Economic Development Department office location listed above.

NEPA COVER SHEET

Project Title

Thurston County Habitat Conservation Plan (Thurston County HCP)

Abstract/Brief Description of Proposed Action and Alternatives

This Draft EIS is a joint document issued under Section 102(2)(C) of the National Environmental Policy Act (NEPA) at 42 U.S. Code § 4321 and under the Washington State Environmental Policy Act as provided in RCW 43.21C.030 and WAC 197-11. Thurston County (the County) has applied to USFWS for an ITP under section 10(a)(1)(B) of the ESA. The ITP, once issued, would allow the County to conduct, permit, or otherwise authorize activities in and around the habitat of species listed as threatened or endangered under the ESA for 30 years. As part of its application to USFWS, the County has developed a comprehensive HCP for the conservation of habitat for six wildlife species that occur on lands and that could be affected by County permitted or authorized activities. The location for implementation of the Thurston County HCP is the jurisdictional area of Thurston County, inclusive of the unincorporated area of the county and designated urban growth areas. The principal alternatives discussed in the Draft EIS include a No Action Alternative, the Proposed Action, and a Modified HCP Alternative, which would require all mitigation to be provided on new habitat reserves.

This Draft EIS was prepared to thoroughly examine the potential environmental impacts of the proposed action and alternative actions in order to support informed decision-making. This Draft EIS is consistent with the purpose and goals of NEPA; the requirements of the Council on Environmental Quality's (CEQ) implementing NEPA regulations at 40 CFR Parts 1500-1508; longstanding federal judicial and regulatory interpretations; the Department of the Interior's NEPA regulations (43 CFR Part 46); and Administration priorities and policies including Secretary's Order No. 3399 requiring bureaus and offices to use "the same application or level of NEPA that would have been applied to a proposed action before the 2020 Rule went into effect."

Applicant

Thurston County Community Planning and Economic Development Department

Lead Agencies

The USFWS is the lead agency under NEPA.

Required Approvals

- Federal: Incidental Take Permit Issuance/Habitat Conservation Plan Approval
- Local: Approval of Habitat Conservation Plan implementing ordinance by Thurston County Board of County Commissioners

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Draft EIS Comment Due Date

November 8, 2021

Achievement of NEPA Policy Goals

NEPA was established to “encourage productive and enjoyable harmony” between humans and the environment; to promote efforts that will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of people; and to enrich the understanding of the ecological systems and natural resources important to the Nation.¹ To achieve these objectives, NEPA makes it the continuing policy of the Federal Government to use all practicable means and measures to create and maintain conditions under which humans and nature can exist in productive harmony and fulfill the social, economic, and other requirements of present and future generations of Americans.² NEPA’s policies are achieved, by preparing “detailed statements” to inform agency decision-making.³ In particular, well established judicial precedent holds that federal agencies are required to take a “hard look” at the potential environmental consequences of their actions through the NEPA process.⁴

On July 16, 2020, the Council on Environmental Quality (CEQ) issued a final rule updating NEPA implementing regulations (“2020 Rule”).⁵ The 2020 Rule went into effect on September 14, 2020, and it applies to any NEPA process begun after September 14, 2020.⁶ The NEPA process for evaluating Thurston County’s incidental take permit request began on October 16, 2020, when a notice of intent to prepare an EIS was published in the Federal Register.⁷ Therefore, the procedural requirements of the 2020 Rule apply to analysis of Thurston County’s incidental take permit request. The scope and depth of this NEPA analysis was not altered by the application of the 2020 Rule.

To the fullest extent possible, the USFWS interprets government policies, regulations, and public laws to require the generation of NEPA analysis that is appropriate in both scope and depth for use in informing agency decision-making.

The scope and depth of this NEPA analysis is intended to be consistent with:

- NEPA statutory requirements;
- CEQ’s NEPA regulations;
- longstanding federal judicial and regulatory interpretations;
- Department of the Interior NEPA regulations⁸ and guidance;⁹ and
- Administration policies directing federal agencies to “listen to the science” when considering decisions that may have environmental consequences including, without limitation, climate change, public health, environmental justice, and economic consequences.¹⁰

In view of the above, this Draft EIS takes a hard look at the potential environmental consequences of each alternative, including the effects of those alternatives when combined with reasonably foreseeable future actions and environmental trends, to determine if significant impacts to the human environment would occur.

¹ 42 USC § 4321

² Id. at § 4331

³ 42 USC § 4332

⁴ See *Kleppe v. Sierra Club*, 427 U.S. 390, 410, n.21 (1976) (in NEPA cases, courts must “insure that the agency has taken a ‘hard look’ at environmental consequences”).

⁵ 85 Fed. Reg. 43304 (Jul. 16, 2020)

⁶ 40 CFR § 1506.13

⁷ 85 Fed. Reg. 65861 (Oct. 16, 2020)

⁸ 43 CFR Part 46

⁹ SO No 3399, *Department-wide Approach to the Climate Crisis and Restoring Transparency and Integrity to the Decision-Making Process*, 2021 WL 1584759 (April 16, 2021),

¹⁰ Executive Order No. 13990, *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis*, 86 FR 7037 (Jan. 25, 2021); and E.O. 14008, *Tackling the Climate Crisis at Home and Abroad*, 86 FR 7619 (Feb. 1, 2021).

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ACRONYMS AND ABBREVIATIONS

ACHP	Advisory Council on Historic Preservation
AIAN	American Indian and Alaska Native
APE	Area of Potential Effects
AR	at risk
BMP	best management practice
BNSF	Burlington Northern Santa Fe
CAO	Critical Areas Ordinance
CFR	Code of Federal Regulations
County	Thurston County
CWA	Clean Water Act
DAHP	Washington State Department of Archaeology and Historic Preservation
DNR	Washington State Department of Natural Resources
Ecology	Washington State Department of Ecology
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FR	Federal Register
FTA	Federal Transit Administration
GMA	Washington State Growth Management Act
HCP	Habitat Conservation Plan
HPA	Hydraulic Project Approval
I-5	Interstate 5
ITP	incidental take permit
JBLM	Joint Base Lewis-McChord
MBTA	Migratory Bird Treaty Act
MPG	Mazama pocket gopher
NEPA	National Environmental Policy Act
NHOPI	Native Hawaiian or Other Pacific Islander
NHPA	National Historic Preservation Act
NPDES	National Pollution Discharge Elimination System
NPF	not properly functioning
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
OPG	Olympia pocket gopher
OSF	Oregon spotted frog
OVS	Oregon vesper sparrow
PF	properly functioning

ACRONYMS AND ABBREVIATIONS (CONTINUED)

PHS	Priority Habitats and Species
PM	particulate matter
PSAP	Puget Sound and Pacific
PSE	Puget Sound Energy
RCW	Revised Code of Washington
RPA	Reserve Priority Areas
SEPA	Washington State Environmental Policy Act
SMA	Special Management Area
SR	State Route
SHPO	State Historic Preservation Officer
SWMP	Solid Waste Management Plan
TCB	Taylor's checkerspot butterfly
TCC	Thurston County Code
TCCP	Thurston County Comprehensive Plan
THPO	Tribal Historic Preservation Officer
TIA	total impervious area
TPG	Tenino pocket gopher
TRPC	Thurston Regional Planning Council
UGA	urban growth area
UP	Union Pacific
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WHBR	Washington Heritage Barn Register
WHR	Washington State Register of Historic Places
WNHP	Washington Natural Heritage Program
WRIA	Water Resource Inventory Area
WSDA	Washington State Department of Agriculture
WSDOT	Washington State Department of Transportation
YPG	Yelm pocket gopher

1. INTRODUCTION AND SUMMARY

1.1 Introduction and Regulatory Framework

Thurston County (the County) has applied to the U.S. Fish and Wildlife Service (USFWS) for an incidental take permit (ITP) under Section 10(a)(1)(B) of the Endangered Species Act (ESA). Proposed non-federal actions that are likely to cause the incidental take of endangered and threatened species may obtain an ESA (16 USC § 1531–1544) Section 10(a)(1)(B) ITP from USFWS authorizing such take, or measures must be implemented to avoid that take of those species to avoid violating Section 9 of the ESA. As defined in ESA Section 3(19), the term take means to “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct” (50 CFR § 18.3).

The ITP, if issued, would allow the County to conduct, permit, or otherwise authorize specific activities in and around habitat for certain species listed as threatened or endangered under the ESA or otherwise covered under the HCP for 30 years. As part of its application to USFWS, the County has developed a comprehensive Habitat Conservation Plan (HCP) for the conservation of habitat for six wildlife species that occur on lands that could be affected by County-permitted or authorized activities within its 412,228-acre permitting jurisdiction.

This Environmental Impact Statement (EIS) analyzes effects of permit issuance and associated implementation of the Thurston County HCP over the proposed 30-year term of the ITP. The Thurston County HCP is also referred to as the HCP in this EIS. This EIS is a joint document issued under Section 102(2)(C) of the National Environmental Policy Act (NEPA) at 42 USC § 4321 and under the Washington State Environmental Policy Act (SEPA) as provided in RCW 43.21C.030 and WAC 197-11. The USFWS is the lead agency under NEPA, and the Thurston County Community Planning and Economic Development Department is the lead agency under SEPA.

SEPA requires that this section of the EIS provide a brief summary of the proposal and alternatives, state the proposal's objectives, specifying the purpose and need for the proposal, and summarize impacts, mitigation measures, and significant adverse impacts that cannot be mitigated (WAC 197-11-440(4)). This section is also required to state major conclusions, significant areas of controversy and uncertainty, and issues to be resolved, including the environmental choices to be made among alternatives as well as the effectiveness of mitigation measures. The following sections address each of the requirements of WAC 197-11-440(4).

The following terms used in the Thurston County HCP are defined briefly below and discussed in more detail in Chapter 2, Proposed Action and Alternatives.

- The **applicant** is Thurston County.
- The **covered species** are those species for which the applicant is seeking incidental take coverage. The covered species include six species, five of which are listed under the ESA: three subspecies of the Mazama pocket gopher (Olympia pocket gopher, Tenino pocket gopher, and Yelm pocket gopher), Taylor’s checkerspot butterfly, and Oregon spotted frog. One additional species proposed for coverage, the Oregon vesper sparrow, is currently under review to determine whether federal listing is warranted; the Washington State Fish and Wildlife Commission has classified the Oregon vesper sparrow as endangered (WAC 220-610-101).
- The **covered activities** are the activities with the potential to result in take of covered species for which the applicant is applying for incidental take coverage. These are certain activities conducted, permitted, or authorized by the County, as described in Section 2.1.1.1.

- The **conservation strategy** is a series of conservation measures implemented by the applicant to reduce and fully offset the impacts of the taking of covered species from covered activities. The HCP also includes measures to monitor and adapt the conservation strategy measures to meet biological goals.
- The **permit term** is the length of time covered by the ITP. The permit term proposed in the Thurston County HCP is 30 years.
- The **permit area** encompasses the lands over which Thurston County has permitting authority and where the covered activities and resulting take would occur (Figure 1.1-1). The permit area would cover approximately 412,228 acres.
- **Mitigation** in the HCP is the offset of the impact of the taking on a covered species with a compensatory environmental benefit for the covered species, typically generated through ecological protection, restoration, or enhancement and verified through a monitoring program. In addition to offsets, the HCP conservation program also reflects impact avoidance and impact minimization through limitation of the degree or magnitude of the HCP-covered activities. In this EIS, mitigation can also refer to measures that avoid, minimize, or compensate for effects on other resources caused by a proposed action or alternatives, consistent with WAC 197-11-768 and 40 CFR 1508.1.

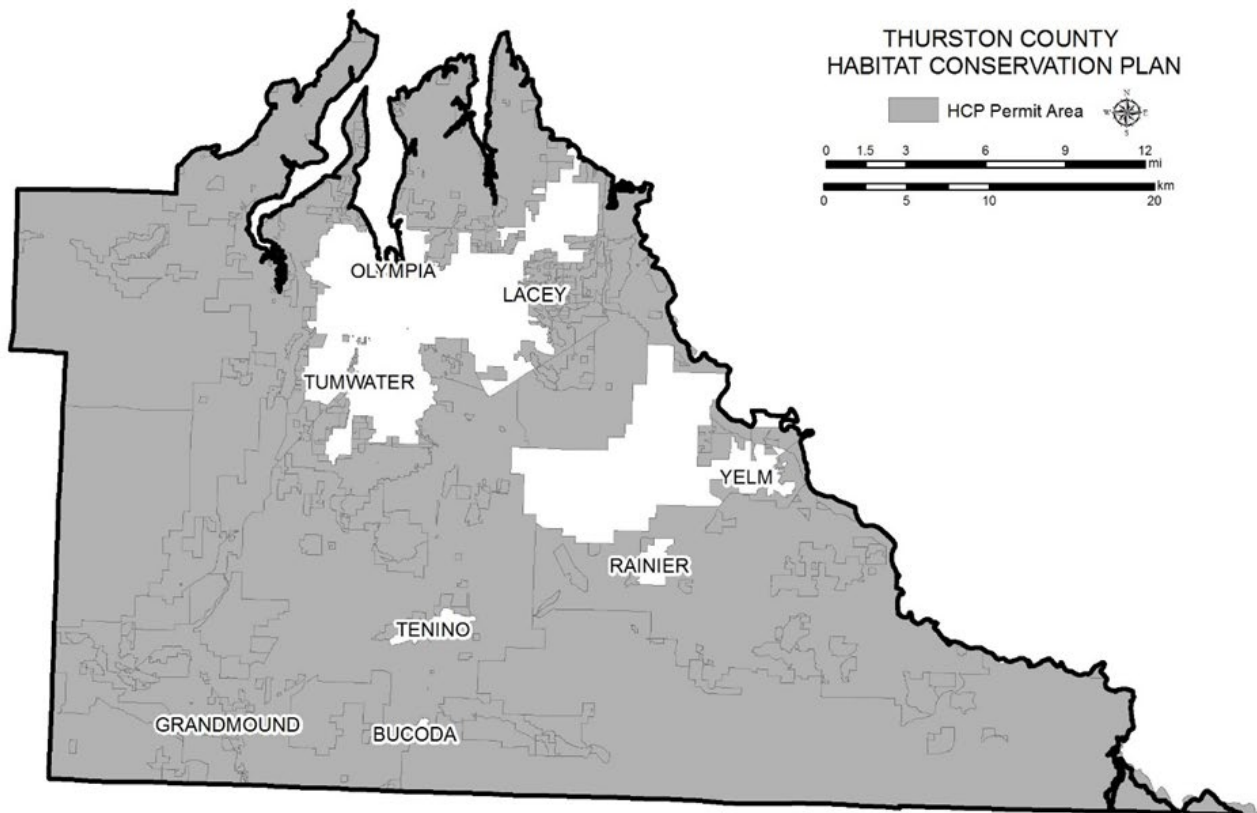


Figure 1.1-1. Proposed Permit Area of the Thurston County Habitat Conservation Plan

1.2 Purpose and Need

NEPA (40 CFR 1502.13) requires an EIS to briefly describe the underlying purpose and need for the federal agency's proposed action, based on the goals of the applicant and the agency's authority. SEPA (WAC 197-11-440(4)) similarly requires that an EIS contain a statement of the applicant's objectives, including purpose and need. The following describes the NEPA purpose and need and the applicant's objectives under SEPA.

1.2.1 Purpose and Need for the Proposed Action (NEPA)

In accordance with section 10(a)(2)(B) of the ESA, Thurston County has submitted the draft Thurston County HCP in support of an ITP application for the endangered Taylor's checkerspot butterfly; the threatened Yelm pocket gopher, Olympia pocket gopher, Tenino pocket gopher, and Oregon spotted frog; and the Oregon vesper sparrow, which is under review to determine whether federal listing under the ESA is warranted. The requested permit would authorize incidental take of covered species caused by the impacts of County-permitted development activities as well as construction and maintenance of County-owned or County-managed infrastructure for a period of 30 years. The HCP includes minimization and mitigation measures to fully offset the impacts associated with the taking of covered species.

To meet NEPA requirements, this Draft EIS has been prepared, and a Final EIS will be prepared, to evaluate the effects of issuing the requested permit and Thurston County's implementation of the Thurston County HCP. The County's goals include providing long-term certainty for growth and economic development in Thurston County, supporting listed and rare species, protecting and maintaining working lands and agriculture, and improving local control over covered activities. USFWS' purpose and need for the proposed action under NEPA are as follows:

- To process the County's request for an ITP, the issuance of which is necessary to meet the County's development and biological goals
- To inform USFWS's decision to grant, grant with conditions, or deny the ITP request in compliance with USFWS's authority under applicable law, including, without limitation, Section 10(a) of the ESA and applicable ESA implementing regulations

1.2.2 Applicant's Objectives (SEPA)

The following are the objectives of Thurston County in preparing and presenting the Proposed Action:

- Enable the County to efficiently implement the HCP within their jurisdiction area.
- Protect and enhance species and assure long-term population viability by preserving and managing natural communities that support them.
- Provide citizens with a streamlined permitting process, resulting in improved habitat conservation and planning certainty.
- Provide a basis for permits and authorizations to lawfully take certain wildlife species, including species that are listed as threatened or endangered pursuant to the terms of ESA.
- Provide a comprehensive means to coordinate and standardize mitigation and compensation requirements of the ESA, NEPA, SEPA and other applicable laws and regulations related to species and habitats within Thurston County's jurisdiction so that public and private actions would be governed equally and consistently, resulting in reduced expenses, delays, and regulatory duplication.

These objectives are partially achieved through the HCP-proposed conservation program, which will manage and protect habitat on contiguous and biologically parcels. The remainder of objectives are met through implementation of frameworks and interagency cooperation integral to the HCP.

1.3 Approach to Analysis

Activities covered by the ITP that would result in incidental take must comply with conservation measures outlined in the Thurston County HCP to avoid, minimize, and/or mitigate impacts to habitats and species. This EIS analysis refers to the issuance of the requested ITP and implementation of the proposed HCP as the Proposed Action. Chapter 3 (Affected Environment, Impacts, and Mitigation Measures) evaluates the impacts of the Proposed Action on the natural and human environment, based on available information, including the HCP. The analysis is structured to address both NEPA and SEPA requirements. Analyses in this EIS address effects of the covered activities and conservation strategy, including effects that result immediately from the action and those that would accrue over time from the action, in light of other actions that would occur in the affected environment. Effects of alternatives to the Proposed Action are also addressed.

For NEPA, analyses in this EIS also address changes to the human environment from the Proposed Action or alternatives that are reasonably foreseeable and have a reasonably close causal relationship to the Proposed Action or alternatives, including those effects that occur at the same time and place as the Proposed Action or alternatives, as well as effects that are later in time or farther removed in distance. The County has provided planning-level information for the covered activities; the precise timing and locations of many covered activities are not known at this time. Effects analyses in this document reflect this uncertainty.

Resource analyses address potential impacts of the Proposed Action, one action alternative (the Modified HCP Alternative), and the No Action Alternative. Effects of the No Action Alternative are considered in light of existing conditions and focus on the natural and human environment absent the take authorization or conservation program outlined in the HCP. The Proposed Action and the Modified HCP Alternative include comparisons of short-term and long-term changes (adverse or beneficial) in conditions and trends, as well as any identifiable modifications to the current rate of change in the condition of a given element of the environment. The evaluation of effects for each resource area is based on the impact thresholds defined for that resource area, and the impacts of the action alternatives are compared to those of the No Action Alternative. The context (potentially affected environment) and intensity (degree of the effects of the action) of the potential impacts are considered when making effects conclusions. Based on the effect thresholds, impacts are determined to be significant, not significant, beneficial, or having no effect.

Impacts of the Proposed Action and alternatives are addressed concurrently with the impacts analysis in Chapter 3. The impact analyses in this EIS consider reasonably foreseeable environmental trends and planned actions in the affected environment. Past, present, and reasonably foreseeable future actions together form the reasonably foreseeable environmental trends. These trends are considered together with planned actions in each resource analysis to project the environmental effects of the alternatives. Through this approach, the impacts analyses consider planned actions and trends that would occur in the affected environment and that, when combined with the Proposed Action or alternatives, could result in greater or more intense effects than the Proposed Action or the action alternative considered alone. For SEPA, the emphasis for the cumulative impact analysis is to provide the level of information

needed to meet SEPA requirements and support the County's approval and adoption of the HCP and the USFWS ITP decision.

The term, "planned action(s)," has separate meanings and purposes under state and federal law. Under NEPA, 40 CFR § 1502.15 requires that an EIS succinctly describe the environment of the area to be affected by the alternatives under consideration, including the reasonably foreseeable environmental trends and planned actions in the area. Under SEPA (RCW 43.21C.440), the term "planned action" is defined as one or more types of development or redevelopment adopted by resolution or ordinance by a Growth Management Act (GMA) county, city, or town.

No "planned actions," as defined under SEPA, are proposed in the HCP, nor are any analyzed in this EIS. Therefore, the term, "planned action(s)," as used in this document, refers to planned actions included in the description of the affected environment made pursuant to 40 CFR § 1502.15. For this analysis, in the NEPA context, planned actions are those actions that may be considered fairly certain to occur—for example, actions that are funded and/or have been submitted for permitting reviews.

For this analysis, a **study area** (i.e., spatial boundary) is defined in Chapter 3 for each environmental discipline as the area of consideration and the area where the effects of the Proposed Action and alternatives would occur.

1.4 Proposed Action and Alternatives Summary

Following are brief overviews of the alternatives evaluated in this EIS. See Chapter 2 for more thorough descriptions of the Proposed Action and alternatives.

1.4.1 No Action Alternative

Under the No Action Alternative, USFWS would not issue incidental take authorization to the County, and the County would not implement the HCP. The County would continue to conduct, permit, and approve activities on a case-by-case basis in compliance with federal, state, and local requirements, including the Thurston County Critical Areas code. Where there is a federal nexus, Section 7 consultations for species listed as threatened or endangered under the ESA would be conducted for the project by the federal agency issuing a permit or funding. The County and individual project proponents would evaluate each project to ensure unauthorized take of ESA-listed species is avoided.

The County would not conduct activities or issue permits for activities that would have unauthorized impacts on ESA-listed species. Under the No Action Alternative, otherwise legal development and infrastructure maintenance projects to meet ongoing growth demands would proceed where unauthorized impacts to ESA-listed species can be avoided. Current County procedures rely on trained biologists to screen project sites for occupancy by these species before County-permitted or County-authorized activities can be conducted in modeled habitat for ESA-listed species (see Chapter 2 of the Thurston County HCP for a detailed discussion of the modeled habitat distribution for each covered species). If evidence of ESA-listed species is found at a proposed project site, the project proponent would withdraw or modify the project to avoid impacts to ESA-listed species. Where take ESA-listed species cannot be avoided, project proponents would have the option of preparing an individual HCP and applying for an ITP from USFWS. However, as explained in Section 2.1.1.2, impacts from future federal permit actions such as issuance of individual ITPs are not analyzed in this EIS. The cost and legal liability for site inspections and ESA compliance would be borne by the project proponents on a project-by-project basis.

Under the No Action Alternative, the County would not implement a coordinated, county-wide conservation program. Mitigation would not be required for impacts to potentially suitable habitat where occupancy by ESA-listed species has been evaluated using best available science and has not been detected. This alternative is the current situation in Thurston County.

The No Action Alternative would not provide long-term certainty for growth and economic development in Thurston County, nor would it improve local control over covered activities. In addition, the No Action Alternative would not provide improved conservation through the implementation of coordinated mitigation in consolidated areas.

1.4.2 Proposed Action

Under the Proposed Action, USFWS would, in accordance with applicable law, issue an ITP to Thurston County for the incidental take of covered species by the covered activities specified in the Thurston County HCP (Thurston County 2020f), which is incorporated by reference into this EIS. The County would fully implement the Thurston County HCP and its conservation program, including the implementation of minimization measures for covered activities; mitigation to fully offset the impacts of the taking of covered species; monitoring and reporting procedures; and commitments to ensure funding for HCP implementation. Mitigation would be achieved through the execution of conservation easements on working agricultural lands, the enhancement of existing conservation reserves, and the establishment of new conservation reserves. The conservation program would also include an adaptive management program to ensure biological goals are met. The term of the requested ITP is 30 years. Under the Proposed Action, the County would continue to conduct, permit, and approve activities in compliance with federal, state, and local requirements, including the Thurston County critical areas code.

The species proposed for incidental take coverage include one species that is listed under the ESA as endangered, four species that are listed as threatened, and one species currently under review for listing (Table 1.4-1).

Table 1.4-1. Thurston County HCP Proposed Covered Species

Common Name	Scientific Name	Federal Status	State Status
Olympia pocket gopher	<i>Thomomys mazama</i> spp. <i>pugetensis</i>	Threatened	Threatened
Tenino pocket gopher	<i>Thomomys mazama</i> spp. <i>tumuli</i>	Threatened	Threatened
Yelm pocket gopher	<i>Thomomys mazama</i> spp. <i>yelmensis</i>	Threatened	Threatened
Taylor's checkerspot butterfly	<i>Euphydryas editha taylori</i>	Endangered	Endangered
Oregon vesper sparrow	<i>Pooecetes gramineus</i>	Under Review	Endangered
Oregon spotted frog	<i>Rana pretiosa</i>	Threatened	Endangered

The proposed covered activities include a variety of actions and projects for which the County issues permits or authorizations or that it otherwise carries out, with limitations detailed in the HCP. These activities include residential development, development of accessory structures, installation, repair, or alteration of septic systems, commercial and industrial development, public service facility construction, transportation projects, transportation maintenance and other work within County-owned road rights-of-way, landfill and solid waste management, water resources management, and County parks, trails, and land management. The covered activities would not include mining authorizations, such as County-

permitted extraction of minerals, oil, gas, or other earth materials. The proposed covered activities are described further in Section 2.1.1.1 and in the HCP (Thurston County 2020f).

The HCP conservation program would specify measures for avoiding, minimizing, and mitigating for impacts to these species and their habitats. Project proponents seeking coverage under the Thurston County HCP would be required to obtain a certificate of inclusion under the ITP for proposed covered activities that result in unavoidable impacts to covered species. The conservation program would establish a network of permanently managed and monitored mitigation lands occupied by covered species. Conservation lands, habitat enhancements, and associated funding would be incrementally added to the permanent conservation network. The pace of these conservation actions would be managed to stay ahead of the impacts of covered activities on covered species. As part of the HCP's stay-ahead provisions, financial assurances and performance for both easement or property acquisition and permanent monitoring and management of sufficient conservation lands would be required before conducting additional covered activities. These sequences are detailed in the Chapter 7 of the HCP.

Mitigation for unavoidable impacts of covered activities on covered species would be accomplished through establishing new reserves on lands purchased from willing sellers, maintaining and enhancing existing habitat reserves, and working with willing landowners to establish conservation easements on working lands. Sites established as new reserves would be prioritized in areas identified by federal and state biologists as being the most important for, and the most likely to support, the long-term conservation and recovery of the covered *Mazama pocket gopher* subspecies (USFWS 2015b; USFWS 2017; Stinson 2020). These areas overlap with, or would be supplemented by, lands that also benefit other covered species (Table 1.4-1).

By streamlining development and supporting maintenance of working lands where compatible with landowner goals and species needs, the Proposed Action would address the County's goals of regulatory certainty, improved conservation, and local control.

1.4.3 Modified HCP with Mitigation on New Reserves Only Alternative

Under the Modified HCP with Mitigation on New Reserves Only Alternative (also referred to as the Modified HCP Alternative), as under the Proposed Action, USFWS would, in accordance with applicable law, issue an ITP to Thurston County with the same permit area, permit term, covered species, and covered activities as described for the Proposed Action. Many of the other elements of the HCP would be similar to those described for the Proposed Action. This alternative explores whether the HCP could be modified to provide higher conservation value to covered species by acquiring new habitat reserves and managing them to achieve the highest habitat quality. Conservation easements would not be executed on working agricultural lands, and enhancement of existing reserves would not be part of the mitigation strategy. Under the Modified HCP Alternative, fewer acres of new conserved habitat may be needed to fully offset the impacts of the taking on covered species. As under the Proposed Action, the County and project proponents would be responsible for financial assurances for permanent monitoring and management of each new reserve before conducting additional covered activities.

The Modified HCP Alternative would, in the same manner as the Proposed Action, streamline development and address the County's goals of regulatory certainty, improved conservation, and local control. The alternative conservation approach for covered species provided by the Modified HCP Alternative is consistent with the goals and objectives of the applicant under SEPA and with USFWS' purpose and need. By evaluating an alternative conservation approach for covered species, the Modified HCP Alternative meets the requirements for examining a range of alternatives under both SEPA and NEPA.

1.4.4 Alternatives Considered but Eliminated from Further Study

The County and USFWS considered alternatives for the makeup of the covered species list, covered lands (permit area) and entities, conservation strategies, permit term, and land divisions as alternatives to the Proposed Action. Each of these alternatives was analyzed for consideration and eliminated from further study. These alternatives are discussed in detail in Section 2.3 and summarized here in Table 1.4-2. Rationales for elimination from further study are provided in Section 2.3.

Table 1.4-2. Thurston County HCP Alternatives Considered but Eliminated from Further Study

Alternative Type	Alternative Title	Alternative Description
Covered Species List	All State and Federally Listed Species	HCP would cover all plant and animal species currently listed under the ESA or listed as threatened or endangered under Washington State law if those species could be negatively affected by the implementation of covered activities. To cover these species, the HCP would include additional conservation actions and monitoring.
	Sensitive, Candidate, and Listed Plant and Animal Species	HCP would cover sensitive, candidate, and state- or ESA-listed species that could be negatively affected by the implementation of covered activities, including mammals, birds, butterflies, amphibians, and plants. To cover these species, the HCP would include additional conservation actions and monitoring.
	Fewer Covered Species	HCP would cover fewer species than the Proposed Action. Under one scenario, the HCP would cover the same species as the Proposed Action, except the Oregon vesper sparrow. Under another scenario, the HCP would cover only the three subspecies of Mazama pocket gopher that occur under Thurston County jurisdiction.
Covered Lands and Entities	County-Owned Land or County Projects	HCP would be implemented only on lands owned by the County and/or for projects conducted by the County. Other landowners and project proponents in Thurston County would be required to avoid unauthorized take. Covered activities would be limited to the infrastructure development and maintenance that can occur on County-owned lands.
	County Jurisdiction Only Inside Urban Growth Areas	HCP would be implemented only for development in urban growth areas (UGAs), with the intent of concentrating development in already impacted areas.
	Coverage Includes Incorporated Cities	HCP would be implemented throughout all non-federal lands in Thurston County to include the incorporated cities in Thurston County.
	Smaller Permit Area	HCP would be implemented only in modeled habitat for covered species (approximately 115,000 acres, compared to 412,228 acres under the Proposed Action).
Other	Reduced Impact/Conservation Incentive Program	This alternative would focus County actions on enhancing ESA-listed species status to support species recovery. Under this alternative Thurston County would seek to purchase from willing sellers fee simple title and/or conservation easements on all un-developed high-quality prairies and listed-species habitat in the County. The USFWS would not issue a permit and Thurston County would not issue permits or conduct activities that impact ESA-listed species because the County would prioritize species recovery.
	Different Permit Duration	USFWS considered the permit duration carefully and identified that multiple factors of the Proposed Action, including but not limited to, the biological goals, functional-acre metrics, monitoring and adaptive management program, combine to make a shorter permit duration analytically inseparable from the Proposed Action. These elements work together to limit the risks to covered species under the Proposed Action.

1.5 Summary of Environmental Impacts Evaluated

This section summarizes the environmental impacts that would likely result from the No Action Alternative, implementation of the Proposed Action, or implementation of the Modified HCP Alternative. This analysis is limited to evaluating whether the Proposed Action and alternatives would represent a “significant unavoidable adverse impact” under SEPA or would “affect the quality of the human environment” under NEPA. Under SEPA, the Proposed Action and the Modified HCP Alternative would include the County’s adoption of the HCP, which is considered a non-project action. The classification of HCP adoption as a non-project action means that additional environmental review may be required in the future at the individual project level, concurrent with project permitting, to determine the potential for unavoidable adverse impacts.

This section would also typically summarize mitigation measures discussed in the EIS. Under all three alternatives, measures for avoiding, minimizing, and mitigating adverse effects on the resource areas addressed in this EIS would be implemented, as appropriate, in accordance with existing regulatory requirements, including the County’s comprehensive plan and critical areas regulations. Because the Proposed Action is adoption of a plan, along with permit issuance for plan implementation, mitigation is as defined in the HCP. As described in Section 1.1, HCP mitigation would include the full offset of the impacts associated with the taking of covered species through ecological protection, restoration, and enhancement proposed as part of the HCP conservation lands program. USFWS also considered potential mitigation measures for impacts to other resources in accordance with NEPA (40 CFR § 1502.14 and 1502.16). Mitigation is discussed in this context throughout this Draft EIS; each resource analyzes the relationship of the proposed mitigation, including the mitigation fee program, with the potential impacts of covered activities. Avoidance and minimization measures are also discussed as outlined in the HCP. Avoidance and minimization measures are included as they relate to each resource in Appendix C of this Draft EIS; final avoidance and minimization measures, along with mitigation fee requirements would be determined in concert with each development proposal after HCP adoption and ITP issuance. Refer to Section 1.4 for summaries of the alternatives included in Table 1.5-1.

Table 1.5-1. Summary of Environmental Impacts

Environmental Element/ Resource Area	No Action Alternative	Proposed Action	Modified HCP Alternative
Geology and Soils	County-permitted development projects and County infrastructure activities that occur outside of occupied habitat could result in impacts to soils from equipment use, which could disrupt native seed repositories and promote erosion. Plowing and other agricultural activities allowed under the 4(d) special rule could affect soil structures that support vegetation and wildlife. The 4(d) special rule provides a regulatory context for ongoing management of soil resources through agricultural activity, without which there would be increased pressures for land use conversion. These impacts would not represent a change from existing trends.	Construction of covered activities and the implementation of habitat restoration, enhancement, and management activities at mitigation sites could result in localized impacts to soils, which could disrupt native seed repositories and promote erosion. BMPs included in the HCP would be implemented to minimize impacts. Consistent with the Affected Environment and the No Action Alternative, 4(d) special rule farming and ranching allowances would continue. Some habitat management activities could affect soil structures over the short term but habitat restoration would result in long-term improvements to natural soil functions.	Construction of covered activities and the implementation of habitat restoration, enhancement, and management activities at mitigation sites could result in localized impacts to soils, which could disrupt native seed repositories and promote erosion. BMPs included in the HCP would be implemented to minimize impacts. Consistent with the Affected Environment and the No Action Alternative, 4(d) special rule farming and ranching allowances would continue. Some habitat management activities could affect soil structures over the short term but would result in long-term improvements to natural soil functions. Improvements in soil conditions from the conservation program would be slightly less extensive because of the slight reduction in mitigation land acreage associated with this alternative.
Air Quality	County-permitted development projects and County infrastructure activities could result in temporary increases in airborne dust and emissions from construction equipment near construction sites. These increases would be short-lived and confined to small areas near project sites, and they would not contribute to noticeable degradation of air quality in the study area.	Minor short-term and localized increases in airborne dust and equipment emissions would result from implementation of covered activities and subsequent mitigation site establishment and management. The conservation lands program aligns with the Thurston Climate Mitigation Plan, which includes such measures as prairie preservation and a reforestation/afforestation program.	Minor short-term and localized increases in airborne dust and equipment emissions would result from implementation of covered activities and subsequent mitigation site establishment and management. The conservation lands program aligns with the Thurston Climate Mitigation Plan, which includes such measures as prairie preservation and a reforestation/afforestation program. The conservation network under this alternative would cover approximately 360 fewer acres than the Proposed Action.

Table 1.5-1. Summary of Environmental Impacts (continued)

Environmental Element/ Resource Area	No Action Alternative	Proposed Action	Modified HCP Alternative
Water Resources	Construction and development projects are projected to result in increases in the area of impervious surfaces in the Middle and Lower Deschutes River Watershed, consistent with existing and projected development trends. Effects of impervious surfacing would include increased runoff and pollutant loading, reduced shade, flood storage, and pollutant filtration, increasing toxics in surface waters and wetlands. Current Thurston County and Ecology stormwater requirements would minimize, but not fully eliminate, impacts to water resources.	Construction of covered activities and the implementation of habitat restoration, enhancement, and management activities at mitigation sites would not result in water resource impacts greater than those of the No Action Alternative. With implementation of the conservation lands program under the Proposed Action, a modest shift in development within Thurston County planning watersheds may be realized, but no real change in development trends that would affect impervious surfacing and related pollutant loading would be likely to occur. Some development pressure on certain residentially zoned lands currently in farm-related use that may be converted to residential use under the No Action Alternative and the Modified HCP Alternative may be relieved through working land easements associated with the HCP, thus resulting in a slightly lower level of impervious surfacing and associated pollutant loading in watersheds where these easements may occur.	Construction of covered activities and the implementation of habitat restoration, enhancement, and management activities at mitigation sites would not result in water resource impacts greater than those of the No Action Alternative. With implementation of the conservation lands program under the Modified HCP Alternative, only a slight shift in development within Thurston County planning watersheds may be realized. The emphasis on new reserves with the Modified HCP Alternative would place more development pressure on residentially zoned lands currently in agricultural use, thus possibly resulting in more impervious surfacing associated with development of these lands compared to the Proposed Action.
Plants and Animals	Direct impacts to plants and animals in habitats occupied by ESA-listed species would be avoided. Habitat fragmentation could occur with development activities within unoccupied habitat. Existing habitat blocks with connection corridors to additional habitat areas and types could become a patchwork of smaller habitat areas that isolate populations and decrease species diversity.	Direct impacts to plants and animals in occupied habitat would occur. Minimization and mitigation measures in the HCP, including establishment and management of conservation lands in prairie and wetland/riparian habitats, would fully offset the impacts associated with the taking of covered species. Conservation lands would provide large habitat blocks of non-fragmented habitat that supports native plants and animals, thus preserving diversity and preventing species decline into the future.	Direct impacts to plants and animals in occupied habitat would occur. Minimization and mitigation measures in the HCP would fully offset the impacts associated with the taking of covered species. The conservation land program would provide one large block of non-fragmented habitat within each habitat type (prairie and wetland/riparian) that supports native plants and animals, thus preserving diversity and preventing species decline into the future.

Table 1.5-1. Summary of Environmental Impacts (continued)

Environmental Element/ Resource Area	No Action Alternative	Proposed Action	Modified HCP Alternative
Noise	<p>Construction of development projects could result in temporary increases in noise levels near construction sites. These increases would be short-lived and confined to small areas near project sites.</p> <p>Long-term changes in noise levels would be due to increased vehicular traffic and other activities in areas where development contributes to increased levels of human activity, notably in areas of greater zoning density, near commercial or industrial development, and near major roadways.</p> <p>Compliance with local noise ordinances would prevent development projects from exceeding maximum allowable noise levels at locations of sensitive receivers.</p>	<p>Construction of covered activities and the implementation of habitat restoration, enhancement, and management activities at mitigation sites could result in temporary increases in noise levels. These increases would be short-lived and confined to small areas near project sites.</p> <p>As with the No Action Alternative, compliance with local noise ordinances would prevent long-term exceedance of maximum allowable noise levels at locations of sensitive receivers.</p>	<p>Construction of covered activities and the implementation of habitat restoration, enhancement, and management activities at mitigation sites could result in temporary increases in noise levels. These increases would be short lived and confined to small areas near project sites.</p> <p>Compared to the Proposed Action, noise generated by mitigation activities would occur on fewer sites; therefore, fewer people would be exposed to mitigation-generated noise.</p> <p>As with the Proposed Action and the No Action Alternative, compliance with local noise ordinances would prevent long-term exceedance of maximum allowable noise levels at locations of sensitive receivers.</p>
Land Use	<p>No change to land use plans and policies currently in effect.</p> <p>Land use patterns may be affected by a slower pace of development due to permitting requirements for occupied lands and pressure to develop non-occupied lands could increase.</p> <p>Farm-related land use on large-lot residential land would follow the trend of conversion to non-farm uses with increased population pressure and the need for development of lands not occupied by ESA-listed species.</p>	<p>Land use plans and policies of Thurston County related to habitats occupied by ESA-listed species would be modified to include the HCP.</p> <p>Streamlined permitting would be available in up to 8,603 acres of prairie and 618 acres of wetland/riparian areas, which would increase development and associated population in these areas over the No Action Alternative.</p> <p>Agricultural activities would be retained on 433 acres of perpetual working lands easements, preventing conversion of these areas to non-farm use.</p>	<p>Land use plans and policies of Thurston County related to habitats occupied by ESA-listed species would be modified to include the Modified HCP.</p> <p>Streamlined permitting would be available in up to 8,603 acres of prairie and 618 acres of wetland/riparian areas, which would increase development and associated population in these areas over the No Action Alternative.</p> <p>Agricultural activities would be the same as the No Action Alternative.</p>

Table 1.5-1. Summary of Environmental Impacts (continued)

Environmental Element/ Resource Area	No Action Alternative	Proposed Action	Modified HCP Alternative
Recreation	Construction and management of County-owned parks, trails, and open spaces would occur only at sites where impacts to ESA-listed species can be avoided or where the activities could be implemented in accordance with the provisions of the 4(d) rule for Mazama pocket gophers.	<p>Park or trail maintenance and improvement projects would be streamlined because the activities would be covered by the HCP, so pre-project site evaluations to detect occupancy of covered species would no longer be necessary.</p> <p>Park maintenance and improvements that have been deferred due to a likelihood of impacts to covered species would occur under the Proposed Action, including specific park improvement projects identified in the HCP.</p> <p>Additional park improvements at yet-to-be identified locations would also occur under the Proposed Action, as summarized in several County-adopted plans.</p> <p>The County would establish a network of conservation lands, increasing the amount of undeveloped open space accessible to recreational users. The exact amount of conservation land open to public access and available for compatible recreation would depend on the provisions of the long-term management plans for individual conservation sites, but it is expected public access to such lands would vary.</p> <p>Although the amount of land that would be publicly accessible is unknown, approximately 2,698 acres of new reserves would be established in at least five distinct portions of the County. Most new reserves would likely be open to nonmotorized recreation with limited closures for seasonal habitat management activities</p>	<p>Park or trail maintenance and improvement projects would be streamlined because the activities would be covered by the HCP, so pre-project site evaluations to detect occupancy of covered species would no longer be necessary.</p> <p>Park maintenance and improvements that have been deferred due to a likelihood of impacts to covered species would occur under the Proposed Action, including specific park improvement projects identified in the HCP.</p> <p>Additional park improvements at yet-to-be identified locations would also occur under the Proposed Action as summarized in several County-adopted plans.</p> <p>The potential for undeveloped land accessible to recreational use is expected to be greater under this alternative since approximately 3,109 acres of new reserves would be established under this alternative, compared to 2,698 under the Proposed Action.</p>

Table 1.5-1. Summary of Environmental Impacts (continued)

Environmental Element/ Resource Area	No Action Alternative	Proposed Action	Modified HCP Alternative
Socioeconomics	<p>The time and cost associated with screening for occupancy and avoiding take, combined with the lack of planning certainty, would continue to result in negative economic impacts on project proponents and owners of properties where ESA-listed species may be present. These impacts could constitute a significant negative outcome for the affected landowners and project proponents. At the broader scale, these negative impacts would not prevent development from meeting local or countywide growth needs.</p> <p>Negative socioeconomic impacts on individual landowners would occur throughout areas with habitat for ESA-listed species in Thurston County and would not disproportionately affect low-income or minority populations. As a result, the impacts described above would not be a significant negative outcome for environmental justice.</p>	<p>The Proposed Action would improve regulatory certainty and streamline the permitting process for project proponents. The Proposed Action would also create economic incentives for conservation and improve the predictability of development costs. The time, costs, and uncertainty associated with ESA compliance would be reduced, compared to the No Action Alternative, resolving the negative socioeconomic trends anticipated under that alternative. The Proposed Action would include the establishment of working lands easements with willing landowners, resulting in potential economic benefits for those landowners, such as revenue from sale of the easement and the ability to use the property's conservation benefits in agricultural product marketing.</p> <p>These positive economic effects would likely offset the incremental increase in County permit fees associated with HCP implementation. The HCP would have no adverse impacts on county revenues, employment, income, or the tax base. As such, the Proposed Action would result in no adverse socioeconomic changes in the population or community and social relationships or other economic impacts, and no significant adverse impacts would occur. By avoiding disproportionately negative impacts on low-income and minority communities, the Proposed Action would not have a negative outcome for environmental justice.</p>	<p>The socioeconomic effects of the Modified HCP Alternative would be similar to those of the Proposed Action, but the potential benefits would be slightly reduced for some agricultural landowners because working land easements would not be an option. No measurable changes in the population or community or interrelated social impacts are expected. As with the Proposed Action, this alternative would avoid disproportionately negative impacts on low-income and minority communities and, as such, would not have a negative outcome for environmental justice.</p>

Table 1.5-1. Summary of Environmental Impacts (continued)

Environmental Element/ Resource Area	No Action Alternative	Proposed Action	Modified HCP Alternative
Aesthetics, Light, and Glare	Implementation of activities conducted, permitted, or authorized by the County would modify the visual character of the landscape and would contribute to increased light and glare near developed areas.	<p>Implementation of covered activities would modify the visual character of the landscape and would contribute to increased light and glare near developed areas.</p> <p>The establishment of conservation sites under this alternative, with consistency in landform, vegetation, and land use; would contribute to the long-term maintenance of a higher-quality visual landscape compared to the No Action Alternative.</p>	<p>Implementation of covered activities would modify the visual character of the landscape and would contribute to increased light and glare near developed areas.</p> <p>The establishment of new reserves under this alternative, with consistency in landform, vegetation, and land use, would contribute to the long-term maintenance of a higher-quality visual landscape compared to the No Action Alternative. Because mitigation under this alternative would be limited to new reserves, this alternative would maintain slightly fewer blocks of land in an undeveloped condition compared to the Proposed Action.</p>
Historic and Cultural Resources	Under the No Action Alternative, County-permitted development projects and County infrastructure activities would comply with state regulations and the NHPA, where appropriate, resulting in no substantial change to the condition status of historic or cultural resources.	As under the No Action Alternative, Thurston County implements robust procedures to identify, avoid, and mitigate impacts to historic and cultural resources. Under the Proposed Action, USFWS would work with the County and state SHPO to ensure the local procedures also meet NHPA procedural expectations. Therefore, similar to the No Action Alternative, the Proposed Action would not result in significant adverse effects on historic and cultural resources. The Proposed Action would support existing environmental trends that reflect community engagement to protect historic and cultural resources.	As under the No Action Alternative, Thurston County implements robust procedures to identify, avoid, and mitigate impacts to historic and cultural resources. As with the Proposed Action, agencies would ensure that NHPA procedural expectations are met when development is proposed. The Modified HCP Alternative, therefore, would not result in significant adverse effects on historic and cultural resources and would support existing environmental trends that reflect community engagement to protect historic and cultural resources.

Table 1.5-1. Summary of Environmental Impacts (continued)

Environmental Element/ Resource Area	No Action Alternative	Proposed Action	Modified HCP Alternative
Transportation	<p>The majority of transportation maintenance and capital projects would be implemented only if impacts to ESA-listed species in the HCP can be avoided or allowed under the 4(d) special rule for Mazama pocket gophers.</p> <p>Though minimal, impact avoidance may compel reductions in the scope or delay implementation of some transportation projects, potentially resulting in minor increases in traffic where infrastructure expansion is needed to meet growing transportation demands.</p>	Covered activities, such as transportation capital projects, transportation maintenance, and work in right-of-way, would benefit from expedited permitting.	Covered activities, such as transportation capital projects, transportation maintenance, and work in right-of-way, would benefit from expedited permitting.
Public Services and Utilities	Extension of public services would be implemented only if impacts to ESA-listed species in the HCP can be avoided, allowed under the 4(d) special rule for Mazama pocket gophers, or allowed through the individual ITP for Puget Sound Energy service lines.	Covered activities, such as construction of new rural fire stations and expansion, upgrades, and construction of new schools, would benefit from expedited permitting.	Covered activities, such as construction of new rural fire stations and expansion, upgrades, and construction of new schools, would benefit from expedited permitting.

1.6 Areas of Controversy and Uncertainty, Issues to be Resolved

Consistent with the requirements for a SEPA EIS summary section (WAC 197-11-440(4)) and NEPA requirements at 40 CFR § 1502.21, this section discusses significant areas of controversy and uncertainty and/or issues to be resolved. Through the EIS process, other significant issues are identified and addressed within the individual resource analyses that follow, including impact avoidance and minimization, as well as mitigation. Discussions in this subsection address areas of controversy and uncertainty that apply to the proposal as a whole and that remain after evaluating the proposal through its individual environmental elements.

There is additional uncertainty within the permit areas as to the extent to which land use changes and other regional trends may be expected to affect the proposed covered species adversely or beneficially, both in terms of habitat availability and population size, especially as related to the Mazama pocket gopher subspecies. The ultimate locations of projects associated with covered activities also result in uncertainty within the permit area. The proposed Thurston County HCP has been developed to fully offset the impacts of the taking on covered species resulting from County-permitted development activities and County infrastructure activities. With regard to SEPA, extent or significance of the potential adverse impacts reflects some uncertainty because of the unpredictability of covered species habitat quality, distribution over space and time, and the uncertainty about where and when individual covered activities would occur. To ensure the expected outcomes in light of these uncertainties, the HCP and this EIS consider habitat surrogates to describe the degree and intensity of impacts. USFWS has found these to be a reliable and measurable indicators of outcomes for the covered species. Therefore, with regard to NEPA, these uncertainties are not significant or controversial.

Conservation planning under the Thurston County HCP is based on predictions of the environmental aspects governing species population stability and threats coupled with monitoring, adaptive management, and funding assurances. Inherent scientific uncertainty remains as a result of species dynamics that remain outside of the control of the HCP. To provide regulatory certainty, USFWS and the County must make certain assumptions about the proposed covered species based on the best information available.

The No Action Alternative, as defined for purposes of analysis in this EIS, is considered the most predictable condition, given considerable uncertainty about what actions landowners may take in the absence of the Proposed Action over the next 30 years. Uncertainty, however, remains as to the type, timing, and magnitude of development, as well as development patterns that would actually occur in Thurston County without implementation of the proposed Thurston County HCP.

2. PROPOSED ACTION AND ALTERNATIVES

Under SEPA and NEPA, the County and USFWS are required to analyze the environmental impacts of a proposed action and to consider all reasonable alternatives, including no action. The action under consideration for this analysis is the issuance by USFWS of an ITP for certain activities conducted, permitted, or authorized by the County, followed by implementation of the HCP and its conservation program, including minimization measures for covered activities and mitigation measures to fully offset the impacts of the taking on covered species.

This chapter describes and compares the Proposed Action and the alternatives evaluated in this EIS, including the No Action Alternative. The subsections below describe the alternatives analyzed in detail, present a comparison of the components that make up the alternatives, and identify the alternatives considered but eliminated from detailed analysis.

2.1 Alternatives Considered for Analysis

Analyses in this EIS address impacts that would arise from the following three alternatives, which are described in greater detail below:

- **No Action Alternative:** The County would not apply for, and USFWS would not issue, a Section 10(a)(1)(B) permit for incidental take (i.e., an ITP) of ESA-listed species in Thurston County. The County would not implement the Thurston County HCP, and projects that would result in unauthorized take of ESA-listed species would not proceed.
- **Proposed Action:** USFWS would issue the requested ITP, authorizing the incidental take of six species/subspecies that rely on prairie habitats throughout the county or on wetland/riparian habitat in the Black River watershed. Activities detailed in the HCP would be eligible for incidental take coverage through County-issued certificates of inclusion under the ITP. The County would implement the Thurston County HCP, including its conservation program with minimization measures for each group of covered activities and mitigation measures to fully offset the impacts of the taking on covered species. To ensure achievement of the HCP's biological goals, the HCP would include funding assurances for mitigation and for monitoring and adaptive management programs.
- **Modified HCP Alternative:** USFWS would issue an ITP, authorizing take of the same species by the same activities as under the Proposed Action. The County would implement a modified HCP under which mitigation would occur only on new reserves that would be restored and maintained to conserve covered species on high-quality habitat. All other elements of the HCP and conservation program would be identical to the Proposed Action. This alternative explores whether the HCP could be modified to provide higher conservation value to covered species by acquiring new habitat reserves and managing them to achieve the highest habitat quality. Conservation easements would not be executed on working agricultural lands and enhancement of existing conservation reserves would not be part of the mitigation strategy. Under this Alternative, fewer acres of new conserved habitat may be needed to fully offset the impacts of the taking to covered species.

Additional alternatives considered for analysis address different covered species, covered activities, conservation approaches, and permit durations. These alternatives are discussed in Section 2.2.

The following subsections identify the essential elements of the alternatives, emphasizing each alternative's approach to authorizing and mitigating take of ESA-listed species. First, the elements

common to all alternatives described in Section 2.1.1. Sections 2.1.2 through 2.1.4 describe the individual alternatives. The descriptions of the action alternatives also identify the species and activities that would be covered by the HCP.

Residential development represents a major component of the activities that would occur under any of the alternatives. For this reason, the alternative descriptions also discuss how each alternative's approach to ESA compliance might influence the rate of development. These discussions are grounded in the assumption that, after 30 years, buildout of residential-zoned properties is projected to be near, but not to exceed, 70 percent of capacity (within current zoning allowances). See Section 2.1.1.4 for the underlying basis for this assumption.

2.1.1 Elements Common to All Alternatives

This subsection identifies actions that would take place under any of the alternatives, including No Action. This subsection also identifies the area where the alternatives would be implemented. Key features of the alternatives that are pertinent to the analyses in this EIS are described in the subsections that follow. Discussions in Chapter 3 identify the study area for each element of the environment.

2.1.1.1 Activities Conducted, Permitted, or Authorized by Thurston County

The Thurston County Community Planning and Economic Development Department issues permits or approvals for a wide range of activities, and other departments (e.g., Public Works) carry out many other activities that have the potential to affect ESA-listed species. Table 2.1-1 briefly describes activities conducted, permitted, or authorized by the County. It also identifies the frequency with which each activity typically occurs, the extent of the area where the activity may occur, and the duration and intensity (degree) of the activity's effects on habitats that support ESA-listed species. Emphasis is given to the activities that would be affected by the implementation of the HCP conservation program under the action alternatives. These activities are described in greater detail in HCP Section 3.1, Covered Activities.

Under any of the alternatives, the County would continue to permit development and redevelopment that meet regulatory requirements to achieve growth needs. The County would also continue to maintain infrastructure as practicable.

Table 2.1-1. Activities Conducted, Permitted, or Authorized by Thurston County

Activity	Description	Frequency	Extent ¹	Duration and Intensity (Degree) of Effect
Residential development	Site-built dwellings and manufactured homes	Permanent	On residential tax lots ² anywhere in permit area	Year-round Complete habitat loss at the parcel or sub-parcel scale, up to 70 percent of current zoning capacity
Development of accessory structures	Structures ranging from small garden sheds to full-size barns or garages/workshops	Permanent	On residential tax lots developed before issuance of ITP, anywhere in permit area	Year-round Complete habitat loss; approx. 0.2 acre per structure

Table 2.1-1. Activities Conducted, Permitted, or Authorized by Thurston County (continued)

Activity	Description	Frequency	Extent ¹	Duration and Intensity (Degree) of Effect
Installation, repair, or alteration of septic systems	Placement of septic systems outside development envelope; repair or alteration of septic systems; removal of above- or below-ground home heating oil tanks	Temporary	On residential tax lots anywhere in permit area	Year-round Soil disturbance and replacement; approx. 2,500 square feet per septic system and 150 square feet per oil tank
Commercial and industrial development	Construction of business facilities for retail shopping, offices, restaurants, barber/beauty shops, veterinary clinics and hospitals, laundry, dry cleaning, motels, greenhouses, service stations, car washes, automotive and mechanical sales, auction yards, community centers, recreational uses, churches, libraries, museums, schools, and other public facilities, research and development facilities, factories, warehousing, wholesale, processing, storage, fabrication, printing, and other commercial or industrial uses	Permanent	Commercial and Industrial tax lots anywhere in permit area	Year-round Complete habitat loss at the parcel scale
Public service facility construction	Construction of rural schools and fire stations	Permanent	Specific sites identified by school districts; unspecified locations for fire stations	Year-round Complete habitat loss—approx. 140 acres total
Transportation capital projects	Construction of new roads, widening of existing roads, improvements of existing roads, bridge and culvert installation or replacement	Permanent	Location-specific	Year-round Complete habitat loss on 150% of the area specified for transportation projects in the 20-year Capital Facilities Plan
Transportation maintenance and other work within County-owned road rights-of-way	Vegetation maintenance, open drainage maintenance (ditching), existing guardrail maintenance, sign installation, enclosed drainage system maintenance, bridge maintenance, beaver-dam management, watercourse and stream maintenance	Typically temporary, but removes habitat components	Road rights-of-way throughout Thurston County	Varies – once per year to once per 30 years
Landfill and solid waste management	Expansion of two recycling centers; solid waste cleanup and remediation; construction of two new solid waste facilities	Permanent	Various sites throughout permit area	Year-round Complete habitat loss; approx. 55 acres total

Table 2.1-1. Activities Conducted, Permitted, or Authorized by Thurston County (continued)

Activity	Description	Frequency	Extent ¹	Duration and Intensity (Degree) of Effect
Water resources management	Conveyance upgrades; installation or repair of runoff treatment facilities; installation or repair of flow control facilities; installation of water and sewer lines; installation of groundwater wells	Permanent	Various sites throughout permit area	Year-round Complete habitat loss on 150% of the area specified for water resources projects in the 20-year Capital Facilities Plan
County parks, trails, and land management	County parks, trails, and land management, including construction of new trail	Permanent (extremely frequent maintenance treated as permanent impact)	County trail system and County parks	Year-round Complete habitat loss

Source: Sections 3.1 and 4.4 of the Thurston County HCP

¹ "Permit area" refers to the area in which Thurston County has jurisdiction and where covered activities and resulting take would occur.

² Residential development may also occur on portions of some parcels zoned for other uses (e.g., agricultural).

2.1.1.2 ESA Background

Under any of the alternatives, some take could occur legally for certain actions that are covered under a special rule (called the 4(d) rule) for Mazama pocket gophers, projects that are required to undergo ESA Section 7 consultation, and projects that secure individual ITPs, as described below. For this analysis, unplanned future actions, such as the issuance of future individual ITPs, are not reasonably foreseeable; as such, analyses in this EIS do not address these actions.

In 2014, USFWS promulgated a special rule under the authority of ESA Section 4(d), allowing certain activities to take place in habitat for Mazama pocket gophers on nonfederal lands (79 FR 19759, April 9, 2014) without incidental take authorization. These activities include the following:

- Agricultural activities that do not disturb the soil surface, such as haying, baling, and some orchard or berry plant management activities
- Crop management activities (e.g., planting, harvest, fertilization, harrowing, tilling) that do not involve soil disturbance more than 12 inches below the surface
- Deep tillage, occurring between September 1 and February 28, no more often than once every 10 years
- Management of noxious weeds and invasive plants through mowing, herbicide and fungicide application, fumigation, or burning
- Grazing
- Maintenance of livestock management facilities such as corrals, sheds, and other ranch outbuildings
- Repair and maintenance of unimproved agricultural roads
- Routine maintenance or construction of fencing, garden plots, or play equipment

- Construction and placement of dog kennels, carports, or storage sheds smaller than 120 square feet
- Routine management, repair, and maintenance of runways, roads, and taxiways at Olympia Airport
- Routine maintenance activities within road and highway rights-of-way (e.g., mowing, mechanical removal of noxious weeds or invasive plants, selective application of herbicides for removal of noxious weeds or invasive plants).

The take exemptions in the 4(d) rule apply only to Mazama pocket gophers and their habitat. If suitable habitat for other ESA-listed species is present at a site where one of the above-listed activities is proposed, the take prohibitions of ESA Section 9 may apply. Analyses in this EIS do not address the potential effects of projects covered under the 4(d) rule that are not included under covered activities.

If a proposed project has federal involvement (e.g., funding or permitting), ESA compliance, including the possible authorization of take, would be accomplished through the Section 7 consultation process. ESA Section 7(a)(2) requires all federal agencies to consult with USFWS (and, where applicable, the National Marine Fisheries Service) to ensure any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the adverse modification or destruction of designated critical habitat. For example, if a project requires a permit from the U.S. Army Corps of Engineers for placing fill in a wetland, and if that project has the potential to affect ESA-listed species or their habitat, then the U.S. Army Corps of Engineers is required to undertake Section 7 consultation. If the project may adversely affect ESA-listed species without jeopardizing the continued existence of the species, then USFWS may authorize incidental take. Analyses in this EIS do not address the potential effects of projects subject to Section 7 consultation.

Finally, proponents of projects that may adversely affect ESA-listed species have the option of preparing an HCP and applying for an individual ITP from USFWS, as Thurston County has done. Nine ITPs have been issued for site-specific development projects in the range of the Olympia, Tenino, and Yelm pocket gophers, and one has been issued for programmatic utility maintenance. Issuance of an individual ITP would require a NEPA review separate from this one. We cannot predict the type, location, or effects of future HCPs and ITPs that may be developed over a 30-year period and, therefore, cannot include them in this analysis. As such, analyses in this EIS do not address the potential effects of projects covered under individual ITPs, nor does the EIS address the potential effects of HCPs developed in support of such ITPs. Analyses in this EIS do not address the potential effects of projects implemented under individual ITPs. For this analysis, we assume projects implemented under the No Action Alternative would avoid prohibited take of ESA-listed species.

2.1.1.3 Affected Environment

This section summarizes the extent of the affected environment for this EIS. Relevant information about the location, extent, environmental trends, and planned actions related to each resource is provided in the descriptions of the affected environment for each resource area in Chapter 3. Those subsections tier off of the broader overview of the affected environment provided here.

Under the action alternatives, USFWS would issue an ITP authorizing incidental take of covered species by covered activities in areas where Thurston County has jurisdiction. This area, encompassing 412,228 acres, includes those portions of the county that are outside the limits of incorporated cities and that are not tribal lands or lands under federal control.

For some elements of the environment, effects of the alternatives may extend beyond the areas where the County has jurisdiction. For example, a project implemented on a private parcel may change the

quality of the visual landscape perceived by viewers in nearby areas, regardless of jurisdictional boundaries. Individual discussions in Chapter 3 of this EIS identify the areas where the alternatives could affect each element of the human environment under consideration.

2.1.1.4 Buildout to Accommodate Population Growth

Under any of the alternatives, the population of Thurston County will continue to grow, and parcels zoned for residential uses will continue to be developed or redeveloped to accommodate the increasing number of residents in the county within the limits of local, state, and federal law. Under the GMA (RCW 36.70A), the County has an obligation to permit proposals for development that are consistent with the County's Comprehensive Plan, critical areas regulations, and other statutory and regulatory requirements. Statutes and regulations pertinent to each resource area evaluated in this EIS are identified in Chapter 3.

Analyses in the HCP and this EIS are based on the County's projection that buildout of residential-zoned parcels in the County's jurisdiction will not exceed 70 percent (within current zoning allowances) over the 30-year period of the requested ITP (Thurston County 2020f). This information is reflected in the HCP by incorporating projections from the Thurston County buildable lands report (TRPC 2020a). That report considered population growth, job growth, and other data, as appropriate, to project supply and demand related to buildout of lands zoned for residential, commercial, and industrial uses. The projections were calibrated by jurisdiction and zoning category, and they considered the areas of modeled habitat for listed or covered species (TRPC 2020a).

Commensurate public infrastructure will be built and maintained to support population growth, public services, and public safety, and existing infrastructure will require maintenance. Such public infrastructure is also considered in the HCP and in the Thurston County buildable lands analysis (TRPC 2020a). Over the 30-year period analyzed in this EIS, the total amount of County-permitted development activity and County infrastructure activity is expected to be the same under the action alternatives or the No Action Alternative, but the locations of development would differ based on which alternative is selected.

The County reflected this information in the HCP to project the amount of covered activities and their impacts on covered species, and the same expected level of buildout equally informs the No Action Alternative. Buildout to reach 70 percent of current zoning capacity will occur in and away from modeled habitat under any alternative. The locations of individual development actions would be influenced by the implementation of take avoidance (under the No Action Alternative) or take authorization (under the action alternatives), as analyzed in this EIS. While 70 percent of current zoning is the projected level of buildout common to all alternatives, zoning is dynamic and some changes are expected, consistent with foreseeable development trends described above. However, changes in zoning are not expected to change the total level of buildout or result in different site-specific impacts. As such, potential zoning changes are not critical to this analysis. Throughout this EIS, where we refer to County buildout, we are incorporating the buildout assumptions described here. It is important to note that full buildout of the County jurisdiction is not expected or analyzed, and that only a portion of County development will occur in habitat for listed or covered species.

Because these activities would occur under any alternative, many actions and outcomes are common to all reasonable alternatives. This EIS considers the effects of the proposed HCP's measures to minimize and fully offset the impacts of the taking on covered species, along with the effects of implementing HCP-covered activities, and how those actions and outcomes would vary among the reasonable alternatives to the proposed HCP. As explained further in the introduction to Chapter 3, the patterns of

residential buildout and County infrastructure activities may differ under the alternatives, but the overall type and amount of these activities are expected to be similar.

2.1.2 No Action Alternative

Under the No Action Alternative, USFWS would not issue incidental take authorization to the County and the County would not implement the HCP. The County would continue to conduct, permit, and authorize activities (including those identified as proposed covered activities in Section 2.1.3) on a case-by-case basis in compliance with federal, state, and local requirements, including the Thurston County critical areas code. The County and individual project proponents would evaluate each project to ensure unauthorized take of ESA-listed species is avoided. To facilitate comparisons of the alternatives, the following subsections discuss covered species, covered activities, costs and funding, take authorization, take mitigation, and the anticipated rate of development under the No Action Alternative, even though several of these topics (e.g., covered species, covered activities, take mitigation) are not included in this alternative.

The No Action Alternative would not provide long-term certainty for growth and economic development in Thurston County, nor would it improve local control over covered activities. In addition, the No Action Alternative would not provide improved conservation through the implementation of coordinated mitigation in consolidated areas. As such, the No Action Alternative would not achieve the County's goals or meet the purpose and need for this EIS.

2.1.2.1 Covered Species

There would be no Thurston County HCP and USFWS would not issue an ITP to Thurston County under this alternative, meaning there would be no covered species.

2.1.2.2 Covered Activities

There would be no Thurston County HCP and USFWS would not issue an ITP to Thurston County under this alternative, meaning there would be no covered activities. Without take authorization, activities identified as covered activities under the Proposed Action would occur only if take can be avoided (unless take is allowed through another avenue, such as Section 7 consultation or the 4(d) rule for *Mazama* pocket gophers).

2.1.2.3 Costs and Funding

Under the No Action Alternative, the County would not manage a network of conservation lands and would not implement or monitor a conservation program, so the County would not establish funding mechanisms to serve these purposes. The County and project proponents would bear the costs of evaluating individual projects in habitat for ESA-listed species to identify the risk of prohibited take. The cost of evaluating lands and projects would vary by project, and those costs would be borne by individual project proponents.

2.1.2.4 Take Authorization

Under the No Action Alternative, there would be no countywide ITP, and the County and the public would continue to be responsible for avoiding impacts to ESA-listed species. Development and infrastructure maintenance projects that are otherwise legal for meeting ongoing growth demands would proceed where unauthorized impacts to ESA-listed species can be avoided.

The County would continue to address the potential take of ESA-listed species through the critical areas review process for individual building development permit requests and for County infrastructure activities. If existing information indicates that prairie, oak, or wetland/riparian habitat or species (including ESA-listed species) may be present at a proposed project site, the County's existing critical areas regulations would require site visits to assess the presence or absence of regulated species and habitats. Current County procedures rely on trained biologists to screen project sites for ESA-listed species occupancy before County-permitted or County-authorized activities can be conducted in modeled habitat for ESA-listed species. For example, before issuing building development permits on properties that contain or are within 300 feet of soils mapped as suitable for *Mazama* pocket gophers or that are within 600 feet of documented *Mazama* pocket gopher locations, the County would continue to require *Mazama* pocket gopher occupancy evaluations. Landowners and the County would continue to implement USFWS-recommended procedures to review projects and project sites for species occupancy (Thurston County 2020b).

The County would not conduct activities or issue permits for activities that would have unauthorized impacts on ESA-listed species. If evidence of ESA-listed species is found at a proposed project site, the project proponent would withdraw the application or modify the project to avoid impacts on ESA-listed species. As described in Section 2.1.1.2, analyses in this EIS assume projects with unauthorized impacts on ESA-listed species would not proceed. If a proposed project has sufficient federal involvement (e.g., funding or permitting), ESA compliance, including the possible authorization of take, would be accomplished through the Section 7 consultation process. As discussed in Section 2.1.1.2, the effects of potential future federal actions, such as the issuance of individual ITPs, are not analyzed in this EIS. As a result, analyses in this EIS are based on the assumption that take of ESA-listed species would be avoided under this alternative.

2.1.2.5 Mitigation for Take

The No Action Alternative would not include a comprehensive program for mitigating take of ESA-listed species. There would be no countywide program to offset impacts to those species. As a result, the County would not manage a network of conservation lands, and there would be no overarching coordination of the timing and location of conservation for ESA-listed species.

Under the No Action Alternative, the County would continue to require avoidance of impacts to sites where the presence of ESA-listed species has been detected and individual ESA compliance (e.g., Section 7 consultation) has not been completed. Activities conducted or permitted by the County would occur only in areas where impacts to ESA-listed species can be avoided, or where there is a federal nexus necessitating Section 7 consultation.

As noted in the discussion of take authorization, the impacts of projects covered by individual ITPs (and of the mitigation measures included in individual HCPs) would be evaluated in under separate NEPA and ESA Section 7 reviews because such individual projects are not reasonably foreseeable.

The County would continue to require mitigation for impacts to critical areas under the County's CAO. However, in the absence of an ITP issued to the County, mitigation under the County's CAO does not ensure compliance with ESA and does not impart take authorization.

2.1.2.6 Rate of Development

Under the No Action Alternative, County-permitted development projects and County infrastructure activities would continue to occur, where practicable, to meet the needs of ongoing population growth. An emphasis on work outside of habitat for ESA-listed species would impact planning for construction and infrastructure maintenance. For projects that are or may be in habitat for ESA-listed species, the

County and project proponents would continue existing procedures to evaluate sites for species occupancy during or immediately before County permit decisions. As a result, the pace of development would likely continue to be slower in areas with habitat for ESA-listed species, such as grasslands and prairies on soils suitable for *Mazama* pocket gopher, compared to other areas (e.g., extensively disturbed sites or areas with dense forest cover).

These procedures for avoiding unauthorized take of ESA-listed species may influence the pace of development in the County. On sites in modeled habitat for ESA-listed species, occupancy screening would delay individual projects consistent with existing trends. The County implements screening procedures to review projects for occupancy by ESA-listed species; the procedures reflect the best available science related to each species, so methods vary by species. Detection of *Mazama* pocket gopher occupancy is evaluated through multiple site visits by trained biologists during certain times of year, visually scanning for mounds. By contrast, the locations of Taylor's checkerspot butterfly are known and are not widespread in the permit area. Oregon spotted frog occupancy is typically confirmed through egg mass surveys or assumed to occur in habitats that are connected and accessible to areas with documented occupancy. Screening for Oregon vesper sparrow is not conducted because impacts to individuals are not currently prohibited by state or federal law.

Especially for individual projects in modeled habitat for the *Mazama* pocket gopher subspecies, occupancy screening can be a time-consuming process that slows individual project planning. Some project proponents may be able to accommodate delays in proposed projects or modify projects to avoid impacts; projects where ESA-listed species do occur would not proceed (see Section 2.1.1.2, ESA Background, for exceptions not analyzed here). As a result, the implementation of projects in habitat for ESA-listed species would not be streamlined under the No Action Alternative.

2.1.3 Proposed Action

Under the Proposed Action, USFWS would issue the requested ITP to Thurston County, authorizing limited levels of incidental take of covered species by the covered activities specified in the HCP. To obtain ITP coverage, the County would fully implement the Thurston County HCP with its conservation program that includes avoidance, minimization, and mitigation measures to fully offset the impacts of the taking on covered species. The conservation program would also include an adaptive management program to ensure biological goals are met. The term of the ITP would be 30 years (this 30-year period is called the permit term, and it serves as the temporal basis for the impact analyses in this EIS). As under the No Action Alternative, the County would continue to conduct, permit, and authorize activities in compliance with federal, state, and local requirements, including the Thurston County critical areas code. In contrast to the No Action Alternative, the Proposed Action would not require take avoidance for covered species or site-specific screening for occupancy by ESA-listed species because the HCP provides streamlined procedures for activities in modeled habitat.

The HCP would establish a network of conservation lands permanently managed and monitored for the preservation and protection of covered species. This network would include new reserves, existing reserves, and conservation easements on working lands. In implementing the HCP, the County would fund and ensure permanent management, monitoring, and adaptive management on conservation lands. New permanent reserves are included to expand, restore, or enhance the condition of the covered species habitat. In addition, the Proposed Action includes protection of working lands and habitat-enhancement activities on existing reserves where permanent management assurances for covered species do not already exist. New and existing reserves would be managed for high-quality habitat for covered species, and moderate-quality habitat for covered species would be maintained on working agricultural lands. These measures are included to provide improved habitat stability for the covered species.

The Proposed Action is the agency-preferred alternative because it provides a practical approach for durable conservation outcomes in the permit area. The priorities for conservation lands detailed in the HCP align with landscape-level priorities for prairie habitat protection (USFWS 2015b, 2017), such as prioritizing protection of the largest remaining habitat patches. Other conservation partners, such as land trusts, state agencies, and other federal agencies have similar conservation goals in the South Puget Prairie ecosystem. In addition, the priorities support local land use goals, ranging from streamlined development to long-term support for working lands and habitat restoration. By streamlining development and supporting maintenance of working lands where compatible with landowner goals and species needs, the Proposed Action would address the County's goals of regulatory certainty and improved conservation.

In contrast to the No Action Alternative, the Proposed Action would streamline and improve certainty to projects in modeled habitat for covered species commensurate with projects in non-habitat, alleviating the emphasis on development in non-habitat or unoccupied areas that characterizes the No Action Alternative.

The following subsections discuss covered species, covered activities, costs and funding, take authorization, take mitigation, and the anticipated rate of development under the Proposed Action.

2.1.3.1 Covered Species

Under the Proposed Action, USFWS would issue an ITP to the County, authorizing incidental take of covered species by covered activities (see below). The species proposed for ITP coverage are listed in Table 1.4-1. These species were selected for ITP coverage because (1) they are currently listed under the ESA or they are reasonably likely to become listed during the permit term, (2) they may be affected by the proposed covered activities, and (3) there is enough information about them to plan effectively and evaluate the impacts of HCP implementation. If other species are added to the list of threatened or endangered species under the ESA during the permit term, the County would either implement take avoidance procedures, pursue an amendment to the HCP, or prepare a new HCP using the best available science.

2.1.3.2 Covered Activities

The activities proposed for coverage under the ITP include a variety of actions and projects for which the County issues permits or authorizations or that it otherwise carries out, with limitations detailed in the HCP. Proposed covered activities would include County-permitted construction (including related infrastructure and utility construction) activities and infrastructure maintenance work conducted by or for the County. These activities are described briefly in Section 2.1.1.1 and in greater detail in Chapter 3 of the HCP (Thurston County 2020f). The covered activities would not include mining or mining authorizations, such as County-permitted extraction of minerals, oil, gas, or other earth materials.

Activities described in the HCP that meet the following criteria, and that are otherwise lawful, would be eligible for coverage under the ITP (Thurston County 2020f):

- Sufficient take coverage is available under the ITP issued to Thurston County for the proposed activity.
- The activity does not preclude achieving the biological goal and conservation objectives of the Thurston County HCP.
- The activity is an action under the jurisdiction of the County or is authorized by the County.

- The activity occurs within the HCP permit area.
- The activity occurs within the term of the ITP.
- The activity's physical extent, frequency, and resulting impacts to covered species can be reliably projected or estimated.
- Mitigation to fully offset the impacts of the taking on covered species for the activity is delivered in advance of the impacts.
- The impacts from the activity can be monitored, documented, and reported.
- The effectiveness of Best Management Practices (BMPs) can be monitored, documented, and reported.

2.1.3.3 Costs and Funding

Under the Proposed Action, the County would ensure funding to permanently maintain the HCP conservation program and for plan administration, as described in Chapter 8 of the HCP. The HCP conservation program would be funded through County funding (via the Conservation Futures Program), combined with mitigation fees paid by project proponents (see the discussion of procedures in Section 2.1.3.4, Take Authorization). As described in HCP Chapter 7 and HCP Appendix H, mitigation fee amounts for individual projects would be based on the type and extent of impacts. The total cost of program administration, conservation land acquisition, and conservation land restoration, enhancement, management, and maintenance would be approximately \$4 million per year during the 30-year permit term. Costs would include endowments to permanently fund management, monitoring, and adaptive management on the conservation lands. Chapter 8 of the HCP details the anticipated costs. Section 3.8 of this EIS analyzes the socioeconomic impact of the anticipated costs and funding under the Proposed Action.

2.1.3.4 Take Authorization

Under the Proposed Action, USFWS would issue the requested ITP to the County authorizing take of the covered species, provided appropriate minimization and mitigation measures are implemented. During the permit term, the County would issue certificates of inclusion to individual project proponents as binding agreements to comply with the terms of the ITP.

Authorized take under the Proposed Action would result from implementation of the covered activities where habitat for covered species is present. The proposed limits for take are identified for each covered species and detailed below. These limits are associated with the anticipated amount and extent of covered activities that would overlap with habitat for covered species. The HCP includes projections for the extent of covered activities, monitoring procedures to ensure take accounting remains accurate, and limits for covered activities. These limits are associated with the expectation that the buildout of residential-zoned properties in unincorporated Thurston County will not exceed 70 percent of the 2019 zoning capacity and limits set in the HCP for other specific covered activities.

Financial assurances and conservation lands would be incrementally added to the permanent conservation network. The pace of these conservation actions would be managed to stay ahead of the impacts of covered activities on covered species. As part of the HCP's stay-ahead provisions, financial assurances for and acquisition of properties or easements for sufficient conservation lands would be required before covered activities are conducted. Financial assurances for and performance of permanent monitoring and management of those lands would also be required before covered

activities are conducted. Under this alternative, take authorization would streamline County permitting and decision-making processes.

Defining Take

The HCP conservation program specifies measures for avoiding, minimizing, and mitigating for impacts to covered species and their habitat. The conservation program also includes an adaptive management program to ensure biological goals are met. In developing the HCP, the County assumed that the primary impact to covered species would be direct injury or mortality to individuals through habitat loss and disturbance, and that habitat loss would negatively impact the ability of individuals of the covered species to forage, feed, and reproduce. The HCP also addresses indirect effects on covered species. Habitats for the covered species are used in the HCP and this EIS as surrogates for impacts to individuals and are defined as follows (see Section 3.4, Plants and Animals, for more detailed descriptions):

- Habitat for the three subspecies of *Mazama* pocket gopher (Yelm pocket gopher, Olympia pocket gopher, and Tenino pocket gopher) is defined by soil types suitable for the species (79 FR 19760, April 9, 2015; USFWS 2015b). These areas include sites where *Mazama* pocket gophers have been documented, as well as un-surveyed areas with suitable soils and vegetation (grasslands and prairies). Pocket gopher habitat in the permit area is divided into five service areas—three for the Yelm pocket gopher and one each for the Olympia pocket gopher and the Tenino pocket gopher (USFWS 2015b, 2017). The modeled extent of *Mazama* pocket gopher habitat in the permit area is 67,987 acres, including 52,047 acres in the range of the Yelm subspecies, 9,271 in the range of the Olympia subspecies, and 6,669 in the range of the Tenino subspecies.
- Habitat for Taylor’s checkerspot butterfly is defined according to proximity to known locations. The species requires a narrow suite of host plants, has limited dispersal ability, and is sensitive to land use, so widespread occupancy is not expected. The habitat is estimated to cover approximately 2,424 acres in the permit area.
- Habitat for the Oregon vesper sparrow is defined according to proximity to known locations, coupled with habitat size and context, and is estimated to cover 6,064 acres within the permit area.
- Oregon spotted frog habitat in the permit area is found only in riparian and wetland areas associated with the Black River drainage. Habitat requirements for Oregon spotted frogs vary with life stage and season but generally include wetland habitats connected by an aquatic network of streams, ditches, rivers, and flooded wetlands. To support preparation of the HCP, the County developed a suitable-habitat overlay (the OSF Habitat Screen) containing the known and likely occupied areas for the species in Thurston County. The OSF Habitat Screen includes wetland core areas (defined as suitable wetlands in the Black River drainage within 300 meters of mapped streams), designated critical habitat, and adjoining areas that are within 100 meters of streams. The Oregon Spotted Frog Washington Working Group reviewed the results of this modeling exercise and recommended some adjustments (e.g., adding areas where Oregon spotted frogs have been detected or where remote sensing did not identify potentially suitable habitat). The resulting OSF Habitat Screen identifies approximately 39,500 acres of potential habitat in the permit area.

The ITP would also authorize limited impacts to designated critical habitat for five of the covered species/subspecies (Oregon spotted frog, Taylor’s checkerspot butterfly, and the three *Mazama* pocket gopher subspecies). The HCP would include measures to ensure each unit of designated critical habitat

remains functional by permanently protecting areas within designated critical habitat to offset impacts of the taking on covered species that occur in that unit of critical habitat.

Before making an ITP decision, USFWS will conduct an intra-agency consultation regarding the anticipated effects of the Thurston County HCP on ESA-listed species and critical habitat. Upon completion of this consultation process, USFWS would produce a biological opinion. The biological opinion would document the likelihood of jeopardizing the continued existence of any ESA-listed species or of adversely modifying designated critical habitat for any such species. The USFWS may only issue an ITP if it determines that the taking will not appreciably reduce the likelihood of survival and recovery of the covered species in the wild. Additionally, pursuant to Section 7 of the ESA, USFWS must determine that designated critical habitat will not be destroyed or adversely modified.

Quantifying Take

The projected quantity of unavoidable incidental take of the proposed covered species from the proposed covered activities during the 30-year permit term is based on development projections from the Thurston Regional Planning Council (TRPC) combined with the County's analysis of past and future projects and permits. Impacts on covered species are treated as debits and are quantified as functional acres. Functional acres are defined for each covered species in the HCP (Chapters 4 and 7 and Appendix H), to provide standardized ratings of the extent of impacts and the quality of impacted habitat. Under the Proposed Action, a total limit of approximately 5,200 functional acres of habitat impact (debts), across all covered species, would be covered under the ITP (Table 2.1-2).

Table 2.1-2. Projected Impacts to Covered Species During the HCP Permit Term (Functional Acres)

Covered Activity	Species ¹							Total
	OPG	TPG	YPG	MPG subtotal ²	TCB	OVS	OSF	
New Residential Development	306	101	2,431	2,838	5	9	235	3,087
Added Accessory Structures	33	24	151	208	3	7	26	244
Septic Extension or Repair, Heating Oil Tank Decommission	17	13	81	111	2	4	42	159
Commercial/ Industrial	212	9	399	620	0	0	44	664
Public Service Facilities	5	1	105	111	1	2	0	114
Management	1	1	31	33	0	1	1	35
Transportation Projects	18	7	94	119	2	0	127	248
Transportation Maintenance and Work in Right-of-Way	31	17	405	453	1	0	115	569
Water Resources Management	9	7	44	60	1	2	3	66
County Parks, Trails, and Land Management	1	0	4	5	2	0	25	32
Total Functional Acres	632	178	3,747	4,556	16	25	618	5,216

Adapted from HCP Tables 4.4 and 4.5. Note that some bottom-line totals in this table do not equal the sums of values above due to rounding. Total values for projected impacts are consistent with the corresponding values in the HCP.

¹ OPG = Olympia pocket gopher; TPG = Tenino pocket gopher; YPG = Yelm pocket gopher; MPG = Mazama pocket gopher; TCB = Taylor's checkerspot butterfly; OVS = Oregon vesper sparrow; OSF = Oregon spotted frog.

² MPG subtotal is the sum of impact values for OPG, TPG, and YPG.

Surrogates can be used to express the anticipated level of incidental take, provided three criteria are met: (1) measuring take impacts to an ESA-listed species is not practical; (2) a link is established between the effects of the action on the surrogate and take of the listed species; and (3) a clear standard is set for determining when the level of anticipated take based on the surrogate has been exceeded (50 CFR 402.14(i)(1)(i)).

Each of the covered species is cryptic, small-bodied, or otherwise difficult to detect, so measuring take in terms of numbers of individual is not practical. Chapter 4 of the HCP provides a detailed explanation of why the habitat surrogates establish clear linkages between the effects of the action on habitat and the take of the covered species. By using measurable habitat surrogates for take, the Proposed Action includes clear standards for determining the level of take authorized and incurred over time.

The HCP includes biological goals that are consistent with the best available scientific and commercial information. To provide assurance that the described outcomes for covered species would be achieved, the HCP also specifies measurable objectives, monitoring, adaptive management, and funding assurances to ensure achievement of the HCP's biological goals.

The biological goal of the HCP is to maintain viable populations of each of the covered species on conserved lands commensurate with and in advance of potentially unavoidable impacts from the covered activities. Objectives for achieving the biological goal include:

- Minimizing direct and indirect impacts to proposed covered species through application of BMPs.
- Acquiring reserve lands from willing sellers to secure, stabilize, and expand species strongholds.
- Securing permanent conservation easements with willing landowners to conserve, stabilize, and expand species distributions.
- Enhancing habitat for proposed covered species populations at existing reserves.

Procedures

Individual project proponents seeking incidental take coverage under the Thurston County HCP would be required to obtain a County permit for proposed covered activities and a certificate of inclusion under the ITP from the County (HCP Appendix J). The application would:

- Describe the proposed project and document that it is a covered activity.
- Identify and quantify impacts to the proposed covered species, following the process described in HCP Appendix H, Credit-Debit Methodology.
- Set forth the requirements of the parties, including mitigation commitments (following the process described in HCP Appendix H) and costs.

The applicant would then secure the certificate of inclusion by paying a mitigation fee or dedicating land to conservation (provided those lands are eligible for dedication; see HCP Section 7.6). The mitigation fee would be based on the type and extent of impacts.

Where practicable, project designs or implementation plans would likely be voluntarily adjusted to avoid taking or minimize impacts of the taking on covered species. Unavoidable habitat impacts would be mitigated through the management of a permanent network of conservation lands, as described in the HCP and in this EIS. The County would monitor and annually report on the amount and extent of covered activities, the amount of functional acres impacted for each covered species, and the amount of the authorized take realized to date, along with other monitoring and reporting requirements detailed in the HCP.

2.1.3.5 Mitigation for Take

Under the Proposed Action, Thurston County would establish and permanently maintain a network of conservation lands occupied by the covered species. Mitigation for unavoidable impacts of covered activities on covered species would be accomplished through establishing new reserves on lands purchased from willing sellers, maintaining and enhancing existing habitat reserves, and working with willing landowners to establish conservation easements on working lands. These three types of conservation lands would be the primary components of the conservation strategy for offsetting impacts to ESA-listed species.

The County would use a system of credits (defined as functional acres—see the discussion of take quantification in Section 2.1.3.4) to quantify mitigation benefits to covered species. The County would also require advance mitigation. This means that, before mitigation credits could be released, mitigation sites would have to meet HCP performance standards for covered species occupancy and habitat quality, meet habitat-quality goals, and have sufficient funds dedicated for permanent management. The HCP includes a commitment to keep mitigation ahead of the impacts of the taking by ensuring that, at any time, the total amount of credits for protected habitat (as measured in functional acres) meets or exceeds the total amount of debits for habitat impacts (also measured in functional acres). The HCP conservation program (HCP Chapter 5) includes a mitigation approach for each covered species, permanently providing protection for the same number of functional acres as would be impacted by covered activities.

By standardizing impact and mitigation calculations using habitat surrogates that relate to impacts of the taking, the HCP would simplify the processes of determining mitigation debits for individual projects and allocating existing mitigation to fully offset the impacts of the taking. This method would eliminate the current requirement to evaluate habitat conditions or species on individual project sites. The simplified credit-debit calculations in the HCP establishes a repeatable and predictable method for determining habitat impacts and offsets, streamlining the process of issuing individual building permits.

The intent of the conservation program is to fully offset the impacts of the taking on covered species that result from the covered activities. This would be achieved by protecting covered species on working lands (e.g., pastures, farms) and new habitat reserves as well as through enhancement of existing reserves. Conservation would be focused in Reserve Priority Areas (RPAs), where possible.

RPAs are places identified by federal and state biologists as being the most important for, and the most likely to support, the long-term conservation and recovery of the *Mazama* pocket gopher subspecies. Identification of RPAs was based on subspecies ranges, genetics, occupancy, soil types, current land use, conservation biology and recovery needs, and landscape context (USFWS 2015b; USFWS 2017; Stinson 2020). Priority areas for conservation are also identified for the other covered species.

Reserves are assemblages of permanently protected parcels, composed of core areas and connecting corridors that are of sufficient collective size and connectivity to enable the covered species survival in numbers adequate for long-term sustainability. Reserves would commonly be managed for high-quality habitat for covered species.

Working-land easements are areas secured via permanent conservation easements with willing landowners to conserve, stabilize, and expand species distributions, and to demonstrate land uses compatible with the covered species. Habitat on each permanently protected parcel, whether a reserve or a working-land easement, would be maintained with funding for long-term management and monitoring. Working-land easements would commonly be managed for medium-quality habitat for covered species. For this analysis, working-land easements are considered to be conservation

easements on working agricultural lands. It is understood that any such easements would be legally bound through the conservation easement process as defined in the HCP.

The Proposed Action would incorporate active management to restore prairies. Restoration and maintenance of habitat at mitigation sites would include removing invasive species (through mowing, burning, pesticide application, or other methods), planting native species, and maintaining sites to ensure habitat suitability over the long term. These mitigation actions would be covered under the 4(d) rule for Mazama pocket gophers (see Section 2.1.1.2).

The conservation program includes both minimization (i.e., implementation of BMPs) and mitigation. The mitigation element focuses on the protection, restoration, and management of habitat through acquiring reserve lands, securing conservation easements, and enhancing habitat for meeting the biological goal. The HCP mitigation is designed to fully offset the impacts of the taking on covered species that result from covered activities. Mitigation includes management plans governing mitigation site management for covered species, public education and outreach, and habitat enhancement funding and implementation. As part of the HCP conservation program, the County would coordinate the identification, establishment, and long-term management of conservation sites, encouraging the implementation of mitigation in consolidated areas rather than at small, scattered sites. This conservation network would include lands that are currently zoned for residential, industrial, or other uses with willing landowners. Table 2.1-3 (which is a copy of HCP Table 7.7) provides an estimate of lands to be engaged under the HCP. The HCP also includes additional eligibility criteria for mitigation lands to ensure their size, management, and other attributes are compatible with the expected outcomes.

Table 2.1-3. Projected Conservation Lands Engaged (Acres)

Conservation Land Type	Service Areas ¹					Habitats ²			Total
	YPG N	YPG E	YPG S	OPG	TPG	TCB (in YPG S)	OVS (in YPG E)	OSF	
New Reserves	744	400	516	346	73	0	0	618	2,698
Working Lands Easements	0	163	210	0	28	0	31	0	433
Enhanced Existing Reserves	0	130	168	0	0	40	0	0	339
TOTAL	744	693	895	346	101	40	31	618	3,469

Adapted from HCP Table 7.7. Note that some bottom-line totals in this table do not equal the sums of values above due to rounding. Total values for projected conservation lands engaged are consistent with the corresponding values in the HCP.

¹ YPG N = Yelm pocket gopher north; YPG E = Yelm pocket gopher east; YPG S = Yelm pocket gopher south; OPG = Olympia pocket gopher; TPG = Tenino pocket gopher.

² TCB = Taylor's checkerspot butterfly; OVS = Oregon vesper sparrow; OSF = Oregon spotted frog.

In implementing the HCP's biological objectives, mitigation credit would be generated in the conservation program to fully offset the effects on covered species of the taking by covered activities. Species-specific mitigation guidelines within the conservation lands system developed as part of the conservation program are included in the HCP, along with a comprehensive credit-debit system in which credit release would be governed by species status and performance standards for habitat quality and function. The conservation lands projections included in Table 2.1-3 were developed based on assumptions of desired future conditions and credit yields of the conservation program; credits can be incrementally released as higher habitat targets are achieved on individual sites.

The underlying conservation lands projections and the credit-debit system would be adaptively managed through the permit term. Thurston County would implement an adaptive management program and would follow management practices that contribute to meeting the biological goal and associated objectives of the HCP. The conservation program, monitoring and adaptive management, and implementation plan, including the credit-debit methodologies are described in detail in the HCP (Thurston County 2020f). All conservation lands would be permanently protected and maintained.

For the duration of the ITP, the County would provide the staff and resources necessary to fully implement the HCP conservation program. The Thurston County Board of Commissioners would be responsible for implementing the HCP conservation program. An HCP implementation team, staffed by the County's HCP coordinator, would advise the Board. The provisions of the HCP would be enforced through implementing procedures incorporated into the Thurston County Code (TCC). USFWS would also retain ITP enforcement authority.

A key element of the Thurston County HCP would be the monitoring and adaptive management program. The program is described in Chapter 6 of the HCP and briefly summarized here. The program would be designed to provide the information needed for the following:

- Confirming that the governing body (Thurston County) is in compliance with the terms of the ITP and HCP.
- Documenting progress toward meeting the HCP's biological goal and objectives.
- Demonstrating that the HCP's conservation program is effective in minimizing and mitigating unavoidable impacts.
- Identifying any needs for changes to improve the HCP conservation program.

The adaptive management program in the HCP would operate at both the program scale and at the site scale. Adaptive management would identify key uncertainties, monitoring attributes, triggers, and corrective actions (see Tables 6.1 and 6.2 in the HCP). The adaptive management program would also provide information to validate the assumptions underlying the HCP's biological goal and objectives.

Example sources of program-level uncertainty that would be addressed in the adaptive management program include the availability of lands to be engaged the conservation lands system within RPAs, as well as the effectiveness of the County's outreach in promoting impact avoidance measures. Site-level adaptive management on conservation lands would address uncertainty related to the response of covered species and associated habitat to restoration, enhancement, management, and maintenance activities. Through adaptive management, land managers would evaluate the status of covered species and habitat, adjusting management practices as needed to restore habitat quality and function. In response to effectiveness monitoring data, the County would work with the HCP implementation team to recommend and approve minor adaptive adjustments to site management plans, acquisition criteria, monitoring frequency, or other factors. Any such changes would be described in HCP annual reports.

For all proposed projects, regardless of potential adverse effects on ESA-listed species or critical habitat, participation in the HCP would streamline the process and timeline of securing permits and take authorization. The HCP would improve the predictability of the permitting process for developers and residents, eliminating uncertainty about ESA compliance requirements. Pursuant to 50 CFR 17.22, and as described in Section 7.13 of the HCP, the ITP would also include a "no surprises" assurance, limiting the ability of the federal government to require additional commitments or place restrictions on land uses beyond those agreed to in the HCP and ITP.

2.1.3.6 Rate of Development

As discussed in Section 2.1.1.4, Buildout to Accommodate Population Growth, the total amount of development and infrastructure maintenance during the 30-year analysis period is likely to be equivalent under the Proposed Action as compared to the No Action Alternative because the anticipated amount of population growth is independent of the federal action. By facilitating the ESA compliance process, the HCP may lead to a faster pace of project implementation on individual project sites.

Streamlining the ESA compliance process probably would not happen immediately, however. During the first few months after ITP issuance, the timeline for project reviews could be similar to what is currently experienced and what would continue to be experienced under the No Action Alternative. There may be a ramp-up period while the County establishes implementing procedures in the TCC and establishes mitigation credits. Once the implementation framework has been set up, the permit process for individual projects would be expedited, compared to the No Action Alternative.

For this reason, the amount of development activity that occurs under the Proposed Action may be similar to that expected under the No Action Alternative. The amount may be slightly more or less, but buildout of residential-zoned properties is not expected to exceed 70 percent of current zoning capacity over the 30-year permit term.

2.1.4 Alternative Action: Modified HCP with Mitigation on New Reserves Only

Under the Modified HCP Alternative, USFWS would issue an ITP for implementation of the proposed HCP with terms and conditions requiring all mitigation to be provided on new habitat reserves. The Modified HCP Alternative is designed to evaluate whether additional conservation value is practicable through alternative mitigation measures while meeting the purpose and need for the federal action. The permit area, permit term, covered species, covered activities, and nearly all other elements of the HCP would be identical to those described for the Proposed Action. Similar to the Proposed Action, the Modified HCP Alternative would streamline covered activities in modeled habitat. The Modified HCP Alternative would incorporate the same minimization measures for covered species and would use the available information about species occupancy, habitat quality, and site location to quantify impacts on covered species resulting from covered activities. Mitigation to fully offset the impacts of the taking on covered species would be provided on new reserves at a pace to stay ahead of the impacts. The key difference between the Modified HCP Alternative and the Proposed Action would be in the network of conservation lands, as described below.

Similar to the Proposed Action, the Modified HCP Alternative would streamline development, thereby addressing the County's goals of regulatory certainty and improved conservation. By evaluating an alternative approach to mitigating take of covered species from covered activities, the Modified HCP Alternative supports USFWS' purpose and need.

2.1.4.1 Covered Species

The same species proposed for ITP coverage under the Proposed Action would be covered under this alternative (see Table 1.4-1).

2.1.4.2 Covered Activities

The same activities proposed for ITP coverage under the Proposed Action would be covered under this alternative (see Section 2.1.2.2), and the criteria for coverage would be the same.

2.1.4.3 Cost and Funding

The Modified HCP Alternative would implement the same funding mechanism as the Proposed Action. The HCP conservation program would be funded through the County's Conservation Futures Program and mitigation fees paid by project proponents. The cost of the Modified HCP Alternative would likely be higher than under the Proposed Action. Acquisition of new reserves coupled with their long-term management for high-quality habitat, would be costlier than enhancing existing reserves or establishing conservation easements that maintain land uses. The number of expected development projects would be similar (see Section 2.1.1.4, Buildout to Accommodate Population Growth). Higher fees would likely be required to fund the higher costs of the conservation program under this alternative compared to the Proposed Action.

2.1.4.4 Take Authorization

The processes and responsibilities for quantifying take (i.e., debits calculated as functional acres) and applying for coverage under the ITP would be the same under the Modified HCP Alternative as under the Proposed Action. These are described in Section 2.1.3.4, Take Authorization.

2.1.4.5 Mitigation for Take

Under the Modified HCP Alternative, mitigation for unavoidable impacts to covered species would be provided only on new reserves. Working-land easements and enhancement of existing reserves would not be part of the mitigation strategy. As with the Proposed Action, the County and project proponents would be responsible for financial assurances for permanent monitoring and management of each new reserve before conducting additional covered activities.

Only a narrow range of land uses—primarily, those compatible with or directed at habitat restoration or maintenance—would be allowed on conservation lands. The only conservation lands under this alternative would be new reserves, which would be restored to the highest practical habitat targets and permanently maintained to conserve occupied habitat for the covered species. As a result, all conservation lands would be managed to stringent habitat targets (e.g., “high-quality native prairie” for Taylor’s checkerspot butterfly and Oregon vesper sparrow, as described in HCP Table 4-2), and the network of conservation lands would not include any working-land easements.

To fully offset the impacts of the taking through the protection of high-quality habitat, the total number of mitigation acres needed would be less than the Proposed Action (see the introduction to Chapter 3 for further discussion). The same number of functional acres of occupied habitat would be protected under both action alternatives.

2.1.4.6 Rate of Development

As with the Proposed Action, the Modified HCP Alternative would facilitate the ESA compliance process, reducing permitting timeline for many projects, although this benefit probably would not be felt immediately. In fact, the time lag between HCP implementation and permit streamlining would likely be greater under this alternative than under the Proposed Action. Because fewer sites would be available for mitigation, the process of establishing mitigation credits may take longer. Over the 30-year permit term, the ability to secure mitigation sites might control the pace at which Thurston County generates mitigation credits and, by extension, the pace at which covered activities can occur. Nevertheless, by streamlining permit reviews and reducing uncertainty for development planning, this alternative would provide benefits, compared to the No Action Alternative.

2.1.5 Key Differences Among Alternatives

This section summarizes key differences among the alternatives. Under either of the action alternatives, USFWS would issue an ITP to Thurston County, authorizing limited effects on the proposed covered species by the covered activities (i.e., incidental take), and the County would implement the Thurston County HCP's avoidance and minimization measures. The action alternatives vary in the composition of lands for the HCP mitigation program. No ITP would be issued under the No Action Alternative. Without an ITP, some individual projects may not occur or may be delayed under the No Action Alternative where take cannot be avoided. In contrast to the No Action Alternative, the action alternatives would alleviate requirements for take avoidance and site-specific screening because the HCP provides streamlined procedures for activities in modeled habitat. The action alternatives do not differ from one another in the lists of species and activities covered by the ITP.

Key differences between the alternatives are evident both at the broad (countywide) scale and at the scale of individual sites impacted by County-permitted development or County infrastructure activities:

- At the countywide scale, the major differences between No Action and action alternatives are the locations of individual projects, combined with the inclusion of a consolidated and coordinated conservation program under the action alternatives, combined with streamlined local decision-making and improved regulatory certainty. As a result, the County's maintenance and development goals would likely be met under the action alternatives. While development goals at the county scale may be met under each alternative, the No Action Alternative may challenge maintenance of some County infrastructure.
- At the scale of individual projects, the benefits of the action alternatives over the No Action Alternative would include the streamlining of projects in modeled habitat for ESA-listed species, combined with increased certainty about whether and how the projects would proceed. Streamlining would be achieved under the action alternatives because screening for occupancy by ESA-listed species would not be required in modeled habitat, as it would under the No Action Alternative. Improved planning certainty would be achieved because take that would have to be avoided under the No Action Alternative would instead be authorized and mitigated under the action alternatives.
- The key difference between the two action alternatives is the network of conservation lands that would be used for mitigation of unavoidable adverse impacts from the covered activities on the covered species and their habitat. Under the Proposed Action, sites employed for mitigation would include new reserves, working agricultural lands, and existing reserves. Under the Modified HCP Alternative, mitigation for unavoidable impacts to covered species would be provided only on new reserves. By focusing all mitigation on new reserves, which provide the greatest ecological lift per acre to the covered species, the Modified HCP would result in a slightly smaller network of conservation lands. The action alternatives do not differ from one another in the lists of species and activities covered by the ITP.

2.2 Other Alternatives Considered

Discussions in this subsection address submitted alternatives, information, and analyses received through public comment during the public scoping periods, along with all alternatives identified by USFWS and the County. These public comments were used to inform the alternatives considered in detail (described in Section 2.1, above) as well as the other alternatives considered (described here), using the best available information and analyses in consideration of the public comments. All alternatives, information, and analyses submitted during scoping are summarized in Appendix E.

The County and USFWS completed scoping for the Thurston County HCP in 2013. After revising the HCP, the County and USFWS conducted scoping again in 2020. The County and USFWS considered public comments from the 2013 and 2020 public scoping processes in determining the scope of reasonable alternatives to address in this EIS. Through this process, the County and USFWS evaluated several potential alternatives and determined that they would not broaden the range of reasonable alternatives or would not meet the purpose and need described in Chapter 1. These alternatives, which were excluded from further study in this EIS, fall into four broad categories: (1) variants in the list of species covered in the HCP, (2) adjustments to the lands or entities to which the HCP would apply, (3) alternative conservation strategies, and (4) variants in the duration of the ITP.

2.2.1 Alternatives for Covered Species Lists

The County and USFWS evaluated several alternatives that would modify the list of species covered under the HCP, including options with more or fewer species (Table 2.2-1). Species unlikely to be present in areas where the County conducts, permits, or authorizes activities (e.g., marbled murrelet, northern spotted owl) were not considered for inclusion. Similarly, ESA-listed fish were not considered for inclusion as covered species because projects with the potential to affect those species would likely require federal funding, permits, or authorization, necessitating consultation under ESA Section 7.

Table 2.2-1. Species Considered for HCP Coverage

Species	Species Status ¹		Covered Species Alternatives ²		
	Federal	State	All State and Federally Listed Species	Listed, Sensitive, and Candidate Species	Fewer Covered Species
Mammals					
Olympia pocket gopher	T	T	●	●	●
Tenino pocket gopher	T	T	●	●	●
Yelm pocket gopher	T	T	●	●	●
Western gray squirrel		T	●	●	
Amphibians					
Oregon spotted frog	T	E	●	●	*
Western toad		C		●	
Reptiles					
Western pond turtle	UR	E	●	●	
Birds					
Streaked horned lark	T	E	●	●	
Oregon vesper sparrow	UR	E		●	
Slender-billed white-breasted nuthatch		C		●	
Invertebrates					
Taylor's checkerspot butterfly	E	E	●	●	*
Mardon skipper		E	●	●	
Puget blue butterfly		C		●	
Valley silverspot butterfly		C		●	
Plants					
Golden paintbrush	T	T	●	●	
Water howellia	T	T	●	●	
Rose checkermallow		T	●	●	

Table 2.3-1. Species Considered for HCP Coverage (continued)

Species	Species Status ¹		Covered Species Alternatives ²		
	Federal	State	All State and Federally Listed Species	Listed, Sensitive, and Candidate Species	Fewer Covered Species
White-top aster		S		●	
Small-flowered trillium		S		●	
Puget balsamroot		UR		●	

¹ T=Threatened; E=Endangered; C=Candidate; UR=Under Review.

² ● indicates species that would be covered under a given alternative; * indicates species for which coverage would vary under different scenarios.

Covering additional species in an HCP can provide additional conservation benefits and regulatory certainty, while also typically requiring additional conservation measures, monitoring, mitigation, and associated funding assurances. USFWS may consider coverage appropriate if sufficient information about the species is available to quantify and ensure outcomes. Applicants may consider covering more species appropriate if the additional regulatory certainty addresses a risk of unauthorized take of ESA-listed species during the full course of HCP implementation, or it complements other goals. These factors, along with the status of the species, the likely exposure to and impacts from covered activities, reasonable planning constraints, and public interest, were considered for each species listed in Table 2.2-1.

The following subsections identify alternatives that would have considered different lists of covered species.

2.2.1.1 All State and Federally Listed Species

Under this alternative, the species covered under the HCP would include all plant and animal species currently listed as endangered or threatened under the ESA, as well as those currently classified by the Washington Fish and Wildlife Commission as endangered (WAC 220-610-101) or threatened (WAC 220-200-100). ITP coverage could apply to species that could be negatively affected by the implementation of covered activities, provided the HCP meets Section 10 permit issuance criteria. Under this alternative, five of the six species identified as covered species under the Proposed Action would be covered under the HCP, along with another seven species (Table 2.2-1).

The take prohibitions of ESA Section 9 currently do not apply to six of these species (western gray squirrel, western pond turtle, Mardon skipper, and the three plant species). If any of these species are listed as threatened or endangered under the ESA during the permit term, HCP implementation could proceed uninterrupted under this alternative, and no amendment to the County's HCP would be expected.

The HCP would specify conservation actions and monitoring commitments commensurate with the scale of the impacts for each species. Compared to alternatives with shorter lists of covered species, this alternative would result in higher costs for implementing avoidance, minimization, and mitigation measures, creating greater financial burdens for program implementation. Because this alternative would provide ITP coverage for species to which ESA take prohibitions do not apply and that are not expected to be listed in the foreseeable future, these additional financial burdens could be unnecessary. Additionally, USFWS has no authority to require coverage of unlisted species. In addition, by failing to provide coverage for the Oregon vesper sparrow, which is currently under review to determine whether federal listing is warranted, this alternative would not meet the County's goals for regulatory certainty.

Under this alternative, the listing of additional species that may be affected by covered activities could cause the County to halt individual covered activities to avoid unauthorized take, seek a modification to

their HCP, or pursue an additional HCP. This alternative is not analyzed further because it does not fully meet the purpose and need when taking Thurston County's goals into account. Furthermore, the County did not include these species in the HCP and USFWS lacks legal authority to require an applicant to include anything other than ESA-listed species in the applicant's ITP request.

2.2.1.2 All Listed, Sensitive, and Candidate Species

Under this alternative, the species covered under the HCP would include all plant and animal species currently listed as endangered or threatened under the ESA; those currently classified by the Washington Fish and Wildlife Commission as endangered, threatened, or sensitive; and species designated by the Washington Department of Fish and Wildlife (WDFW) as candidates for state listing. As with the alternative described above, ITP coverage would apply to covered species that could be negatively affected by the implementation of covered activities, provided the HCP meets Section 10 permit issuance criteria. Under this alternative, all six species identified as covered species under the Proposed Action would be covered under the HCP, along with another 14 species (Table 2.2-1).

As with the alternative described above, the longer list of covered species would result in higher costs for implementing avoidance, minimization, and mitigation measures. If species are not added to the ESA list, the associated financial burdens for program implementation could be unnecessary.

Managing mitigation for a wider array of species in the prairie ecosystem would require new information on the habitat management practices necessary to ensure outcomes for each species, likely slowing and complicating the conservation efforts for ESA-listed species. Under this alternative, the No Surprises coverage provided by the HCP would either accept risks from uncertainties for species with little available information or demand a complex adaptive management program to address uncertainties. Thurston County did not request ITP coverage for all listed, sensitive, and candidate species, and USFWS cannot compel it through terms and conditions on the requested ITP or through other authorities. USFWS determined that providing coverage to a larger list of unlisted species was not a reasonable alternative to the Proposed Action because USFWS does not have the authority to require coverage of unlisted species, the County did not propose ITP coverage for these species, and such an alternative would not meet the applicant's or USFWS' purpose and need.

2.2.1.3 Fewer Covered Species

Under this alternative, the HCP would cover fewer species than would be covered under the Proposed Action. The County and USFWS considered two scenarios.

Under one scenario, the HCP would cover only the ESA-listed animal species that are likely to be exposed to covered activities (i.e., reasonably certain to be taken by covered activities): the three subspecies of *Mazama* pocket gopher, Oregon spotted frog, and Taylor's checkerspot butterfly. The HCP would not cover the Oregon vesper sparrow, which is currently under review to determine whether federal listing is warranted.

Under the other scenario, the HCP would cover only the three subspecies of *Mazama* pocket gopher. The Olympia pocket gopher, Tenino pocket gopher, and Yelm pocket gopher are the ESA-listed species with ranges that overlap the most activities under Thurston County jurisdiction.

Under either of these scenarios, the resulting HCP would address the conservation needs of covered species and improve the County's regulatory certainty, compared to the No Action Alternative. An ITP issued under this alternative would not cover activities that are likely to take non-covered ESA-listed species. The HCP conservation program would provide long-term monitoring and mitigation to offset impacts of the taking on covered species.

To ensure each covered species is maintained in the permit area, conservation actions would be substantially similar to those specified in the Proposed Action. However, slightly less conservation area would be expected under this alternative because impacts to fewer species would need to be offset. If any of the non-covered species are listed as threatened or endangered under the ESA during the permit term, these species would not be covered, and the County would implement take avoidance measures, similar to the current situation. In such an event, to maintain regulatory certainty, the County may request to amend the HCP and ITP or seek an additional ITP through a separate HCP.

Alternatives covering fewer species would not clearly meet USFWS's purpose and need, which acknowledges the County's goals for countywide regulatory certainty and improved outcomes for all species that would be covered under the Proposed Action. Because individuals of all species proposed as HCP-covered under the Proposed Action are likely to be taken by the County's activities, any alternative covering fewer species would not meet the County's goals for regulatory certainty.

Alternatives focused on covering fewer species are composed of a mixture of the No Action Alternative (i.e., no permit issuance for any species) and the Proposed Action (i.e., permit issuance for certain species). For this reason, alternatives covering fewer species would not broaden the range of reasonable alternatives. As a result, individual alternatives covering fewer species are not analyzed in detail in this EIS.

2.2.2 Alternatives Regarding Covered Lands and Entities

Part of the HCP-development process considers the lands that should be covered by an ITP and HCP. For a countywide plan such as the Thurston County HCP, this consideration revolves, in part, around the parties who may apply for take coverage under a coordinated ITP and HCP. In addition, HCP coverage for certain areas may reflect the types of activities expected in those areas and the potential for ESA-listed species to be exposed to the impacts of those activities. The following subsections describe alternatives that would have included different lands or entities under the HCP and ITP.

2.2.2.1 County-Owned Land or County Projects

Under this alternative, USFWS would issue an ITP for HCP implementation only on lands owned by Thurston County and/or for projects conducted by the County. Other landowners and project proponents in Thurston County would be required to avoid take of ESA-listed species or obtain take coverage through individual ITPs. In effect, limiting the covered lands in this way would limit the covered activities to County projects or the infrastructure development and maintenance that can occur on County-owned lands. For most County residents, this alternative would be the same as the No Action Alternative and would not provide regulatory certainty for development on private lands in County jurisdiction. In addition, this alternative would consist of elements considered for the Proposed Action (coverage for County actions on County-owned lands) and the No Action Alternative (lack of coverage for actions on private lands), and it does not broaden the range of alternatives considered. As such, this alternative neither meets the purpose and need nor meaningfully adds to the range of alternatives that could be considered.

2.2.2.2 County Jurisdiction Only Inside Urban Growth Areas

This alternative would consider ITP issuance for HCP implementation only for development in urban growth areas (UGAs), with the intent of concentrating development in already-fragmented areas. This alternative would include the same covered activities and covered species as the Proposed Action, with a smaller permit area. This alternative was recommended through public comment as a means to maintain the covered species away from urban areas and support higher-density development in or near urban areas. Because some of the species proposed for ITP coverage under the Proposed Action

(Olympia pocket gopher and Yelm pocket gopher, in particular) occur in the UGAs, impacts would be less than under the Proposed Action, but impacts would not be completely avoided. The conservation program for covered species would be commensurate with the amount of take authorized. Because the conservation program under this alternative would only offset impacts occurring in the UGAs, the conservation network would be smaller. As a result, the anticipated conservation benefit of concentrating development would not be realized for those species.

This alternative would not broaden the range of reasonable alternatives considered because it would consist of a combination of elements from the No Action Alternative (take avoidance outside UGAs) and the action alternatives (ITP coverage within the UGAs). In addition, this alternative would not meet the County's goal of obtaining the desired regulatory certainty for development or maintenance projects conducted, permitted, or authorized by the County in all areas where the County has jurisdiction. Finally, neither the County nor USFWS has the authority to direct all local development toward UGAs. Considering the complex overlay of existing and reasonable land uses, planning for public infrastructure, management of public safety, compliance with state and local growth management regulations, individual property rights, and the importance of local procedures for enabling public engagement, development density is more effectively managed through local zoning procedures, which are compatible with the range of alternatives addressed in detail in this EIS. For these reasons, the County and USFWS did not identify restricting the permit area to the UGAs as a meaningful alternative to the Proposed Action.

2.2.2.3 Coverage Throughout Thurston County, Including Incorporated Cities

This alternative would consider ITP issuance for HCP implementation throughout all non-federal lands in Thurston County. The ITP would cover the same activities and species as the Proposed Action, and the covered lands would extend beyond County jurisdiction to include the incorporated cities in Thurston County.

Recognizing that some parties in local cities may desire the benefits of the HCP, USFWS and the County explored opportunities for partnerships across municipalities. Thurston County does not have the authority to ensure HCP compliance in incorporated cities, beyond the actions conducted by the County. USFWS and Thurston County conducted outreach to city managers to identify willing partners, and they did not receive commitments for partnership in HCP implementation. Likewise, USFWS has not received ITP applications from other parties for the proposed HCP. Individual cities could choose to develop HCPs if they seek ITP coverage, and those plans may be similar to or different from the Proposed Action.

Taking these factors into consideration, extending the requested permit coverage to the incorporated cities in Thurston County is not a reasonable alternative to the Proposed Action.

2.2.2.4 Smaller Permit Area

Under this alternative, USFWS would issue an ITP covering a smaller permit area. Instead of the full 412,228-acre area where the County has jurisdiction, the permit area for this alternative would consist only of modeled habitat for covered species (approximately 115,000 acres, according to HCP Table 4.8). Compared to the Proposed Action, limiting the permit area to modeled habitat would not alter impacts to covered species in the modeled habitat because anticipated take of covered species under the Proposed Action would occur only in areas of modeled habitat. In addition, this alternative is entirely within the range of alternatives considered in detail, so detailed analysis would not yield additional information about impacts on the affected environment. Finally, this alternative would reduce the regulatory certainty afforded by the ITP in the event additional habitat areas are identified in the County's jurisdiction. Taking these factors into consideration, an alternative for a smaller permit area was not analyzed in detail.

2.2.3 Reduced Impact/Conservation Incentive Program Alternative

Under this alternative, the County would focus on enhancing habitat to support species recovery. To this end, the County would work with willing sellers to purchase fee-simple title and/or conservation easements on parcels with a high probability of supporting ESA-listed species (e.g., undeveloped, high-quality prairies and other sites with suitable habitat). The USFWS would not issue an ITP and the County would not authorize, permit, or conduct activities that may adversely affect ESA-listed species because the County would prioritize species recovery over other County planning objectives. On sites where a higher conservation value could be achieved, many otherwise legal projects would not proceed.

To support species recovery through collaboration with willing landowners, some form of financial incentive program would be necessary. Additional funds may be needed to support landowners whose otherwise legal projects are delayed or unachievable under this alternative. Neither USFWS nor Thurston County has funding sources to guarantee such incentives. The total extent of prairie habitat or listed-species habitat in Thurston County is not precisely known, but a simple comparison to the Proposed Action indicates that this approach would be expensive and lacks a related short- or long-term funding source. USFWS could contribute grant funding, as available, and the County could use some of their tax revenues from the Conservation Futures Program toward habitat acquisition.

Under this alternative, the County would not meet the development demands of a growing community. Substantial reductions in development and infrastructure maintenance would occur. Neither USFWS nor Thurston County has the authority to compel the highest conservation outcomes on private lands, or to prioritize species recovery over otherwise legal private land uses.

While some public commenters addressed the desire for a limitless conservation strategy and for replacing development with conservation, it is unreasonable to expect that whole-ecosystem conservation and listed-species recovery could be achieved by Thurston County alone without major new funding streams. At best, funds to acquire the necessary lands would take an inestimably long time to obtain, and there may not be enough willing sellers to achieve the desired conservation goals. Additionally, this alternative would not address USFWS's responsibility to respond to the ITP application Thurston County submitted, nor would it address the County's obligation to permit individual projects and proposals that are consistent with County code.

Taking these factors into consideration, a reduced-impact alternative in which the County prioritizes conservation is not a reasonable alternative to the Proposed Action.

2.2.4 Different Permit Duration

Under this alternative, the term of the ITP issued by USFWS would be shorter, to provide greater certainty for the covered species. USFWS policy discourages considering longer permit durations. USFWS considered the permit duration carefully and identified that multiple factors of the Proposed Action would make a shorter permit duration analytically inseparable from the Proposed Action. These factors include the biological goals, functional-acre metrics, and monitoring and adaptive management program. These elements work together to limit the risks to covered species under the Proposed Action.

Additionally, both action alternatives would include provisions for changed and unforeseen circumstances, to further ensure that expected outcomes for the species are maintained. Finally, because the action alternatives would be implemented incrementally over time, at approximately the same pace as the conservation lands are protected, a shorter permit duration would not be a meaningfully different alternative from the Proposed Action. Without a meaningful difference from the Proposed Action, this alternative would not add to the range of reasonable alternatives.

3. AFFECTED ENVIRONMENT, IMPACTS, AND MITIGATION MEASURES

This chapter describes the environmental elements (also referred to as environmental disciplines) that may be affected by the Proposed Action and alternatives. Discussions in this chapter also address the requirements of WAC 197-11-440 and 40 CFR 1502.16(a) by analyzing the environmental consequences or potential impacts to those environmental elements, including any adverse environmental effects that cannot be avoided. Existing authorities for additional mitigation and potential mitigation measures not already included in the Proposed Action or alternatives are also identified and discussed, per 40 CFR 1502.14(e).

This chapter is organized into 12 sections, one for each of the following elements of the environment:

- Earth Resources (includes geology and soils)
- Air Quality and Climate
- Water Resources (includes water movement, quality, quantity, runoff/absorption, groundwater, and public water supplies)
- Plants and Animals (includes habitat, unique species, and migration routes)
- Noise
- Land Use
- Recreation
- Socioeconomics and Environmental Justice
- Aesthetics, Light, and Glare
- Historic and Cultural Resources (includes archaeological, historic, cultural, and Indian trust resources)
- Transportation
- Public Services and Utilities

The 12 environmental disciplines are consistent with those identified in NEPA- and SEPA-specific guidance and use a common organization. Each section is divided into subsections to simplify and clarify the discussion, as described below.

Introduction: This subsection follows the discipline heading without a sub-heading and introduces the environmental discipline and the scope of the individual analysis, including the spatial boundaries of the analysis and rationale for choosing the boundaries. For all environmental disciplines, the time period for the analysis (i.e., the temporal boundary) is 30 years, which is consistent with the proposed duration of the Thurston County HCP. Outcomes may extend beyond 30 years, but the 30-year period fully explores the effects on the human environment. The study area (i.e., spatial boundary) for each environmental discipline describes the area where the effects would occur. The study area is typically synonymous with the permit area, which includes all lands for which the County has jurisdiction; however, the boundary can vary by discipline. For some elements of the environment, the study area includes all land within the Thurston County boundary, regardless of jurisdiction. This subsection also describes the approach for the discipline, including the regulatory framework, information sources, and any relevant assumptions. For some disciplines, the descriptions of the regulatory framework are extensive and are placed under a separate sub-heading for clarity.

Affected Environment: SEPA regulations require that the affected environment section of the EIS describe the existing environment that would be affected by the proposal. NEPA regulations found at 40 CFR 1502.15 are similar, requiring a description of the environment of the area(s) to be affected or created by the alternatives under consideration, including the environmental trends and planned actions in the area(s). The environmental trends in the affected environment represents the physical

conditions or environmental setting of the study area against which impacts or effects are evaluated, including relevant activities and regulations. Descriptions of the affected environment reflect current physical conditions of the study area and incorporate the impacts of reasonably foreseeable environmental trends and planned actions per SEPA and NEPA regulations (see Section 1.3, Approach to Analysis, for additional discussion). Current trends are described where applicable. Where specific planned actions have been identified, they are described.

Environmental Consequences: This subsection presents the analysis of impacts of the No Action Alternative and the two action alternatives for the 30-year time period under consideration, consistent with the proposed duration of the Thurston County HCP. Analyses evaluate the impacts of each alternative, inclusive of the proposed covered activities and HCP mitigation, minimization, and avoidance measures, on each resource discipline. Potential impacts to the affected environment are compared within the context developed for each element of the environment. The effects of each of the action alternatives (i.e., the Proposed Action and the Modified HCP Alternative) are compared to those of the No Action Alternative. Comparisons of effects address changes (adverse or beneficial) in conditions and trends that are identified in the description of the affected environment for each element of the environment as well as any planned actions or identifiable modifications to the current rate of change in the condition of a given environmental discipline.

No Action Alternative:

In the absence of an adopted countywide HCP, habitat occupied by ESA-listed species that could be affected by a proposed activity would be avoided under the No Action Alternative. Thurston County uses modeled habitat to identify sites where projects must be screened for occupancy by ESA-listed species. Modeled habitat area is based on documented species presence, preferred soil type, and known habitat components, among other values. Under the No Action Alternative, development and maintenance activities would occur in modeled habitat where screening for listed species does not detect occupancy, or where the activities are not restricted (e.g., agricultural activities allowed under a 4(d) special rule under ESA). For purposes of comparative analysis, the No Action Alternative considers the amount of avoided area in terms of the HCP's overall projected effects (HCP Table 4.8). Using that information, Table 3-1 (below) includes total estimated habitat area, projected percentage of affected habitat, and maximum area to be avoided for each species under the No Action Alternative. As discussed in Section 2.1.1.2, the effects of potential future federal actions, such as the issuance of individual ITPs or projects that undergo ESA Section 7 consultation, are not analyzed in this EIS. As a result, analyses in this EIS are based on the assumption that take of ESA-listed species would be avoided under this alternative.

Table 3-1. Take Avoidance Areas Under the No Action Alternative

Species ¹	Total Estimated Habitat Area (Acres)	% Habitat Affected by Covered Activities	Maximum Area Avoided to Prevent Take of ESA-Listed Species (Acres)
OPG	9,271	13.0%	1,210
TPG	6,669	6.3%	425
YPG	52,047	13.0%	6,821
TCB	2,424	22.8%	54
OVS	6,064	7.7%	93
OSF	39,493	1.4%	618

¹ OPG = Olympia pocket gopher; TPG = Tenino pocket gopher; YPG = Yelm pocket gopher; TCB = Taylor's checkerspot butterfly; OVS = Oregon vesper sparrow; OSF = Oregon spotted frog.

Action Alternatives:

The two action alternatives can be compared based on differences in the proposed conservation programs and subsequent credit yields derived from each conservation action. The conservation program for the Proposed Action is based on three types of conservation actions: creating new reserves, adopting working-land easements, and enhancing existing reserves. The conservation program for the Modified HCP Alternative includes conservation actions on new reserves only; working-land easements and enhancement of existing reserves would not be included. Table 3-2 details the projected impacts and the differences between the conservation programs for the two action alternatives.

Table 3-2. Impacts of the Action Alternatives on Covered Species, and Mitigation for Those Impacts

Species ¹	Action Alternatives Impacts (Acres)		Action Alternatives Mitigation (Acres)			
	Max Habitat Loss	Functional Acres*	Proposed Action ²			Modified HCP
			NR	WLE	ER	NR
OPG	1,210	632	346	0	0	346
TPG	425	178	73	28	0	98
YPG	6,821	3,747	1,660	373	298	2,047
TCB	54	16	0	0	40	20**
OVS	93	25	0	31	0	20**
Total Prairie Habitat Conservation Lands (Acres)			2,079	433	339	2,491
Total All Conservation Program Lands			2,851			
OSF	618	618	618	0	0	618
Total Wetland/Riparian (OSF) Habitat Conservation Lands (Acres)				618		618
Total Conservation Lands Engaged Through the HCP Conservation Program				3,469		3,109

Note that some bottom-line totals in this table do not equal the sums of values above due to rounding. Total values for projected conservation lands engaged are consistent with the corresponding values in the HCP.

¹ OPG = Olympia pocket gopher; TPG = Tenino pocket gopher; YPG = Yelm pocket gopher; MPG = Mazama pocket gopher; TCB = Taylor's checkerspot butterfly; OVS = Oregon vesper sparrow; OSF = Oregon spotted frog.

² NR = New Reserves; WLE = Working Lands Easements; ER = Existing Reserves

* Functional Acres = Impact Area (extent in acres) x Relative Habitat Value (Scale of 0 – 1)

** 20 Acre minimum functional habitat for new reserves for TCB, OVS; to occur at a single site (nearest RPA)

Per NEPA regulations at 1502.21, this EIS considers incomplete or unavailable information. There is some uncertainty about the location of covered activities. Covered development activities would be guided by local zoning. Current zoning maps and regulations are known, but the locations of projects that would be built under the alternatives are unavailable at this time and cannot be obtained. However, sufficient information about countywide trends and patterns of development are available for this EIS to project reasonably foreseeable significant adverse impacts on the human environment under each alternative at a broader scale, without relying on the precise location of future project sites within the permit area. Siting of individual projects will be determined over the 30-year analysis period, pursuant to existing local, state, and federal procedures and requirements. This site-specific information would not substantively change our analysis or conclusions in Chapter 3 and is, therefore, not essential to our decision among alternatives.

Avoidance, Minimization, and Mitigation Measures: These sections identify appropriate mitigation measures as they result to the resource being analyzed. Under any of the alternatives, measures for

avoiding, minimizing, and mitigating adverse effects on the resource areas addressed in this EIS would be implemented, as appropriate, in accordance with existing regulatory requirements, including the County's comprehensive plan and critical areas regulations; for the action alternatives, resource-specific mitigation measures from the HCP are also discussed. In accordance with NEPA (40 CFR § 1502.16), we consider appropriate mitigation measures not already included in the proposed action or alternatives. SEPA (WAC 197-11-440(6)) requires a disclosure of mitigation procedures and activities proposed for adoption by Thurston County. To address these responsibilities together, mitigation measures (inclusive of avoidance and minimization) provided under existing authorities and those proposed under the HCP are described in each analysis, as those measures relate to the environmental discipline under consideration. Mitigation measures proposed under the HCP are designed to offset the impacts of the taking on covered species. To the degree these or other measures would also have a mitigating effect to other resources, the authorities that make such measures appropriate are described.

USFWS and the County evaluated the potential for the action alternatives to result in unavoidable adverse effects on any of the environmental disciplines addressed in this EIS. USFWS and the County also evaluated potential major irreversible and irretrievable commitments of resources, as required by 40 CFR 1502.16 (a)(4). Irreversible commitments are decisions affecting non-renewable resources or commitments that cannot be reversed. The term 'irreversible' describes the loss of future options and applies to the impacts of using nonrenewable resources or resources that are renewable only over a long period of time. Irretrievable commitments are those that are lost for a period of time. Conversion of currently vacant lands to other uses (e.g., residential or commercial uses) may be construed as such a commitment. However, such conversion would occur only where otherwise legal, and it would occur to a similar degree under any of the alternatives, including the No Action Alternative. As such, neither of the action alternatives would result in the irreversible or irretrievable commitment of resources that would not otherwise have occurred under the No Action Alternative, and this topic is not addressed further in this EIS.

3.1 Earth Resources – Geology and Soils

The study area for earth resources (including geology, soils, and geologic hazards) is the Thurston HCP permit area as described in Section 1.3. Potential impacts to earth resources have been assessed by reviewing published reports on geology and soils studies in the study area. These studies and reports include publicly available federal and state data from the Natural Resource Conservation Service (NRCS) and the Washington State Department of Natural Resources (DNR), as well as published literature that establishes the geologic history of the Thurston County region.

Thurston County has adopted regulations that protect critical areas and human health and safety as required under GMA (RCW 36.70A). TCC Chapter 24 includes minimum standards for geologic hazards and critical areas that identify, classify, and designate protection measures for conditions such as soil erosion. These standards would apply to all projects in Thurston County under all alternatives. Soil movement of 50 cubic yards or more requires a construction permit under TCC Chapter 14. Construction activities that disturb one or more acres of soil must obtain coverage under the National Pollution Discharge Elimination System (NPDES) Construction Stormwater General Permit administered by the Washington State Department of Ecology (Ecology). To be eligible for coverage under this general permit, projects must implement erosion control measures and a temporary erosion and sediment control plan.

3.1.1 Affected Environment

This subsection describes existing conditions and reasonably foreseeable environmental trends pertinent to earth resources in the study area. Aside from individual County-permitted development activities and periodic updates to the Thurston County Comprehensive Plan (TCCP, discussed in Section 3.6), consistent with reasonably foreseeable environmental trends, no other planned actions specific to this environment discipline have been identified.

3.1.1.1 Geology

The terrain of the County and its associated geology are highly variable, ranging from sea-level, salt-water-influenced coastal lowlands at the edge of the Puget Sound in the north county to broad plains and rolling hills in the central county to the Cascade Foothills to the southeast to Tertiary-age sedimentary mountains in the west and south. Elevations range from sea level along the Puget Sound to over 3,000 feet in the mountains in the northwest and southeast areas of the county.

Most of the surficial geology in Thurston County is composed of relatively young, Quaternary-age glacial and more recent flood sediments. From about 10,000 to 100,000 years ago, the ground surface in the northeastern majority of the county was covered by the southernmost extent of a continental glacier that carved the Puget Sound and covered the northern edge of the United States. The Puget Sound Trough is bordered to the west by the Olympic Peninsula (Olympic Range) and to the east by the Cascade Range. The southern end of the county was not covered by the glacier but is still covered by sandy and gravelly glacial outwash flood deposits in low areas between uplands composed of much older bedrock. Most of the geology (and resultant soils) in the glacially influenced portion of Thurston County is a result of deposition and erosion and advance and retreat of the Vashon glaciation. As the Vashon glacier receded, it left behind coarse, well-drained, sandy, glacial outwash deposits, which in some areas developed into prairie ecosystems (Noble and Wallace 1966). Atop the geologic processes creating relatively flat, well-drained soils, prairies developed where naturally occurring or anthropogenic fires sustained the early-seral grasslands. Without disturbances, such as fires, forests would eventually grow on these soils. Most of the prairie ecosystems are located in the north-central, glaciated portions of the county and in the glacial outwash flood areas south of the glacial terminus (Figure 3.1-1).

Wetland resources in the county tend to be closely associated with geologic landforms along the primary river and stream systems. The Black River system drains southwest through the western county to merge with the Chehalis River then flows to the Pacific Ocean. This basin includes the Beaver Creek subbasin, which, together with the main channel of the Black River system, is federally designated habitat for the Oregon spotted frog. Other significant river systems include the Deschutes and Nisqually rivers, which flow to the Puget Sound, and the Skookumchuck River and Scatter Creek that flow into the Chehalis River and to the Pacific Ocean. Details about these watersheds, including current conditions and 303(d) listed impaired waters are discussed in Section 3.3.1, Water Resources.

The geology of Thurston County influences land form and land cover. Prairie landforms in Thurston County are found in the central lowland plains, formed from glacial outwash sediments. Some prairies formed historically on an unusual landform called Mima Mounds, which are found across the central county and also in other regions across the United States, as well as on other continents. Mima Mounds are large circular mounds of sandy-gravelly sediments that are about 10 to 30 feet diameter, about 4 to 8 feet tall, and set about 20 to 30 feet apart, covering large, contiguous areas across the central county. Mima Mounds have both cultural and functional significance. Prairie vegetation and the mating and nectaring behavior of rare butterflies are often associated with Mima Mounds. The Mima Mounds also have cultural significance, having served historically as an intertribal center of trade. The word “mima” comes from a Chehalis word meaning “newness” and a similar Chehalis word “mianum,” which means, “to be surprised” (DNR 2015).

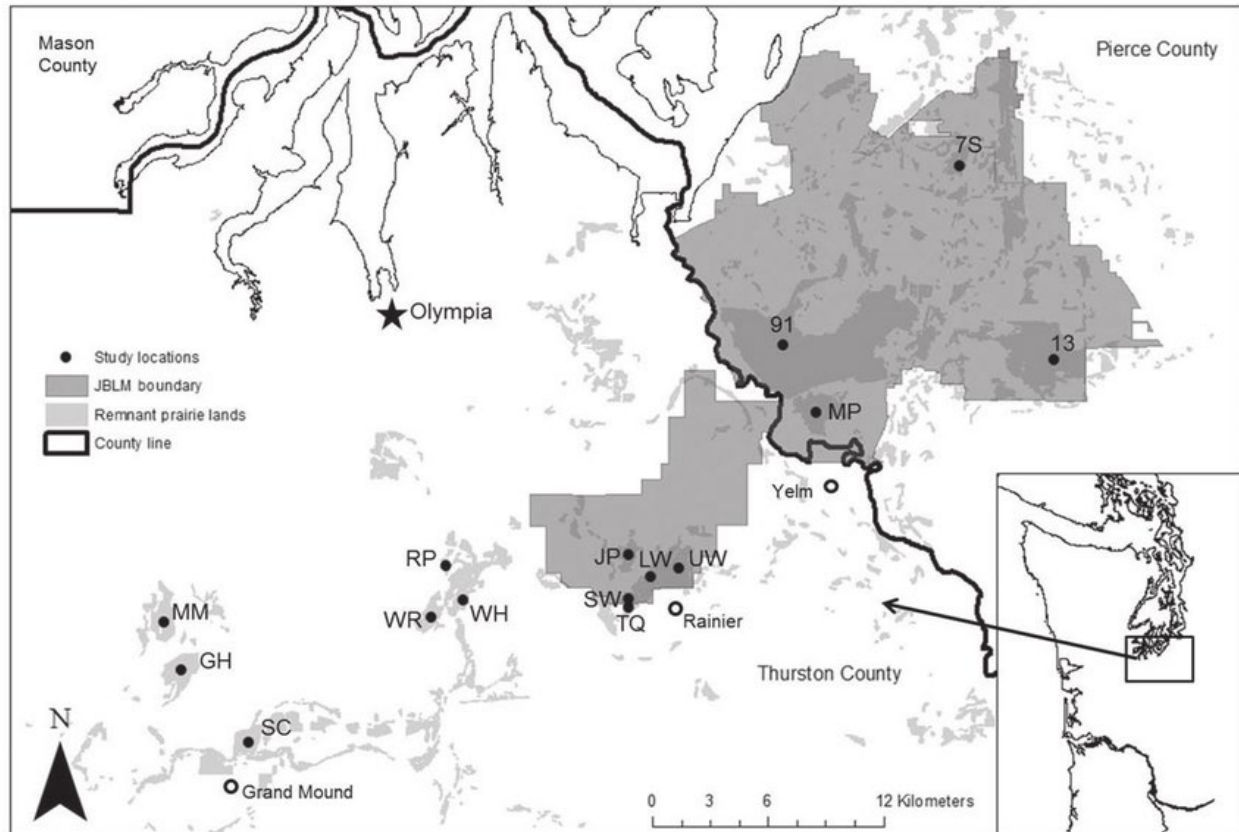


Figure 3.1-1. Locations of Remnant Prairies (Chappell et al. 2008)

Examples of Mima Mound terrain can be found in the Mima Mounds Natural Area Preserve west of Littlerock and in the Scatter Creek and Rocky Prairie areas between Tenino and Grand Mound. The Preserve comprises 637 acres, but Mima Mounds are found in other locations within the state, country, and world. There are many theories as to how these features formed, but the most generally accepted hypothesis is that differential erosion created the mounds, most likely from floods following the last glaciation when water eroded around hexagonal frost-heave patterns in what was permafrost tundra at that time or from differential erosion around tree mounds, where the root systems in huge old-growth forest trees held the soil in place during large flood events (Parker et. al 2008; Washburn 1988).

Glacial drift areas (Figure 3.1-2, Table 3.1-1) are made up of finely ground silt and clay from rocks that were crushed by glaciers. These fines were carried in floods as suspended sediments. After the flooding, they settled in layered lakebed deposits that are impermeable. Because of the way they settled in dense, impermeable layers, groundwater settles above them and cannot penetrate the layers (Crawford and Hall 1997). These wet areas comprise wet prairies as well as wetlands and related surface hydrology systems. Gopher habitat, however, is prevalent in dry prairie areas. Dry prairies were formed from glacial outwash areas. Glacial outwash is much coarser than glacial drift. Glacial outwash typically consists of unconsolidated sand and gravel. Glacial outwash deposits tend to be erodible and fast draining, leaving drier prairie areas that make up suitable gopher habitat.

Prairies can occur on glacial outwash deposits, so the underlying geology and soils of an area sets the maximum extent of a prairie ecosystem. Certain soil types are also key habitat components for the covered species. As such, the analysis focuses on those prairie and wetland soils preferred by covered species where the HCP BMPs and mitigation measures would primarily be implemented under the action alternatives.

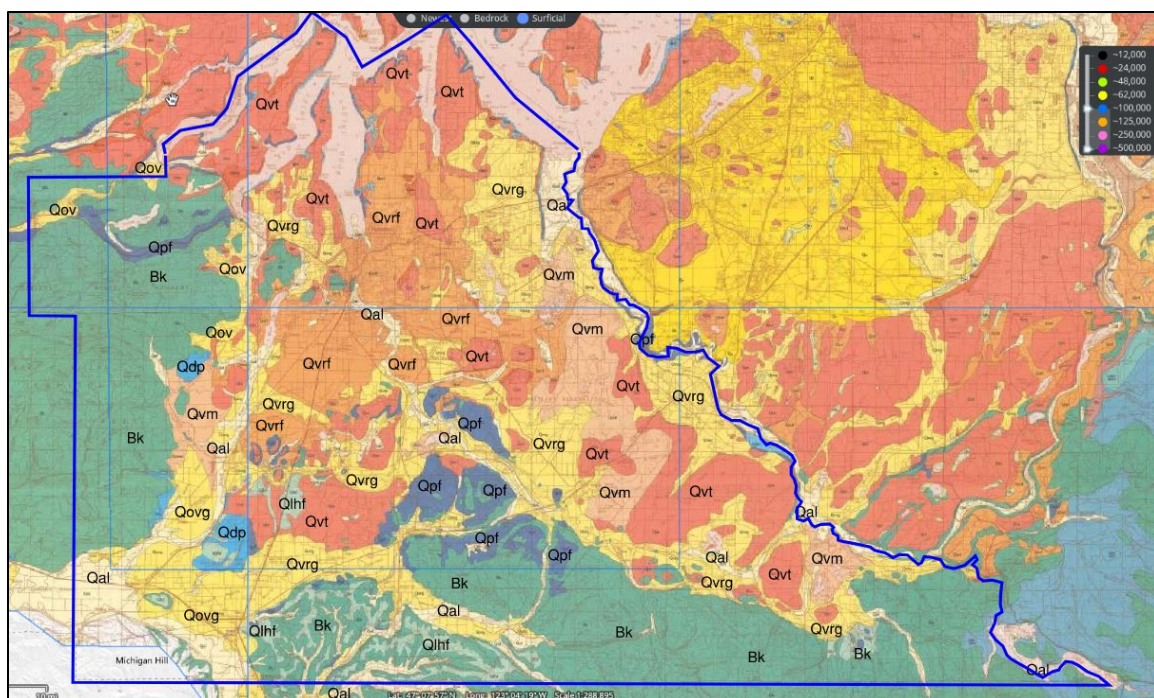


Figure 3.1-2. Primary Geology Map Units in Thurston County (See Table 3.1-1)

Table 3.1-1. Geology Map Units

Geology Map Unit Symbol	Map Unit Description
Qal	Alluvium (Holocene) – Relatively recent flood deposits. Grades from clay to gravel, mostly silt to fine sand in streambed and alluvial fans.
Qdp	Pre-Fraser (Pleistocene) – Undifferentiated glacial and non-glacial deposits.
Qlhf	Logan Hill Formation (Pleistocene) – Alpine glacial outwash sand and gravel mixed with weather tertiary volcanic rocks.
Qvm	Vashon Glaciation Moraine Deposits (Pleistocene) – Glacial deposits from approximately 10,000 to 100,000 years ago, mixture of till (intra-glacial) and outwash (flood deposits).
Qvt	Vashon Glacial Till (Pleistocene) – Intra-glacial materials deposited in place as glacier melted; unsorted glacial sediments ranging from clay to boulder-sized; some densely compacted and some not.
Qvrf/ Qvrg and Qov/ Qovg	Vashon Glacial Recessional Outwash (Pleistocene) – Glacial flood deposits carried by water as glacier melted. Includes ice contact deposits; outwash alluvium and small amounts of ablation till. Qvrg and Qovg are coarser (gravels and larger); Qvrf is finer (sands and smaller). Qov is mixed.
Bk	Bedrock (Tertiary)

3.1.1.2 Soils

Soils in Thurston County are directly influenced by geology, with water-holding or water-drainage capacity being influenced by glacial history and landform. Many of the excessively well-drained soils in

lowland areas support prairies, and most of those can support Mazama pocket gophers. Mazama pocket gophers require excessively well-drained soils with herbaceous cover. Soil rockiness is also thought to influence soil suitability for Mazama pocket gopher, though a quantitative relationship has not been identified. The patterns of glacial deposition are reflected and assessed at finer resolution in the Thurston County Soil Survey maps: NRCS lists over 100 soil types and sub-types in Thurston County (Pringle 1990).

The Soil Survey mapping database is used as a regulatory and biological assessment tool by Thurston County to locate areas that could include prairie ecosystems and/or Mazama pocket gopher habitat. Table 3.1-2 is a list of soil map units used by Thurston County to provide preliminary guidance for field work and subsequent site-specific habitat mapping and field verification.

Table 3.1-2. Thurston County Prairie and Mazama Pocket Gopher Soil Map Units (SMUs)

Soil Map Unit**	Soil Series Name	Soil Map Unit Slope	Soil Characteristics	Gopher Review Required?	Prairie Review Required?
1	Alderwood gravelly	1 = 0 to 3% slopes	Gravelly sandy loam surface;	Yes	No
2	sandy loam	2 = 3 to 15% slopes	shallow to densic glacial till	Yes	No
5	Baldhill very stony	5 = 0 to 3%	Very stony sandy loam surface,	No	Yes
6	loam	6 = 3 to 15%	increasing gravel and stone	No	Yes
7		7 = 15 to 30%	content with depth	No	Yes
8		8 = 30 to 50%	>35% stones	No	Yes
20**	Cagey loamy sand	Relatively flat	Loamy sand surface; winter water table at 2 to 4 ft	Yes	Yes
32	Everett very gravelly	32 = 0 to 8% slopes	Very gravelly sandy loam	Yes	Yes
33	sandy loam	33 = 8 to 15% slopes	surface; increasing gravel content with depth	Yes	Yes
42	Grove very gravelly sandy loam	3 to 15% slopes	Very gravelly sandy loam surface; increasing gravel content with depth	No	Yes
46**	Indianola loamy sand	46 = 0 to 3% slopes	Loamy sand surface; increasing gravel content with depth	Yes	Yes
47		47 = 3 to 15% slopes		Yes	Yes
51	Kapowsin silt loam	3 to 15% slopes	Silt loam surface; shallow to densic glacial till	Yes	No
65	McKenna gravelly silt loam	Relatively flat	Gravelly silt loam surface; shallow to densic glacial till; winter water table at 0 to 1 ft	Yes	No
73**	Nisqually loamy fine	73 = 0 to 3% slopes	Loamy sand surface and	Yes	Yes
74*	sand	74 = 3 to 15% slopes	substrates	Yes	Yes
75	Norma fine sandy loam	Relatively flat	Sandy loam surface; winter water table at 0 to 1 ft	Yes	No
76	Norma silt loam	Relatively flat	Silt loam surface; winter water table at 0 to 1 ft	Yes	No
109	Spana gravelly loam	Relatively flat	Gravelly loam; winter water table at 2 to 4 ft	Yes	Yes
110**, 111**	Spanaway gravelly sandy loam	110 = 0 to 3% slopes 111 = 3 to 15% slopes	Gravelly sandy loam surface; increasing gravel with depth	Yes Yes	Yes Yes
112	Spanaway stony	112 = 0 to 3% slopes	Stony sandy loam surface;	Yes	Yes
113	sandy loam	113 = 3 to 15% slopes	increasing stones with depth	Yes	Yes

Table 3.1-2. Thurston County Prairie and Pocket Gopher Soil Map Units (continued)

Soil Map Unit**	Soil Series Name	Soil Map Unit Slope	Soil Characteristics	Gopher Review Required?	Prairie Review Required?
114**	Spanaway-Nisqually complex	2 to 10% slopes	Gravelly sandy loam and loam sand complex	Yes	Yes
117	Tenino gravelly loam	3 to 15% slopes	Gravelly loam surface; increasing gravel with depth	No	Yes
126	Yelm fine sandy loam	126 = 0 to 3% slopes	Fine sandy loam surface; winter	Yes	No
127		127 = 3 to 15% slopes	water table at 2 to 4 ft	Yes	No

**Preferred Mazama pocket gopher soil mapping units are starred.

In the affected environment, soils suitable for Mazama pocket gopher account for a significant portion of the prairie soils, both of which tend to coincide with relatively flat, accessible, low-elevation areas that can be developed for agricultural, residential, commercial, or other uses with relative ease. Compared to the forested hills and riparian floodplains, well-drained prairie-suitable soils in these areas have been the locus of a disproportionate amount of private and public infrastructure development. Development converts these soils to impervious or compacted surfaces, reducing the already-limited extent of functionally intact prairie soils. This ongoing trend is most intense in areas with higher-density zoning, such as UGAs. These reasonably foreseeable environmental trends and planned actions are expected to continue. Soils mapped in prairie areas and soils preferred as habitat by Mazama pocket gophers are mostly coarse-textured glacial outwash soil types, such as the Indianola loamy sand or the Everett very gravelly sandy loam (Table 3.1-2). Some of these soils have been classified as “more preferred” or “less preferred” as pocket gopher habitat (Figure 3.1-3), based on past habitat mapping patterns (USFWS 2018).

Habitat areas for Mazama pocket gophers in Thurston County are mapped only east of the Black River, which forms a natural barrier to preclude habitat expansion. In addition, known Mazama pocket gopher-occupied sites are mapped as occurring primarily south of the Interstate 5 (I-5) corridor in the north county. Areas north of the I-5 corridor are densely developed and are dominated more by fine-textured glacial sediments rather than the coarser surface sediments that are more common in the southern parts of the County. See Chapter 3.4, Plants and Animals, for a detailed description of habitat for Mazama pocket gophers.

The three Mazama pocket gopher subspecies listed under the ESA in Thurston County—the Olympia, Yelm, and Tenino pocket gophers—occupy certain areas of the county (Figure 3.1-3) but are not individually associated with any specific soil map units within the overall list.

Two important, high-quality prairie reserves located west of the Black River—the Mima Mounds Natural Area Preserve and the Black River Mima Prairie Glacial Heritage Preserve—are mapped as a Spanaway-Nisqually complex. But most of the prairie ecosystems and occupied Mazama pocket gopher habitat in Thurston County are located east of the Black River and occur in the soil map units identified as preferred Mazama pocket gopher soils in Table 3.1-2.

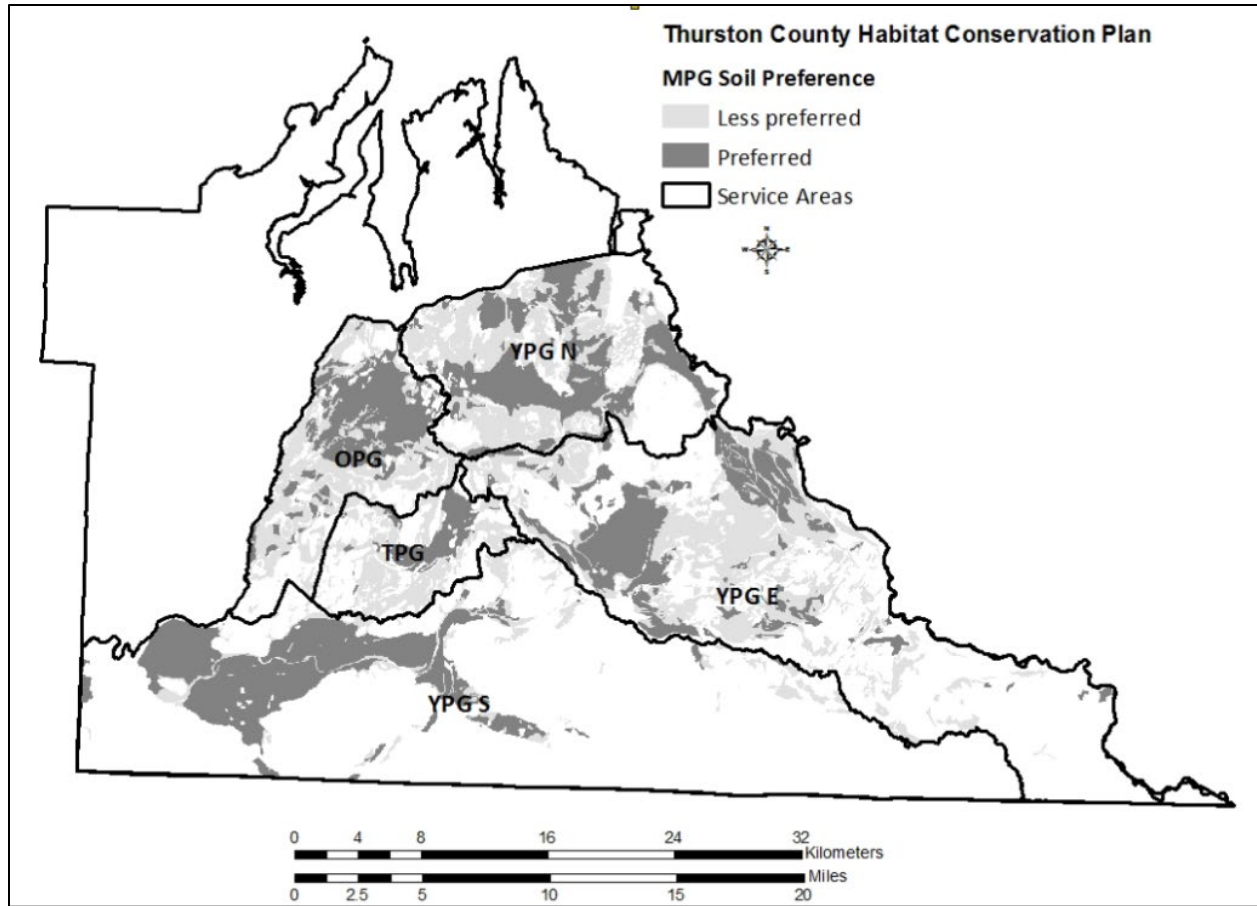


Figure 3.1-3. Mazama Pocket Gopher Habitat Areas and Soil Type Preference (from Thurston County HCP)

Geologic hazard critical areas in Thurston County are defined as areas having the potential for erosion hazards, landslide hazards, and marine bluff hazards. While the Thurston County HCP would apply to all areas of Thurston County within the County's jurisdiction, the prairie and wetland covered species habitats and the area of impact for proposed covered activities would not occur in landslide or marine bluff hazard areas. This analysis, therefore, addresses only the potential for impacts in erosion hazard areas listed in the Thurston County critical areas ordinance (CAO).

Identification of critical areas that include erosion hazards is based on the percent slope and water erosion hazard of soils inventoried as part of the Thurston County Soil Survey (Pringle 1990). The soils that are considered to have a high or severe potential for water erosion include 19 of the County's more than 100 mapped soil types; the critical area soils are listed in TCC 24.15, Table 15-3. The soil units listed as having an erosion hazard potential are generally characterized by a minimum slope of 30 percent and range up to 90 percent. Of the Mazama pocket gopher soil map units listed in Table 3.1-2, only one soil map unit (Baldhill very stony loam, 30 to 50 percent slopes), is rated as "severe" for water erosion hazard rating. This soil unit is within the prairie soil units but is not a preferred gopher soil.

The County projects that 4.9 percent of lands in agricultural use will be converted to other uses between 2020 and 2045 (TRPC 2020a). While agricultural uses will be maintained on many lands, current and foreseeable development trends indicate that the acreage of lands dedicated to agricultural uses will continue to decrease and fragment within an increasingly developed landscape. Existing trends include County, state, and federal grants and technical assistance to agricultural operators on small and large

farms. Ongoing agriculture, consistent with reasonably foreseeable environmental trends, can impact the physical and biochemical functions of native soil and deplete prairie topsoil.

Wetland areas inclusive of Oregon spotted frog habitat are discussed in Section 3.4.2.2. Soil units associated with these wetland areas do include slopes of 30 percent or higher and would not, in themselves, be subject to erosion hazard under the CAO. Erosion hazards that do not meet the definition of high or severe water erosion can erode when disturbed and can be subject to erosion and sedimentation from offsite or upgradient sources in wetlands and along waterways.

3.1.2 Environmental Consequences

Residential development and the other activities described in Section 2.1.1.1 would continue under all of the alternatives, and the alternatives do not differ in their requirements in soil management and precautions to prevent soil impacts.

The County and USFWS have determined that an alternative could have significant adverse impacts on soils if implementation would result in noncompliance with existing state or local regulations for soil protection. The existing regulatory framework has been developed to prevent significant adverse impacts, such as extensive loss of topsoil or disruption of the physical and biochemical functions of soils. Therefore, under any of the alternatives, County-conducted, -permitted, or -authorized projects that comply with these regulations would be expected to avoid significant impacts.

This EIS assesses the potential consequences of an HCP that is designed to project 30 years of landscape-scale impacts. It is not possible to predict the exact location and extent of site-specific impacts from future development; therefore, this EIS necessarily considers the effects of at a broader scale. However, the alternatives include sufficient criteria for site-specific implementation to analyze potential effects on the human and natural environment for NEPA and SEPA purposes. Under any of the alternatives, BMPs designed to minimize the extent of impacts on soils would be applied at project sites in accordance with applicable requirements, including the Thurston County CAO and the NPDES Construction Stormwater General Permit. BMPs that are commonly required include those intended to maintain hydrology, to define requirements for vegetation protection and revegetation, to minimize sediment movement and soil disturbance, and to optimize project timing.

The discussion of impacts for each alternative is directed toward soil impacts as they relate to the significance criterion identified above; underlying geology would not change with any alternative and is not addressed separately from the discussion of soils that arise from underlying geology. Over the permit duration, implementation of the action alternatives and the No Action Alternative would be similar because buildout of residential-zoned properties would be approximately 70 percent of capacity (within current zoning allowances) over the 30-year analysis period. The same development activity is anticipated to occur, but the locations of development would differ based on which alternative is selected.

Under the action alternatives, activities conducted, permitted, or approved by the County would be designed to achieve the biological goal and conservation objectives of the HCP. Conservation measures specified in the HCP would not be included in the No Action Alternative, except in cases where the HCP's BMPs overlap with other existing local requirements (see Section 1.1 for a description of existing procedures). The action alternatives also include the mitigation programs described in Sections 2.1.2.5 and 2.1.3.5. Soils associated with Oregon spotted frog are also associated with wetlands. Because existing local regulations limit and mitigate impacts to wetlands, only minor impacts to these soils are anticipated under any alternative. Please see Section 3.4 for a more detailed analysis of wetland impacts.

Under all alternatives, permitted development will proceed toward 70 percent of residential buildout, as described in Section 2.1.1.4. Soil maps are currently used for preliminary identification of potential prairie habitat areas and potential wetland areas, triggering environmental reviews for CAO resources and occupancy by ESA-listed species. Therefore, certain soil types are important factors both in development of the HCP and in identifying potentially viable habitat for those species. At the countywide scale, the alternatives vary primarily in regard to the mitigation program. At the individual parcel scale, the action alternatives would provide streamlining and certainty for County-permitted development projects and County infrastructure activities on soils suitable for ESA-listed species, as compared to the No Action Alternative. This analysis considers the reasonably foreseeable environmental trends and planned actions (i.e., the affected environment) in combination with each alternative to assess the environmental effects of the alternatives on geology and soils.

3.1.2.1 No Action Alternative

Under the No Action Alternative, the HCP would not be implemented. While countywide development patterns are anticipated to continue similar to those projected under both the Proposed Action and the Modified HCP Alternative, the location of individual projects may vary, as the No Action Alternative is characterized by take avoidance. Impacts to geology and soils from surface grading, excavation, and compaction would continue as residential development reaches 70 percent of projected full buildout. Individual projects would be required to comply with soil protection standards in the Thurston County CAO; larger projects would also be required to implement erosion control measures required under the NPDES Construction Stormwater General Permit and Thurston County construction permits. Compliance with these requirements would be expected to avoid the potential for significant adverse impacts on soil resources.

Under the No Action Alternative, existing procedures for reviewing individual projects for potential impacts to ESA-listed species would continue to be implemented. The three subspecies of *Mazama* pocket gopher are the most likely to occur on individual project sites, so soils would continue to be used as a primary filter to determine whether additional site-specific information is needed to assess the risk of take and to plan for avoidance of unauthorized take of ESA-listed species. Projects on soils not suitable for *Mazama* pocket gopher would typically proceed under normal schedules. Projects on soils suitable for *Mazama* pocket gophers would undergo review for species occupancy or site-specific conditions precluding habitat suitability. Under current procedures and with the current status of the species, most sites are not found to be occupied by ESA-listed species, and ground-disturbing activities can be permitted. With existing development pressures focused on low-elevation, prairie-suitable soils, and without a mitigation program to preserve prairie soils, outcomes of the No Action Alternative include incremental ongoing reductions in the extent and condition of non-occupied prairie-suitable soils in the affected environment. Because the anticipated buildout of Thurston County in the foreseeable future is incremental from the current 58 percent residential buildout to 70 percent residential buildout, and much of that zoning would maintain open space through density limits, the likely impacts on prairie-suitable soils would be moderate.

Although significant adverse impacts are not anticipated, the take avoidance approach under No Action Alternative could lead to increased development pressure in areas with soils that have moderate to high erosion hazard ratings. This possibility is based on the following observations:

- Soil units identified as having an elevated erosion hazard potential are generally characterized by slopes exceeding 30 percent
- Soils preferred by *Mazama* pocket gophers are characterized by slopes less than 15 percent.

Based on these observations, the areas with the greatest potential for presence of ESA-listed Mazama pocket gophers have a comparatively low susceptibility to soil erosion. If take avoidance prevents projects from being implemented in such areas, more projects may be proposed in areas with steeper slopes and greater susceptibility to erosion. Soil protection standards in local regulations would afford protection for the most erosion-prone areas, but some marginally susceptible areas may face development pressure that would not occur if more sites with gentle slopes were available.

Development of non-prairie soils in the study area is generally characterized by low-density residential with exceptions in UGAs and where significant public infrastructure exists. These areas are commonly managed for commercial timberlands. Generally located further from highways and cities, most of these areas have a lower degree of development pressure than prairie-suitable soils, but typically include steeper slopes that would be consistent with the slopes that result in erosion hazard for CAO-listed soils. The interest in developing these areas would be higher under the No Action Alternative due to the lack of ITP coverage for ESA-listed species most likely to occur on prairie soils, potentially resulting in a higher development-related direct soil disturbance resulting in the potential for erosion that would require mitigation.

3.1.2.2 Proposed Action

Under the Proposed Action, USFWS would issue the ITP authorizing take of the covered species that could result from the activities conducted, permitted, or approved by the County. Implementation of these activities would result in surface grading, excavation, and compaction in specific areas that cannot be predicted but would occur in the 30-year permit term. The Proposed Action includes streamlined local procedures for project development in covered species habitat. As mitigation for such project development, the HCP includes a robust conservation lands program that would fully offset impacts of the taking on covered species. The conservation program would include three types of mitigation: establishing new reserves on lands purchased from willing sellers, maintaining and enhancing existing habitat reserves, and working with willing landowners to establish conservation easements on working lands. Implementation of the Proposed Action and resulting conservation actions would result in larger contiguous prairie and agricultural lands conserved than under the No Action Alternative and Modified HCP Alternative. Prairie lands are generally formed from glacial outwash, as described in Section 3.1.1.1. If the Proposed Action is selected, up to 2,698 mitigation acres of new reserves would be created, 433 mitigation acres of working-land easements would be created, and 339 acres of existing reserves would be conserved. Compared to the No Action Alternative and Modified HCP Alternative, the larger contiguous areas of conserved land could result in less potential soil erosion associated with direct soil disturbance, as these areas would not be developed.

In contrast to the No Action Alternative, conducting covered activities on prairie-suitable soils would be streamlined throughout the county with minimization and mitigation measures detailed in the HCP. Under the Proposed Action, these activities could occur on prairie soils and on sites occupied by covered species without the need to evaluate species occupancy or habitat suitability because the HCP includes measures to minimize and mitigate the impacts on covered species. These measures also address existing requirements to protect prairies and erodible soils under the CAO. Together, HCP conservation measures and CAO procedures would minimize the extent of covered activities on prairie soils and erodible soils while maintaining a network of permanent conservation lands.

Table 3.2, above, shows the portion of prairie-suitable or wetland soils (collectively Mazama pocket gopher, Taylor's checkerspot, Oregon vesper sparrow, and Oregon spotted frog habitat) that would be impacted by covered activities during the 30-year term of the ITP. Each of the 10 covered activities (residential, commercial and institutional development; maintenance activities; transportation system development) that contribute to these acreages, as shown in Table 4.4 of the HCP, would include soil-

disturbance associated with initiation of the activity. Exact development locations and activities are unknown at this time but projected over 30 years and described in the HCP. Based on soil series, the majority of that affected acreage is Mazama pocket gopher habitat—8,456 acres. The impacts would be likely to permanently affect only about 8.5 percent of viable Mazama pocket gopher habitat and 1.9 percent of viable combined habitat for the Oregon spotted frog, the Taylor checkerspot butterfly, and the Oregon vesper sparrow.

Mapped potential Mazama pocket gopher habitat is calculated based on suitable soil types. The mapped extent of potential pocket gopher habitat (i.e., Mazama pocket gopher soil map units) is reported to cover 99,890 acres within the active permitting areas. Therefore, this loss of 9,221 total acres represents about 8.5 percent of currently mapped potential Mazama pocket gopher habitat in Thurston County.

The mapped extent of potential occupied habitat for the Oregon spotted frog (39,493 acres), the Taylor's checkerspot butterfly (2,624 acres), and the Oregon vesper sparrow (6,064 acres) totals 48,181 acres. Table 4.5 in the HCP estimates that 765 total acres would be impacted by covered activities. This represents a loss of about 1.9 percent of the potentially affected habitat for these three species.

On individual project sites, temporary and permanent construction impacts to soil would contribute to soil erodibility, which is often a direct effect of stormwater runoff

Native soil functions, such as infiltration and treatment of stormwater, can be replaced in some cases with BMPs designed to mimic natural soil infiltration and treatment functions at the site scale. Soil functions that support growth of certain plant communities—such as in prairie habitats—can be restored or enhanced and maintained after minor disturbances, excavation, and compaction impacts through targeted soil nutrient amendments, physical treatment to break up surface soil compaction, and by planting selected native species which would help the soil biochemical system reestablish.

Soil functions related to density and structure act to provide suitable physical habitat for subsurface burrowing animals or insects. In some cases, impacts to these soil physical attributes from grading, excavation and paving associated with building pads, parking lots, and roads can be avoided or minimized, but, in some areas, the loss of physical soil structure can only be mitigated by protecting appropriate native soil types and habitat in other areas. Under the Proposed Action, the County would minimize and mitigate impacts to covered species by reducing project footprints where practical and permanently protecting equivalent or better habitat. These measures would also protect soil resources as a result of the species' respective dependence on ecosystems associated with the impacted soil resources. For that reason, at a countywide scale, impacts to native soils from the Proposed Action are considered to be beneficial compared to the No Action Alternative, and are thus not significant adverse impacts at this scale.

Under the Proposed Action, maintenance work is likely to temporarily disturb soils to an extremely minor degree. Commercial and industrial development are likely to destroy soil properties throughout individual development sites. Within construction footprints, residential development is likely to have similar impacts as commercial construction, though the within-parcel extent of residential construction would be minimized to the maximum extent practicable under the HCP. Soils on residential parcels outside of the development areas would remain intact. Soils on the HCP conservation site would remain undisturbed from covered activities, aside from minor temporary (and often positive) impacts associated with restoring or enhancing prairie or wetland vegetation. These sites would be managed primarily to preserve and expand plant communities preferred as habitat and forage by the ESA-listed species and to provide suitable substrate for Mazama pocket gopher subspecies to build durable burrows. Monitoring on conservation sites would ensure and confirm adequate site management.

At the individual parcel scale, the Proposed Action differs from the No Action Alternative because, under the Proposed Action, County-permitted development projects and County infrastructure activities would

have limited impacts to soils on sites occupied by ESA-listed species. Anticipated impacts to soils from grading, excavation and paving associated with building pads, parking lots and roads are not expected to be significant due to local and state procedures limiting off-site impacts. Minimization and mitigation measures in the CAO would reduce impacts to the relatively minor amount of erodible soils in the area projected for covered activities under the HCP. Minimization measures in the HCP would also reduce the extent of construction-related impacts on development sites where necessary. The HCP minimization measures would marginally improve trends for soil disturbance and physical characteristics over the No Action Alternative on some sites and may enable development to proceed in some areas where development would not occur under the No Action Alternative. Impacts of the Proposed Action on soil resources would not have significant effects and may be slightly beneficial compared to the No Action Alternative, due to the permanent management of native soil properties on conservation lands. While the Proposed Action would set aside conservation areas, working-land easements, and existing reserve enhancement, development would then take place outside those areas and would be subject to local regulations, stormwater management, and County code requirements. On the lands subject to the HCP, BMPs that are part of the HCP would ensure that impacts to soil in areas subject to the HCP are minimal. Soils associated with Oregon spotted frog are also associated with wetlands. Because existing federal, state, and local regulations already condition avoidance, minimization, and mitigation of impacts to wetlands, impacts to wetlands soils are anticipated to be minor under the Proposed Action. Impacts to erodible soils that would be considered erosion hazards under the CAO are also anticipated to be minor under the Proposed Action.

As under the No Action Alternative, individual projects implemented under the Proposed Action would be required to comply with soil protection standards in the Thurston County CAO, and larger projects would also be required to implement erosion control measures required under the NPDES Construction Stormwater General Permit and Thurston County construction permits. Compliance with these requirements, combined with implementation of the additional BMPs in the HCP, would be expected to avoid the potential for significant adverse impacts on soil resources.

3.1.2.3 Modified HCP Alternative

Under the Modified HCP Alternative, mitigation to fully offset the impacts of the taking of covered species from covered activities would be implemented on new reserves only; working-land easements or existing reserve enhancement would not be used to mitigate the impacts of covered activities under this alternative. Under this alternative, impacts to geology would not differ from those of the Proposed Action. Similar to the Proposed Action, no significant changes affecting geology would result.

Under the Modified HCP Alternative, the HCP-covered activities would be implemented as described for the Proposed Action. Because the difference between the action alternatives is in the conservation-land acquisition criteria, impacts to soils would not differ from those of the Proposed Action. Similar to the Proposed Action, the changes affecting soils would be minimized to the maximum extent practicable. Because all conservation sites under the Modified HCP Alternative would be managed for the highest achievable habitat targets, slightly less mitigation land is expected to be used to offset the same amount of impacts as the Proposed Action. While the total area of soils protected under this Alternative would be slightly less than the Proposed Action, it would be equivalent in maintaining examples of impacted soil resources as would the Proposed Action.

Issuance of an ITP to cover the Modified HCP Alternative would, therefore, result in a minor degree of impacts to soil resources in the affected environment. The degree of impacts would be commensurate with the impacts resulting from the Proposed Action. As with the Proposed Action, limited impacts to soils would occur from both development and County infrastructure activities on sites occupied by ESA-listed species. Minimization and mitigation measures in the CAO would reduce impacts to the

relatively minor amount of erodible soils in the area projected for covered activities under the HCP. Minimization measures in the HCP would also reduce the extent of construction-related impacts on development sites where necessary to minimize the effects of the taking on covered species. The HCP minimization measures would marginally improve trends for soil disturbance and physical characteristics over the No Action Alternative on some sites. This would result primarily from a reduction in developed area on large residential parcels while allowing development to proceed in some areas where development would not occur under the No Action Alternative. BMPs that are part of the HCP, and any additional BMPs required in association with project permitting, would ensure that impacts to soils would be minimal. Existing federal, state, and local regulations require avoidance, minimization, and mitigation for wetlands, which would extend to wetland soils; impacts to wetland soils would be minor under the Modified HCP Alternative. Impacts to erodible soils that would be considered erosion hazards under the CAO would also be minor under the Modified HCP Alternative.

As under the No Action Alternative, individual projects implemented under the Modified HCP Alternative would be required to comply with soil protection standards in the Thurston County CAO, and larger projects would also be required to implement erosion control measures required under the NPDES Construction Stormwater General Permit and Thurston County construction permits. Compliance with these requirements, combined with implementation of the additional BMPs in the HCP, would be expected to avoid the potential for significant adverse impacts on soil resources.

3.1.2.4 Avoidance, Minimization, and Mitigation Measures

As a condition of ITP issuance, ESA Section 10(a)(2)(B)(ii) requires ITP applicants to minimize and mitigate the impact of the taking on covered species to the maximum extent practicable. Mitigation that fully offsets the impacts of the taking on covered activities would meet the Section 10(a)(2)(B)(ii) ITP issuance criterion. ESA authorities do not enable USFWS to require mitigation beyond that which fully offsets the impacts of the taking. The mitigation for impacts to covered species proposed under each action alternative is designed to fully offset impacts of the taking on covered species and would also provide conservation benefits to geology and soil resources, as discussed above.

In accordance with 40 CFR § 1502.16 and WAC 197-11-440(6)(c)(iii), this analysis considers other appropriate mitigation measures to address impacts to other geology and soil resources. These local, state, and federal authorities, which are summarized here and in Section 3.1.1.2, set relevant regulatory mechanisms for protecting various resources with implications on geology and soils, and are common to all alternatives. Nothing in this EIS is intended to limit the mitigation authorities of other agencies, should additional mitigation responsibilities be identified while planning, permitting, or carrying out individual activities.

Under all alternatives, prairies with diverse native plants, and wetland areas with hydric soils receive some protection under CAO regulations, including TCC Chapters 17 and 24 (Thurston County 2020a). The County does allow for limited impacts to these resources, provided appropriate mitigation is implemented, as conditioned by the CAO. Similarly, certain 4(d) exemptions from take prohibitions for the Mazama pocket gopher allow for agriculture activities under any alternative. These measures promote farming with limits on the frequency or intensity of deep tilling. Together, the 4(d) and CAO measures provide some avoidance, minimization, and mitigation approaches for soils.

Other measures common to all alternatives would also avoid, minimize, and mitigate impacts to soils. These include construction requirements for erosion prevention and control devices, as well as local and state requirements for stormwater management. In each of these contexts, Thurston County requires bare soil surfaces be protected from erosion by controlling runoff or seeding with an erosion control

mix. Construction-related BMPs that minimize sediment movement, foreign material discharge, and stormwater runoff, are common to all alternatives.

Existing CAO requirements related to geology and soil resources for prairies and wetlands would be modified under the action alternatives, as necessary, to ensure the protection and management of conservation lands is sufficient to fulfill related CAO requirements, avoiding redundant mitigation.

Under the action alternatives, additional avoidance and minimization measures for geology and soil resources would be realized through HCP minimization measures, referred to as Standard BMPs and Enhanced BMPs within the HCP. Standard BMPs would minimize the extent or intensity of activities covered under the HCP, primarily through project siting. Enhanced BMPs would be voluntary actions to promote native ecosystem management.

Mitigation for impacts to covered species under the action alternatives would also afford protections for associated soil resources. The HCP conservation lands would be protected from development in large blocks to prevent fragmentation of critical soil habitat connections, and they would be managed for native ecosystem attributes where practical, supporting natural soil processes.

3.2 Air Quality and Climate

The study area for air quality and climate is the entirety of Thurston County, including within incorporated cities. Although the alternatives concern activities that would take place only on lands where the County has jurisdiction, activities on those lands generate emissions that affect air quality and greenhouse gas emissions countywide. Under all alternatives, activities that may impact air quality and climate change include short-term construction and long-term changes to commercial, industrial, and residential development and vehicular traffic. The extent and duration of these activities are described in Section 3.2.2, Environmental Consequences.

Air quality is regulated at the federal, state, and regional levels. As part of the Clean Air Act, the U.S. Environmental Protection Agency (EPA) establishes National Ambient Air Quality Standards that specify maximum allowable levels for six common air pollutants, known as “criteria air pollutants.” These pollutants include carbon monoxide, ground-level ozone, lead, nitrogen oxide, particulate matter, and sulfur dioxide. For particulate matter, separate standards are established for coarse particulate matter (particles less than 10 microns in diameter [PM10]) and fine particulate matter (particles less than 2.5 microns in diameter [PM2.5]). Washington State has adopted the U.S. EPA’s threshold levels for criteria air pollutants, which are detailed in WAC Chapter 173-476.

Examples of potential criteria air pollutant sources in Thurston County are listed below (EPA 2021).

- Carbon monoxide – motor vehicle exhaust, machinery that burns fossil fuels
- Ground-level ozone – industrial facilities, electric utilities, motor vehicle exhaust
- Lead – ore and metal processing plants, piston-engine aircraft, waste incinerators
- Nitrogen dioxide – motor vehicle exhaust, machinery that burns fossil fuels
- Particulate matter (fine and coarse) – construction sites, unpaved roads, fields, fires
- Sulfur dioxide – heavy machinery that burns fossil fuels with high sulfur content

At the local level, the County’s Comprehensive Plan includes several policies directed at achieving the goal of protecting and improving the county’s air quality (Thurston County 2020e), establishing a reasonably foreseeable environmental trend. The TCC specifies performance standards for areas zoned for industrial uses, requiring compliance with standards established by the Olympic Region Clean Air Agency.

The Olympic Region Clean Air Agency is a local government agency charged with regulatory and enforcement authority for air quality issues in Clallam, Grays Harbor, Jefferson, Mason, Pacific, and Thurston counties. The agency is responsible for enforcing federal, state, and local air pollution standards and governing emissions of air pollutants from new and existing sources. The Olympic Region Clean Air Agency operates a monitoring station in Lacey. That station measures ozone and particulate matter in real time and reports to the Washington Air Monitoring Network managed by Ecology.

Information in this section is based on the TCCP (Thurston County 2020e), the Thurston Climate Adaptation Plan (TRPC 2018), the Thurston Climate Mitigation Plan (TRPC 2020e), the Sustainable Thurston plan (TRPC 2013b), and the Thurston County Regional Transportation Plan (TRPC 2020f).

3.2.1 Affected Environment

This subsection describes reasonably foreseeable environmental trends pertinent to air quality in the study area. Aside from individual County-permitted development activities and periodic updates to the TCCP, consistent with reasonably foreseeable environmental trends, no other planned actions specific to this environmental discipline have been identified.

3.2.1.1 Air Quality

Air quality in Thurston County is generally good due to the county's climate, physiography, and the limited number industrial facilities that generate air pollution (Thurston County 2020e). In the 1980s and 1990s, the urbanized area of the county was designated as a non-attainment area for coarse particulate matter, based on elevated levels of that pollutant. The primary source of particulate matter that violated air quality standards was wood smoke from woodstoves and fireplaces.

Following the successful implementation of control measures, particulate matter levels were well within allowable levels by the early 1990s, and the designation was upgraded in December 2000. The County operated within a Limited Maintenance Plan for coarse particulate matter from 2000 through 2020. The plan's strategies focused on controlling residential woodsmoke and open burning, including restrictions on outdoor burning, rules that govern the sale and removal of uncertified stoves, certification of new wood-burning devices, and reduction of the use of woodstoves and other devices when air quality is poor. The Limited Maintenance Plan resulted in compliance through 2020, fulfilling the requirement for maintenance plans specified by the Clean Air Act. Although the 20-year maintenance period has ended, the strategies remain in effect.

3.2.1.2 Climate

The University of Washington Climate Impacts Group has done extensive research and modeling of climate change in the Pacific Northwest, including the Puget Sound region. Climate change is anticipated to affect many aspects of the environment, including temperatures, precipitation regimes, streamflow, sea levels, farms and forests, freshwater ecosystems, and marine ecosystems (Mauger et al. 2015). Potential impacts to the HCP's covered species and their habitat as a result of climate change are detailed in Section 3.4, Plants and Animals.

To address the causes of climate change, the County has been working with local partners to develop recommended strategies and actions to help reduce carbon emissions and remain resilient to climate impacts (Thurston County 2020e). In early 2018, TRPC adopted the Thurston Climate Adaptation Plan that recommends more than 90 adaptation actions to help the County and broader South Puget Sound region prepare for and adjust to climate change.

Appended to the Thurston Climate Adaptation Plan (TRCP 2018) is the *Science Summary*, which provides an overview of projected and observed climate change impacts at the global, national, and regional scales. The following list outlines the climate change trends in the Puget Sound region, which, though broader in scale, is likely to be experienced in the study area:

- Warming – from 1980 to 2014, all but 6 years were above the century average (Mauger et al. 2015). Additional changes have included a longer frost-free season and warmer nighttime temperatures (TRPC 2018).
- Precipitation – there is no distinct long-term trend in regional precipitation. However, it is projected that the future is likely to involve warmer and drier summers and warmer and wetter winters with heavy rain events of greater intensity (Mauger et al. 2015).
- Streamflow – modeling for Nisqually River and 11 other major watersheds shows shifts in temperature, volume, and timing (Mauger et al. 2015).
- Sea-Level Rise – the Puget Sound region is expected to experience continued, and possibly accelerated, sea-level rise. However, most of Thurston County shorelines are stable (Pacific Northwest Geodetic Array 2016).
- Farms and Forests – hotter temperatures, precipitation changes, and increased carbon dioxide are expected to lead to significant changes in vegetation growth and distribution (Mauger et al. 2015).
- Freshwater Ecosystems – plants and animals will either adapt and move to new habitats or potentially be eliminated from the ecosystem (WDFW 2011).
- Marine Ecosystems – six climate-driven effects will alter marine and coastal ecosystems: rise in sea surface temperatures, sea-level rise, hydrology, erosion, depleted oxygen, and ocean acidification (Morgan and Siemann 2010).

According to the Thurston Climate Adaptation Plan (TRPC 2018), the following were the predominant sources of greenhouse gas emissions in Thurston County as of 2016:

- Built environment (58 percent) – the energy used in heating, cooling, and lighting residential and commercial buildings.
- Transportation (38 percent) – the energy used to power passenger vehicles, freight, and other commercial cars and trucks.

Following the Thurston Climate Adaptation Plan, the County adopted the following emissions-reduction targets in 2018 (Resolution #15644):

- Achieve 45 percent reduction from 2015 levels by 2030.
- Achieve 85 percent reduction from 2015 levels by 2050.

In 2020, TRPC adopted the Thurston Climate Mitigation Plan, which creates a strategic framework of recommended actions to achieve the emission-reduction goals listed above. The plan was developed by TRPC alongside the County and cities of Lacey, Olympia, and Tumwater, with the goal of reducing greenhouse gas emissions and addressing the effects of climate change in a collaborative and coordinated manner (TRPC 2020e).

3.2.2 Environmental Consequences

The County and USFWS have determined that an alternative could have significant adverse impacts on air quality if implementation would result in noncompliance with federal air quality standards. Similarly, significant impacts on climate are defined as a substantial change (increase or decrease) in long-term trends of greenhouse gas emissions in the study area. This analysis considers the reasonably foreseeable environmental trends and planned actions (collectively described above as the affected environment) together with each alternative in order to assess the environmental effects of the alternatives on air quality and climate.

Residential development and the other activities described in Chapter 2 would continue to occur under all of the alternatives, and the alternatives do not differ in their requirements relative to air quality. As such, all alternatives could have the following impacts on air quality:

- Temporary increases in local concentrations of dust and emissions from construction equipment powered by gasoline and diesel engines during construction
- Continued emissions of air pollutants from commercial, industrial, and residential sources consistent with urban growth trends
- Continued greenhouse gas emissions from vehicular traffic associated with urban growth

As discussed in Chapter 2, the total acreage of development activities would be similar under all alternatives. Over the next 30 years, development of residential-zoned properties is expected to increase from its current level (58 percent of capacity) to approximately 70 percent of capacity, within current zoning allowances. Likewise, implementation of the other activities described in Chapter 2 would be similar under the No Action Alternative and the action alternatives during the same period. Under any of the alternatives, all activities would be required to comply with federal, state, and regional air quality regulations.

Possible differences in the location of residential development projects under the alternatives would not result in differences in the impacts of the alternatives on air quality. For example, the primary driver of air quality impacts from woodstoves and fireplaces (which were largely responsible for the violations of air quality standards in the 1980s and 1990s [TRPC 2020b]) is the total number of those emission sources, not their specific locations.

Emissions from future development activities, such as woodstoves or industrial facilities, would be subject to regulatory thresholds according to local, state, and national air quality standards. It is unlikely that emissions could seriously degrade air quality in the county because the existing monitoring system would identify the issue and the existing regulatory framework would establish corrective actions. As a result, none of the alternatives would result in significant adverse impacts on air quality.

Concerning climate, current trends in greenhouse gas emissions would be expected to continue under all alternatives. The built environment and vehicle emissions would continue to be the primary contributors to greenhouse gas emissions in the study area. Both of these sources are increased by population growth and commercial and residential development, which would occur to similar degrees under all alternatives. As a result, the alternatives would not substantially differ in their contributions to greenhouse gas emissions.

It is possible that a small proportion of residential development would occur in different locations under the different alternatives. However, it is not possible to determine whether variations in the location of residential development would lead to higher or lower levels of vehicle emissions. Any changes in vehicle miles traveled would depend not only on siting decisions made by individual project proponents, but also on the transportation decisions of individual residents and workers. Any attempts to predict those

decisions would be overly speculative. Therefore, it is not possible to state whether any of the alternatives would result in a substantial change in trends of greenhouse gas emissions in the study area.

The differences between the alternatives arise primarily from the way in which mitigation for impacts on the proposed covered species would be implemented and managed. Under the action alternatives, mitigation would be coordinated and implemented in consolidated areas. Under the No Action Alternative, the County would not manage a network of conservation lands because individual projects would be designed to avoid impacts to ESA-listed species. None of the mitigation proposed under the action alternatives are expected to have significant adverse impacts on air quality, nor is the HCP mitigation expected to increase or decrease greenhouse gas emissions in the study area. We lack sufficient information to determine whether mitigation required by the action alternative would contribute to reductions in greenhouse gas emissions in the study area.

3.2.2.1 No Action Alternative

Under the No Action Alternative, County-permitted development projects and County infrastructure activities could result in temporary increases in airborne dust and emissions from construction equipment at and near construction sites. These increases would be short-lived and confined to small areas near project sites, and they would not contribute to noticeable degradation of air quality in the study area. Reasonably foreseeable air quality trends (e.g., temporary localized generation of particulate dust and equipment emissions, and incremental increases in emissions related to industrial and residential land uses as additional facilities are constructed) would be maintained. These impacts are regulated under local, state, and federal regulations unrelated to the proposed federal action.

Compliance with local, state, and federal regulations would be expected to prevent short-term and localized increases in airborne dust and equipment emissions at construction sites from noticeably degrading air quality in the study area. As such, air quality in the study area would be expected to continue to meet federal air quality standards, and no significant impacts on air quality would occur. As discussed above, we lack sufficient information to determine whether the No Action Alternative would result in a substantial change in trends of greenhouse gas emissions in the study area.

3.2.2.2 Proposed Action

Similar to the No Action Alternative, implementation of the covered activities under the Proposed Action could result in short-term and localized increases in airborne dust and emissions from construction equipment near construction sites. Additionally, mitigation site establishment and management under the Proposed Action would result in minor short-term and localized increases in airborne dust and equipment emissions. Management activities may include prescribed burning.

Because construction and certain maintenance activities would not occur on sites occupied by ESA-listed species under the No Action Alternative, and because the County would not establish or manage conservation sites under the No Action Alternative, the geographic extent of temporary increases in airborne dust and equipment emissions would be greater under the Proposed Action than under the No Action Alternative. However, compared to typical construction and maintenance projects, establishment and management of mitigation sites generally entail far less ground-disturbing work and use of construction equipment. As a result, short-term and localized increases in airborne dust and equipment emissions associated with construction and mitigation projects under the Proposed Action would not be discernibly different from those anticipated under the No Action Alternative. Also, as under the No Action Alternative, compliance with local, state, and federal regulations would be expected to prevent short-term and localized increases in airborne dust and equipment emissions at construction and mitigation sites from noticeably degrading air quality in the study area. As such, air quality in the study area would

be expected continue to meet federal air quality standards, and no significant adverse impacts to air quality would occur.

In addition, and in contrast to the No Action Alternative, mitigation activities implemented under the Proposed Action would be consistent with recommended strategies outlined in the Thurston Climate Mitigation Plan, which includes measures such as prairie preservation and a reforestation/afforestation program (TRPC 2020e). However, we lack sufficient information to determine whether implementation of the Proposed Action would contribute to reductions of greenhouse gas emissions in the study area.

3.2.2.3 Modified HCP Alternative

The Modified HCP Alternative would result in similar effects as the Proposed Action. However, the network of conservation lands would consist only of new habitat reserves. Because all conservation sites in the Modified HCP Alternative would be managed for the highest-quality habitat practicable, the conservation network would cover approximately 360 fewer acres than the Proposed Action (Table 3-2), so the extent of air quality impacts would be marginally smaller under this alternative. While there are potential differences in air quality outcomes between the action alternatives at extremely localized scales, any impacts on air quality from mitigation site management are expected to be extremely minor due to the short duration and low intensity of impacts.

As a result, short-term and localized increases in airborne dust and equipment emissions associated with construction and mitigation projects under the Modified HCP Alternative would not be discernibly different from those anticipated under the Proposed Action. Also, as under other alternatives, compliance with local, state, and federal regulations is expected to prevent short-term and localized increases in airborne dust and equipment emissions at construction and mitigation sites from noticeably degrading air quality in the study area. As such, air quality in the study area would be expected continue to meet federal air quality standards, and no significant adverse impacts to air quality would occur. The Modified HCP Alternative would also support certain recommended climate strategies outlined in the Thurston Climate Mitigation Plan (TRPC 2020e). However, we lack sufficient information determine whether implementation of the Proposed Action would contribute to reductions in greenhouse gas emissions in the study area.

3.2.2.4 Avoidance, Minimization, and Mitigation Measures

In accordance with 40 CFR § 1502.16 and WAC 197-11-440(6)(c)(iii), this analysis considers other appropriate mitigation measures not already included in the proposed action or alternatives to address impacts to air quality and climate. Under existing regulations, summarized in Section 3.2.1, mitigation measures related to air quality are achieved through County compliance with National Ambient Air Quality Standards integrated into local development planning and locally managed mitigation measures (e.g., see Section 3.2.1.1 for a discussion of locally managed mitigation of woodstove impacts on air quality). These measures are common to all alternatives. As described above, the action alternatives include measures intended to avoid, minimize, and mitigate impacts to covered species, which would create some minor air quality impacts. These measures are not expected to result in significant adverse effects on air quality and climate.

No additional avoidance or mitigation measures are included in the action alternatives. Nothing in this EIS is intended to limit the mitigation authorities of other agencies, should additional mitigation responsibilities be identified while planning, permitting, or carrying out individual activities.

3.3 Water Resources – Movement, Quality, Quantity, Runoff/Absorption, Groundwater, and Public Water Supplies

Water resources comprise the aquatic environment of Thurston County, including water and habitat quality, seasonal streamflow patterns (i.e., hydrology), groundwater, and public water supplies. Public water supplies are an established and stable utility in Thurston County that is unlikely to substantively change under the alternatives, except to the extent that new water delivery and sewer infrastructure is constructed with new development in habitats occupied by covered species. In contrast, development often results in the delivery of pollutants to surface and groundwater and affects how water moves across the landscape. As such, the type and extent of new development and where it is located can influence water resource conditions within watersheds. The study area for water resources is described in Section 3.3.1.

Thurston County projects that buildout of residential-zoned properties in the permit area will be approximately 70 percent (within current zoning allowances) over the next 30 years. Development will result in the loss of forest and grassland habitats, the conversion of some working agricultural and forest lands to other types of land uses, and an increase in impervious area, each of which can result in immediate or delayed effects on water quality and hydrology. The water resources effects analysis considers whether the action alternatives considered in this EIS are likely to measurably alter the water quality trends and conditions in the County over the life of the HCP relative to the No Action Alternative. Because action alternatives are unlikely to alter the trajectory of development towards 70 percent of full residential buildout and off-site effects of County activities on water quality are otherwise regulated, the effects of development and maintenance activities on watershed hydrology and water quality conditions would be similar for both action alternatives to those that would occur under the No Action Alternative. Because levels of residential buildout countywide are expected to be similar among alternatives, the primary difference between the alternatives that may impact water quality is the establishment of a conservation network under either action alternative. At the individual landowner scale, the alternatives would result in nearly identical measures for avoidance and minimization of impacts to water resources but would vary in terms of planning certainty within the range of Oregon spotted frog. Water resources in Thurston County are governed under a range of federal, state, and local regulatory mechanisms. Relevant federal regulations include the following:

- Clean Water Act (CWA) Section 404 (33 USC Chapter 23, as amended)
- The Safe Drinking Water Act (40 CFR 141)
- The Endangered Species Act (ESA) (16 USC Chapter 35, as amended)

Relevant state regulations include:

- Growth Management Act (GMA) (RCW 36.70A)
- CWA Section 401 certification (federal authority delegated to Ecology)
- NPDES permitting (federal authority delegated to Ecology)
- Hydraulic Project Approval (HPA) (RCW 77.55)
- Water quality standards for ground and surface waters (WAC 173-200 and 201A)

Relevant local regulations include:

- CAO protections governing water resources and aquatic habitats (TCC Chapters 24.10, 24.20, 24.25, and 24.30) and limiting development in flood hazard zones (TCC Chapter 14.38)
- Thurston County public works stormwater management standards (TCC 15.05), sewer system requirements (TCC 15.09), and public water system requirements (TCC 15.10)
- Thurston County ordinances governing the storage and management of hazardous materials (TCC Chapters 17.15, 17.20, 24.10, 24.35)

These regulations would not be modified by the alternatives. They provide a tiered framework for evaluation, public engagement, and permitting to protect water quality in the study area.

3.3.1 Affected Environment

This subsection describes existing conditions and reasonably foreseeable environmental trends pertinent to water resources in the study area. Aside from individual County-permitted development activities and periodic updates to the TCCP, consistent with reasonably foreseeable environmental trends, no other planned actions specific to this environmental discipline have been identified.

The study area for water resources considered in this EIS is all surface and groundwater within the entirety of Thurston County. While the permit area excludes incorporated cities, state and federal lands, and long-term forestry management lands, these excluded areas either drain to and/or lie within watersheds containing unincorporated lands subject to the HCP. Because water resource impacts flow downhill by definition, the effects of future development in incorporated and unincorporated lands must be considered together for the purpose of this EIS. While these downstream effects could also extend beyond county boundaries, state and local regulations protecting surface and groundwater generally limit measurable downstream water quality effects to within a few hundred feet of the source. As such, Thurston County, inclusive of its bordering rivers, streams, and shorelines, is the appropriate study area for evaluation of potential effects on water resources.

The aquatic environment in Thurston County is composed of a network of rivers and streams, numerous lakes and wetlands, and the estuarine nearshore of south Puget Sound. These habitats support a diversity of fish species, including Pacific salmon, steelhead, and resident and anadromous trout, whitefish, sculpins, dace, and Olympic mudminnow, a unique endemic species. The freshwater habitats of Thurston County also support several amphibian and aquatic reptile species, with streams and wetlands in the Black River drainage providing a critical stronghold for the Oregon spotted frog.

Aquatic habitats can be broadly divided into two major regional drainages that dissect the county diagonally from the northwest to the southeast. The northeastern portion of the county comprises watersheds or portions thereof in state Water Resource Inventory Areas (WRIAs) 11, 13, and 14 that drain to south Puget Sound and includes the Deschutes and Nisqually Rivers and several smaller independent tributary streams. The southwestern portion of the County comprises watersheds that drain to the Pacific Ocean via the lower Chehalis River (WRIA 23) and includes the Black River and portions of the Skookumchuck River watersheds. In total, the County has defined 13 major planning watersheds, one of which, the Capitol Forest, is entirely on state-owned forest lands.

To support strategic development and water resources planning, Thurston County has subdivided these 13 major watersheds into 70 sub-watershed scale planning basins ranging from 373 to 31,498 acres (TRPC 2015, 2020c). Excluding the Capitol Forest watershed, 63 planning basins have privately owned lands that are or could be developed in the future and are therefore addressed in this analysis. The

developable Thurston County watersheds and associated planning basins are summarized in Table 3.3-1. As shown, 22 of these planning basins drain to the Chehalis River, and 41 drain to Puget Sound. Several planning basins have one or more stream reaches and/or lakes with identified water quality impairments as shown on Table 3.3-1 below (Ecology 2016).

Thurston County planning basins are grouped into three broad landscape categories: mountainous, lowland, and coastal. The only mountainous basins are found in the eastern Nisqually River and Deschutes River watersheds, while the only coastal planning basins border Puget Sound. All remaining planning basins, including all Chehalis River basins are in the lowland landscape category (TRPC 2013a, 2015).

Table 3.3-1. Thurston County Watersheds and Planning Basins with Potentially Developable Private Lands Subject to Regulation Under the HCP

WRIA	Watershed	Acres	Planning Basins	303(d) Listings ^{1,2}	Drains To
11	Nisqually River/ Nisqually Reach	90,769	Alder Lake	--	Puget Sound
			Bald Hill Lake	--	
			Clear Lake	Total phosphorous	
			Elbow Lake	--	
			McAllister Creek	pH, temperature	
			Nisqually	Temperature, bacteria	
			Nisqually Reach	--	
			Thompson Creek	--	
13	Henderson Inlet	29,432	Yelm Creek	Bacteria, DO, temperature	Puget Sound
			Dana Passage	--	
			Henderson Inlet (East)	Bacteria	
			Henderson Inlet (West)	DO	
	Budd Inlet/ Deschutes River	103,573	Woodard Creek	--	Puget Sound
			Black Lake	Temperature, DO, bacteria	
			Capitol Lake	Total phosphorous, bacteria	
			Chambers Creek	--	
			Deschutes River (lower)	Temperature, DO, bacteria	
			Deschutes River (middle)	Temperature, DO	
			East Bay	Bacteria	
			Ellis Creek	Bacteria	
			Indian Creek	Bacteria	
			Lake Lawrence	Total phosphorous	
			Mission Creek	Bacteria	
			Moxlie Creek	Bacteria, DO	
			Offut Lake	--	
			Percival Creek	Temperature	
			Reichel Lake	Temperature, DO, bacteria	
			Schneider Creek (Budd Inlet)	DO, bacteria	
			Spurgeon Creek	Bacteria	
			West Bay	--	
14	Eld Inlet	23,809	Eld Inlet (East)	Bacteria	Puget Sound
			Eld Inlet (West)	--	

Table 3.3-1. Thurston County Watersheds and Planning Basins with Potentially Developable Private Lands Subject to Regulation under the HCP (continued)

WRIA	Watershed	Acres	Planning Basins	303(d) Listings ^{1,2}	Drains To
23	Totten Inlet	20,387	Green Cove Creek	--	Puget Sound
			McLane Creek	Bacteria, DO, temperature	
			Perry Creek	DO	
			Squaxin Passage	--	
			Burns/Pierre	pH	
			Kennedy Creek	DO	
			Schneider Creek (Totten)	DO	
			Totten Inlet (East)	--	
	Skookumchuck River	55,957	Bloody Run	--	Chehalis River
			Frost Prairie	--	
			Hanaford Creek	--	
			Johnson Creek	--	
			O'Conner	--	
			Salmon Creek	--	
			Skookumchuck	--	
			Thompson Creek	--	
	Black River	80,037	Zenker	--	Chehalis River
			Black River	pH	
			Allen Creek	--	
			Beaver Creek	--	
			Bloom Ditch	pH	
			Dempsey Creek	--	
			Mima Creek	--	
			Salmon Creek	pH	
	Chehalis River	47,127	Waddell Creek	--	Grays Harbor/Pacific Ocean
			Chehalis River	--	
			Lincoln Creek	--	
			Michigan Creek	--	
			Prairie Creek	pH	
			Scatter Creek	--	

¹ Ecology 2016 (Section 303(d) listed waterbodies).

² DO = dissolved oxygen.

TRPC (2020c) completed land-cover analyses by planning basin as part of an ongoing effort to assess and monitor basin health as population grows and communities expand to accommodate growth. This analysis characterized the acreage of open water, unconsolidated shorelines (e.g., the exposed shorelines of Puget Sound and large rivers), and palustrine and estuarine wetlands, which are summarized by watershed in Figure 3.3-1. As shown, surface waterbodies and associated shorelines account for 0.05 percent to 4.5 percent of total watershed acreage, with most of this area associated with large lakes and rivers, reservoirs, and the nearshore waters of Puget Sound.

Reasonably foreseeable trends in water resource conditions are informed by this regional planning information. These trends are influenced by the effects of development at watershed scales, which will continue to occur under the No Action Alternative and the action alternatives. We are not aware of additional planned actions that are likely to have additional effects on water resources beyond those likely to result under the proposed action.

Water quality and stream habitat conditions are directly and indirectly related to land use and land cover. The condition of an array of physical, chemical, and biological water quality conditions can be inferred from metrics like impervious surface area and intact forest and prairie cover. TRPC (2013a, 2015) summarized research by May et al. (1997), Booth (2000); and Booth et al. (2002), which documents clear relationships between forest cover, impervious area, and the following water quality, quantity, and habitat metrics:

- Hydrology (2-year flood elevation and discharge rates)
- Riparian buffer width
- Channel stability and erosion
- Woody debris density
- Conductivity
- Biological condition, as measured by benthic index of biotic integrity

Functional wetlands also play a critical role in regulating watershed hydrology and water quality (Granger et al. 2005; Sheldon et al. 2005). Wetland function is in turn a function of basin impervious area, the ability to maintain intact vegetated buffers, and protection of groundwater recharge and hydrologic connectivity between wetlands. The County CAO emphasizes the protection of vegetative buffers and groundwater recharge areas to maintain wetland function at the watershed level.

Other research (Ecology 2008; Mohamedali et al. 2011) has established relationships between land use classification, impervious area, and loading and concentration of a wide range of water quality pollutants, including toxic organic contaminants, metals, and nutrients. Collectively, this research demonstrates the relationship between land use, impervious surface area, forest cover, and watershed hydrology and the physical, chemical, and biological aspects of and water quality. Impervious surface area and percent forest canopy and intact grassland and prairie habitat are therefore useful metrics for evaluating potential land use effects on water quantity and water quality.

TRPC (2015, 2020c) has modeled trends in impervious surface area, forest cover, grassland and shrub/scrub habitat and wetlands since 1992. Historical trends and projected changes in impervious surface, vegetated land cover, and functional wetland area provides a useful basis for evaluating changes in water resource conditions over time. Trends in impervious area, forest cover, grassland and shrub/scrub cover, and wetland cover are summarized by planning watershed in Figures 3.3-2 through 3.3-4, respectively. Trends in forest and grassland cover are influenced by timber harvest on privately owned commercial forest lands, increased development in prairie and forest habitat, agriculture, and

other land uses. Some changes in forest cover (e.g., in the Deschutes Mountain Zone watershed) are clearly due to harvest activities.

This information is supported by available water quality monitoring data. Thurston County (2018) tracks water quality conditions at 33 sites distributed across 31 waterbodies in 7 of 13 planning watersheds. Routine monitoring parameters include fecal coliform bacteria, dissolved oxygen, pH, total phosphorous, nitrate and nitrites, and turbidity. The County has developed a rating system that ranks water quality conditions on a “poor” to “excellent” scale using a water quality index score that considers the number of observed exceedances of state water quality criteria. The most recently available metrics for impervious surface area, forest and grassland shrub/scrub habitat, and wetland area in each watershed are summarized in Table 3.3-2 below.

Thurston County has projected future impervious surface and intact forest canopy by planning watershed under full buildout conditions to facilitate comprehensive development planning (TRPC 2015). However, less than full buildout is anticipated under any of the alternatives. Under all alternatives, including the No Action Alternative, the County projects that buildout of residential-zoned parcels in the County’s jurisdiction will not exceed 70 percent (within current zoning allowances) over the 30-year analysis period for this EIS. The forest canopy projection is based on forest lands that the County has identified as vulnerable to development, meaning lands that are currently forested but are zoned for residential, commercial and/or industrial uses. Undeveloped lands zoned for developed uses are referred to here as vulnerable. Lands zoned for long-term resource use, such as designated forestland, are assumed to be less vulnerable to development than forests or grasslands zoned for residential or commercial land uses. Undeveloped grasslands are a focal point for development but face greater development restrictions than forestlands to protect ESA-listed species. The quantity of vulnerable forestlands and undeveloped grasslands in each study area watershed at present and projected under 70 percent of full residential buildout provides a useful basis for evaluating the potential effects of the action alternatives relative to the No Action Alternative.

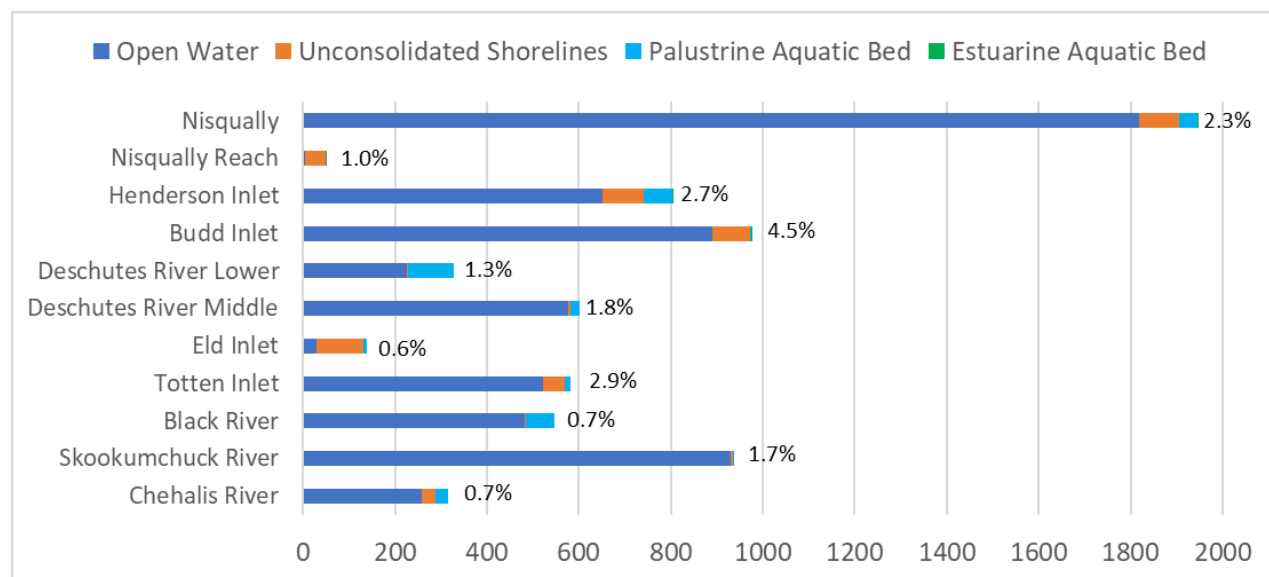


Figure 3.3-1. Surface Water Acres by Waterbody Classification in Thurston County Watersheds Subject to Future Development and Surface Water Acreage as Percent of Total Watershed Area

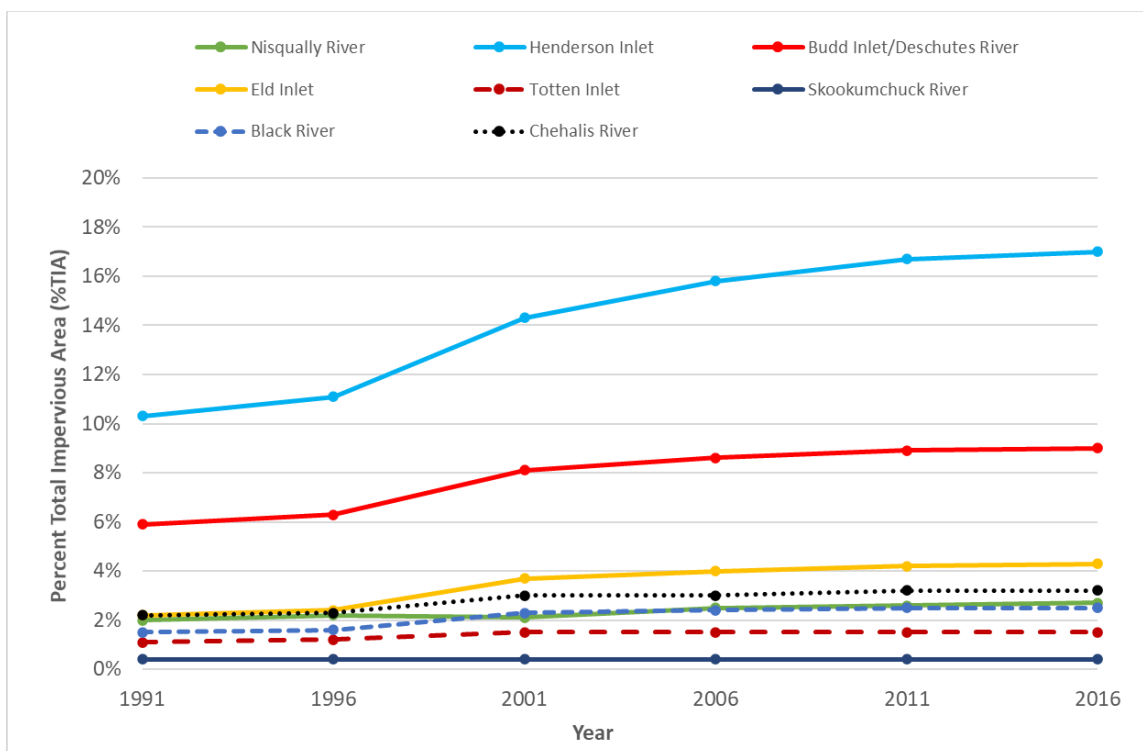


Figure 3.3-2. Change in Percent Total Impervious Area (%TIA) in Selected Thurston County Planning Watershed, 1992–2016 (TRPC 2020c)

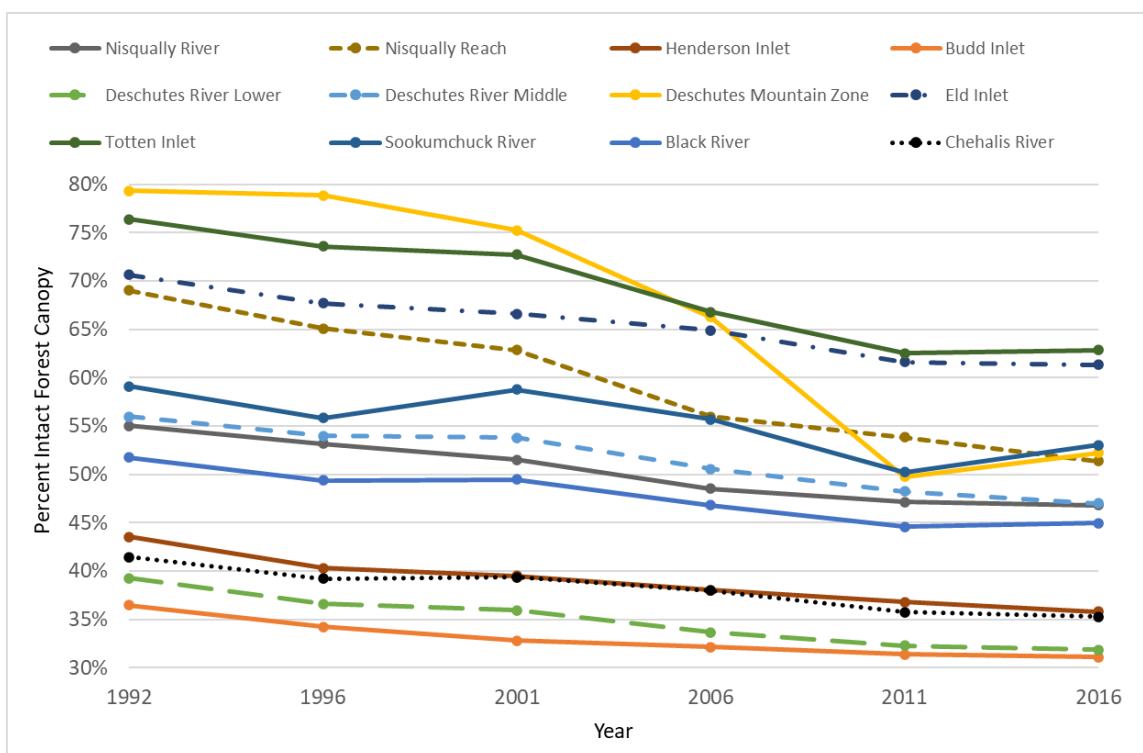


Figure 3.3-3. Change in Percent Intact Forest Canopy by Thurston County Planning Watershed, 1992–2016 (TRPC 2020c)

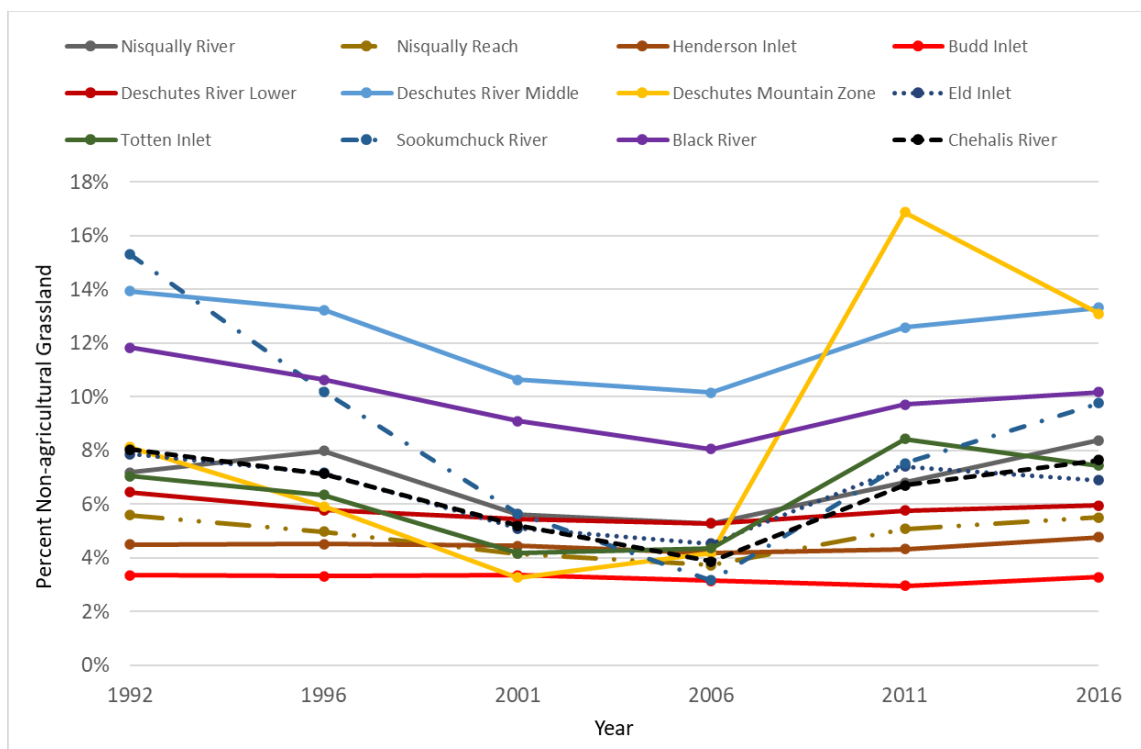


Figure 3.3-4. Change in Percent Grassland and Shrub/Scrub Cover by Thurston County Planning Watershed, 1992–2016 (TRPC 2020c)

Table 3.3-2. Summary of Most Recently Available Impervious Area, Forest and Grassland or Prairie Cover, and Water Quality Index Ratings for Thurston County Planning Watersheds.

Watershed	Percent Impervious ¹	Percent Forest Cover ²	Percent Non-Agricultural Grassland ²	Number of Monitoring Basins ³	Basin Count by Water Quality Index Rating ³				
					Poor	Poor to Fair	Fair	Fair to Good	Good
Nisqually River	3.9%	46.8%	8.4%	4	1	--	1	--	2
Nisqually Reach	11.9%	51.3%	5.5%	0	n/a	n/a	n/a	n/a	n/a
Henderson Inlet	16.1%	49.0%	4.8%	3	--	2	1	--	--
Budd Inlet	13.9%	31.1%	3.3%	11	2	--	4	3	2
Deschutes Lower	13.5%	52.2%	13.1%	0	n/a	n/a	n/a	n/a	n/a
Deschutes Middle	2.2%	31.8%	5.9%	0	n/a	n/a	n/a	n/a	n/a
Deschutes Mountain	0.9%	47.0%	13.3%	0	n/a	n/a	n/a	n/a	n/a
Eld Inlet	4.3%	61.3%	6.9%	3	--	--	1	--	2
Totten Inlet	1.9%	62.9%	7.4%	2	--	--	1	--	1
Skookumchuck River	0.8%	53.0%	9.8%	0	n/a	n/a	n/a	n/a	n/a
Black River	2.6%	44.9%	10.2%	4	--	--	3	1	--
Chehalis River	3.5%	35.3%	7.6%	4	--	--	2	2	--

1 Estimated impervious surface as percent of watershed area in 2010 (TRPC 2015).

2 Estimated undeveloped forest or non-agricultural grassland (potential prairie habitat) as percent of watershed area in 2016 (TRPC 2020c). These percentages include working forestlands that have been harvested but are not vulnerable to development.

3 Number of water quality monitoring basins and basin count by most recent Thurston County Water Quality Index rating based on data collected between 2011 and 2016 (TRPC 202g).

3.3.2 Environmental Consequences

The environmental consequences of the alternatives on water resources are evaluated using three effect mechanisms, which are based on the impervious surface, forest cover, and prairie/grassland metrics described in the previous section. As discussed, these metrics are commonly used to guide strategic development planning (TRPC 2015, 2020c) because they are demonstrably linked to physical, biological, and chemical water quality effects (Booth 2000; Booth et al. 2002; May et al. 1997; TRPC 2015). These effect mechanisms and related measurement metrics are described in Table 3.3-3 below, and the relationship of these effect mechanisms to covered activities and proposed BMPs are detailed in Appendix C. This analysis considers the reasonably foreseeable environmental trends and planned actions (collectively described above as the affected environment) together with each alternative in order to assess the environmental effects of the alternatives on water resources.

Table 3.3-3. Effect Mechanisms and Measurement Metrics for the Water Resources Analysis

Effect Mechanism	Measurement Metric
Increased runoff and pollutant loading from new impervious surfaces	Projected change in planning basin % total impervious surface area from 2010 through full buildout
Reduced shade, flood storage, pollutant filtration, and increased input of toxics and nutrients from loss of forest cover	Projected change in planning basin % forest canopy from 2010 through full buildout
Reduced flood storage, pollutant filtration, and increased input of toxics and nutrients from loss of forest from loss of wetlands	Change in planning basin % grassland and shrub/scrub habitat from 2010 through full buildout

Thurston County (2013) and TRPC (2013a) previously linked threshold ranges for impervious surface area and changes in land cover class to different categories of risk for aquatic habitat degradation. The relative risk of adverse impacts on water quality and quantity can be inferred at the planning watershed scale for each alternative by examining trends in linked threshold ranges for impervious surface area and land cover class.

Measurement metrics and significance thresholds for assessing potential impacts to water resources are as follows:

Metric – Projected change in watershed percent total impervious surface area from 2010 through full buildout (percent total impervious area [%TIA])

- Data source: TRPC (2015, 2020c) and supporting data provided by Thurston County
- Effect thresholds (Thurston County 2013): <10%TIA = basin properly functioning (PF); ≥10% and <25%TIA = basin is at risk (AR); ≥25%TIA = basin is not properly functioning (NPF)
- Significance criterion: Change in basin functional status for %TIA (e.g., from AR to NPF status)

Metrics – Projected change in combined watershed intact forest canopy (%Forest) and potential prairie habitat (%Grassland and shrub/scrub) from 2010 through full residential buildout

- Data source: TRPC (2015, 2020c) and supporting data provided by Thurston County
- Effect thresholds (Thurston County 2013): >65% of basin area with hydrologically intact forest and/or prairie = PF; 50% to 65% of basin area in intact forest and/or prairie = AR; <50% of basin area in hydrologically mature forest and/or prairie = NPF
- Significance criterion: Change in basin functional status for %Forest and/or %Prairie

These metrics provide a basis for evaluating the projected effects of development under the No Action Alternative on water resources. Under any of the alternatives, development to 70 percent of full residential buildout would result in increase in %TIA and a decrease in %Forest/Grassland cover at the watershed level and could therefore generate incremental adverse effects on water resources at a sub-watershed level. Buildout assumptions described in 2.1.1.4 are used in this analysis for comparison of changes in these metrics across watersheds. Changes in metric values large enough to shift a watershed into a different functional status category would represent a degree of effect on water resources that may be locally significant and minor at broader scales.

The action alternatives would establish permanent conservation sites where development would not occur, and habitat would be permanently managed. The removal of these areas from the acreage of land available for development would prevent conversion of those lands to impervious surface and protect some existing wetland and prairie habitat. Measurable effects on water resources at watershed and study area scales would only occur if the action alternatives lead to different levels of development than would otherwise occur under the No Action Alternative. Specifically, measurably different effects on water resources would only occur if the action alternatives would limit development in a given watershed to less than 70 percent of full residential buildout over the 30-year life of the HCP. This provides a basis for evaluating the effects of the action alternatives on water resources relative to the projected effects of the No Action Alternative. A watershed that is likely to shift to a different functional status level in one or more water quality impairment metric under the No Action Alternative may be less likely to do so if significant amount of acreage is protected in RPAs.

Development in floodplains is typically accompanied by flood protection infrastructure and is more likely to lead to adverse effects on water resources than upland development. Development in floodplains is regulated under existing CAO and SMP requirements and flood hazard area development restrictions in TCC Chapter 14.38. These development restrictions would continue to apply equally under any alternative, meaning that there would be effectively no difference in development-related floodplain impacts between alternatives. The action alternatives include changes to road maintenance activities in floodplains related to OSF habitat, but these activities would not measurably alter the analysis metrics used to evaluate water resources in this EIS.

3.3.2.1 No Action Alternative

Under the No Action Alternative, development in Thurston County would continue at expected rates, reaching an estimated 70 percent of full residential buildout conditions over the next 30 years. Individual projects would meet antidegradation regulations under the EPA by adhering to SMP and CAO regulations set forth by Thurston County and local jurisdictions. Additionally, individual projects would be required to meet National Pollutant Discharge Elimination System (NPDES) requirements regulated by the Department of Ecology, regardless of which alternative or No Action Alternative is chosen. Thurston County would continue to build and maintain public water resource infrastructure commensurate with development needs. These regulatory mechanisms and infrastructure development needs would apply equally to the action alternatives, meaning that the water resource analysis metrics described above provide a useful basis for establishing baseline conditions under the No Action Alternative.

Thurston County (TRPC 2015) has projected changes in %TIA and %Forest cover under full buildout conditions, providing a basis for estimating trends over the foreseeable 30-year period. This analysis assumes that vulnerable forest and prairie habitats in Thurston County would be subject to development toward 70 percent of zoning capacity (in residential-zoned areas) within 30 years, and that buildout would increase the impervious cover. Projected increases in impervious cover are displayed as %TIA in Table 3.3-4. Vulnerable forests and grasslands are undeveloped lands that are zoned for development

(i.e., not designated for forestry, agriculture, or open space). This assumption allows for estimation of land cover percentages and functional condition ratings at the 30-year point using the effect thresholds described in Section 3.3.2.

Projected metric values and functional status ratings for %TIA under the No Action Alternative are presented in Table 3.3-4. As shown, %TIA would increase by 1.1 to 3.7 percent across all planning watersheds under the 30-year projection at 70 percent of full residential buildout (Table 3.3-4). The Henderson Inlet (+3.7 percent), Budd Inlet (+3.4 percent), and the Nisqually Reach (+2.6 percent) watersheds would see the largest increases in %TIA. None of the planning watersheds are expected to shift into a new %TIA functional status rating during this period, although the Budd Inlet watershed would approach the NPF threshold. While watershed-level shifts are unlikely to occur, several planning basins in watersheds draining to Puget Sound are likely to move to a poorer functional status rating. For example, under current development projections, one planning basin in Henderson Inlet is expected to shift from the AR to the NPF rating by 2035, while two planning basins in Budd Inlet would shift from AR to the NPF, and two more would shift from PF to AR (TRPC 2013a).

Table 3.3-4. Thurston County Planning Watershed %TIA Values and Functional Status Ratings in 2010, Projected %TIA Ratings in 30 Years and Under Full Buildout Conditions

Watershed	%TIA			Functional Status Rating ¹		
	2010	30-year Projection	Full Buildout Projection	2010	30-Year Projection	Full Buildout Projection
Nisqually River	3.9%	6.3%	7.3%	PF	PF	PF
Nisqually Reach	11.9%	14.5%	15.6%	AR	AR	AR
Henderson Inlet	16.1%	19.7%	21.3%	AR	AR	AR
Budd Inlet	20.5%	24.0%	25.4%	AR	AR	NPF
Deschutes River Lower	13.5%	16.1%	17.3%	AR	AR	AR
Deschutes River Middle	2.2%	3.9%	4.6%	PF	PF	PF
Deschutes River Upper	0.9%	2.3%	2.9%	PF	PF	PF
Eld Inlet	4.3%	5.6%	6.2%	PF	PF	PF
Totten Inlet	1.9%	3.0%	3.4%	PF	PF	PF
Skookumchuck River	0.8%	2.1%	2.7%	PF	PF	PF
Black River	2.6%	4.2%	4.8%	PF	PF	PF
Chehalis River	3.5%	5.6%	6.5%	PF	PF	PF

1 Ratings in **bold** represent a shift in functional status rating from the prior period.

Projected metric values and functional status rating for %Forest/Grassland cover under the No Action Alternative are presented in Table 3.3-5. As shown, the projected loss of vulnerable forest and grassland cover over the next 30 years varies, ranging from 0.2 percent in the mountainous terrain of the Deschutes River Upper to 19.0 percent in the low-lying Chehalis River. The Chehalis, Black River (-11.6 percent), and Deschutes River Middle (-10.5 percent) watersheds would see the largest changes in land cover during this period (Table 3.3-5). The Deschutes River Lower and Black River watersheds would likely shift from AR to NPF and PF to AR landcover categories during this period, respectively. These impacts would not occur in grasslands in areas reserved for long-term agriculture and in designated forestlands, as these areas are already zoned for non-development uses.

Combining the projected changes in landscape metrics and functional status ratings is useful for identifying which watersheds are likely to experience the largest potential changes in water quality and water quantity conditions under the No Action Alternative. For example, while the Henderson Inlet, Budd Inlet, and Deschutes River watersheds are likely to remain in the AR category for %TIA over the next 30 years, each would experience increases in impervious area on the order of 2.7 to 3.7 percent. These watersheds would concurrently lose 2.9 to 5.1 percent of existing forest and grassland cover.

Similarly, while the Black and Chehalis watersheds would see marginally smaller increases in %TIA over the next 30 years, they are projected to see combined losses of vulnerable forest and grassland cover of 11.6 and 19.0 percent, respectively. These watersheds are already at or near functional status thresholds so the projected loss of forest and grassland cover over the next 30 years would likely shift these watersheds to a new functional status category (Table 3.3-5).

Table 3.3-5. Thurston County Planning Watershed %Vulnerable Forest/Grassland Values and Functional Status Ratings in 2010, Projected %TIA Ratings in 30 Years and Under Full Buildout Conditions

Watershed	%Forest/Grassland Cover			Functional Status Rating ¹		
	2006	30-year Projection	Full Buildout Projection	2006	30-year Projection	Full Buildout Projection
Nisqually River	61.0%	55.2%	52.7%	AR	AR	AR
Nisqually Reach	69.7%	67.6%	66.6%	PF	PF	PF
Henderson Inlet	53.1%	50.1%	48.8%	AR	AR	NPF
Budd Inlet	48.8%	45.9%	44.7%	NPF	NPF	NPF
Deschutes River Lower	50.4%	45.4%	43.2%	AR	NPF	NPF
Deschutes River Middle	65.5%	55.0%	50.5%	PF	AR	AR
Deschutes River Upper	75.3%	75.1%	75.1%	PF	PF	PF
Eld Inlet	77.9%	70.5%	67.4%	PF	PF	PF
Totten Inlet	74.8%	70.9%	69.2%	PF	PF	PF
Skookumchuck River	64.4%	59.1%	56.8%	AR	AR	AR
Black River	65.9%	54.3%	49.3%	PF	AR	NPF
Chehalis River	47.6%	28.6%	20.5%	NPF	NPF	NPF

1 Ratings in **bold** represent a shift in functional status rating from the prior period.

The projected changes in these watersheds could translate to measurable effects on surface water quality and hydrology. Decades of research has shown that similar increases in impervious area and loss of intact land cover are associated with negative effects on water quality, stream channel stability, benthic invertebrate community structure, and hydrologic conditions in western Washington rivers (Booth 2000; Booth et al. 2002; May et al. 1997; TRPC 2013a). Changes in land cover are commonly accompanied by shifts to higher intensity land use, which leads to the increased concentrations of metals and other toxic pollutants in stormwater runoff (Feist et al. 2011). This relationship is demonstrated in Table 3.3-6, which summarizes the increase in stormwater pollutant concentrations associated with different levels of development in Puget Sound watersheds (Ecology 2008). This table compares median baseline concentration of several different contaminants in surface water runoff from undeveloped forest and grasslands to the median concentrations in stormwater runoff from progressively intensive types of development, presented as multiples of the baseline value.

Table 3.3-6. Land Use Effects on Stormwater Pollutant Concentrations in Puget Sound Watersheds

Chemical of Concern ¹	Baseline Concentration – Undeveloped Forest and Grassland (µg/L) ²	Increase in Runoff Concentration Relative to Baseline by Land Use Type ¹		
		Agricultural	Residential	Commercial/Industrial
Arsenic	1.0	2X	2X	4X
Cadmium	0.013	38X	38X	115X
Copper	1.0	5X	4X	25X
Lead	0.5	10X	20X	40X
Zinc	2.0	5X	15X	60X

**Table 3.3-6. Land Use Effects on Stormwater Pollutant Concentrations in Puget Sound Watersheds
(continued)**

Chemical of Concern ¹	Baseline Concentration – Undeveloped Forest and Grassland (µg/L) ²	Increase in Runoff Concentration Relative to Baseline by Land Use Type ¹		
		Agricultural	Residential	Commercial/ Industrial
Mercury	0.005	1X	2X	40X
Total PCBs	0.001	10X	20X	30X
Total PBDEs	8.000E-06	4X	5X	3X
Carcinogenic PAHs	0.006	25X	25X	167X
High MW PAHs	0.005	20X	20X	160X
Low MW PAHs	0.015	20X	20X	200X
bis(2-Ethylhexyl)phthalate	0.10	100X	100X	100X
Total Dioxin TEQs	1.000E-07	50X	50X	100X
DDT and Metabolites	0.003	2X	0X	0X
Triclopyr	0.004	15X	8X	8X
Nonylphenol	0.030	10X	10X	133X

1 PCB = polychlorinated biphenyls; PBDE = polybrominated diphenyl ether; PAH = polycyclic aromatic hydrocarbon; TEQ = Toxicity Equivalence; DDT = dichloro-diphenyl-trichloroethane

2 Baseline concentration values and multiples by land use category are based on 50 percent exceedance thresholds for observed concentrations in stormwater runoff for each chemical of concern, as reported by Ecology (2008).

As shown, pollutant concentrations in runoff can increase substantially when intact forest and grasslands are developed. Observed median concentrations of metals in runoff from residential development range from 2 to 38 times the undeveloped baseline, while concentrations of some organic contaminants can increase by as much as 100 times. More intensive forms of development require more impervious surface, increasing pollutant delivery to surface waters (Table 3.3-6).

While the impacts of development on water resource conditions described above are clear, it is important to recognize that the foundational research cited previously by Thurston County and in this analysis (Booth 2000; Booth et al. 2002; Ecology 2008; May et al. 1997; Thurston County 2013; TRPC 2013a, 2015) reflect conditions that pre-date modern stormwater detention and treatment standards to varying degrees. In fact, the effects of various types of development on water quality described above led to degraded water quality, as part of the baseline conditions of the affected environment. However, the research cited above was instrumental in the development of the modern standards behind the State's stormwater guidance (Ecology 2019b) and Thurston County's stormwater management manual Drainage Design and Erosion Control Manual (Thurston County 2016). Both the state guidance and County ordinance requirements are now designed to avoid and minimize adverse effects on water quality and hydrology to the greatest extent practicable. Incorporated jurisdictions have development ordinances with similar requirements.

Given this regulatory framework, all future development in Thurston County, both in incorporated and unincorporated areas would be expected to conform to modern stormwater standards. Compliance with modern standards is expected to minimize, but not fully eliminate, the effects of future development on water resource conditions in Thurston County. In theory, it is possible that if effects of future development on water resource conditions are not fully eliminated, a sub-watershed could move to NPF status; however, this is speculative and not supported by available data. Considering the baseline

conditions in the study area, trends, and existing regulations, this EIS evaluates a worst-case overestimate of the potential impacts of future development under the No Action Alternative.

In summary, if the No Action Alternative is selected, Thurston County is still projected to reach 70 percent of full residential buildout over the next 30 years. This is also true for the Proposed Action and the Modified HCP Alternative. The real differences between the three alternatives are in the selection of conservation lands, where development occurs in response, and the type and distribution of habitats that would be affected as a result. If the No Action Alternative is selected, it is expected that development would continue under current management direction and that County building permits would be issued where take could be avoided. These restrictions could increase development rates in forested lands where ESA-listed prairie-dependent species are not present. Additionally, there would be no new funding or programs for voluntary habitat restoration, no new resources for control of invasive plants, and habitat would only be maintained on existing reserves and where compatible management incidentally occurs.

As shown in Table 3.3-5, future development under the No Action Alternative is projected to change the functional status rating for the %Forest/Grassland metric in three watersheds over the 30-year life of the HCP, Deschutes River Lower, Deschutes River Middle, and Black River. No change in functional status rating is projected for the %TIA metric under the No Action Alternative, but large changes in impervious area would occur in several watersheds (Table 3.3-4).

3.3.2.2 Proposed Action

Under the Proposed Action, the Thurston County HCP would be implemented, streamlining County permit decisions and approval of maintenance projects throughout the affected environment. Similar to the No Action Alternative, lands would be developed incrementally. Under the Proposed Action, however, the County would also manage a coordinated network of conservation lands, including new reserves, working lands, and enhancements to existing reserves. The County has projected that 3,469 acres would be managed under the conservation network. Once established, the conservation sites would be legally protected from development and permanently managed for the species and compatible uses. For this analysis, “projected conservation sites” refers to the estimated 3,469 acres that would be purchased and set aside based on estimated revenue from the HCP mitigation fee program.

Under the Proposed Action, the County would emphasize the inclusion of conservation lands in RPAs. The HCP details calculation methods and metrics used to assess the relative contributions of lands in and out of RPAs. Conservation for some covered species, such as Oregon spotted frog, would drive individual conservation goals outside of RPAs. The RPAs occur in 8 of 12 Thurston County planning watersheds, ranging from 77 to 1,207 total acres covering 0.8 to 9.5 percent of watershed area. For this analysis, the distribution of conservation sites is assumed to be distributed across watersheds similarly to the proposed RPAs, covering 0.1 to 1.6 percent of parent watershed acreage.

Under the Proposed Action, future development in each watershed is expected to proceed toward 70 percent of full residential buildout over the 30-year life of the HCP. Development would be expected to accommodate and expand around newly established conservation sites. The presence of RPAs would not be expected to alter this trajectory. This can be assessed by comparing projected RPA acreage to the projected increase in impervious area and the acres of intact forest and grasslands vulnerable to development under full buildout.

A comparison of projected RPA acreage to the acres of forest and grassland habitat vulnerable to development estimated to remain at 70 percent of full residential buildout is provided by watershed in Table 3.3-7. The removal of projected conservation lands from the pool of lands available for development could, in theory, prevent some of the loss of intact forest and grassland habitat that would

otherwise occur under the No Action Alternative. However, as shown in Table 3.3-7, the projected conservation lands represent a small fraction of total watershed area and only a portion of the estimated remaining acres of vulnerable forest and grasslands at year 30 of HCP implementation. The Proposed Action may shift the distribution of development on forest and grassland habitat relative to the Modified HCP Alternative or No Action Alternative. The Proposed Action includes three different types of conservation actions: establishment of new habitat reserves, creation of working-land easements, and enhancement of existing reserves, which would protect grasslands, prairies, and wetlands, as appropriate for each covered species. The No Action Alternative would maintain Thurston County's current process for permitting development without conservation lands and the Modified HCP Alternative includes only new habitat reserves. Based on those differences, the Proposed Action could distribute development impacts more evenly compared to the Modified HCP Alternative, which could maintain the trends of agricultural lands conversion seen in the No Action Alternative. Even though conservation in RPAs under the Proposed Action may modestly shift the distribution of development in each planning watershed, sufficient land is available to accommodate projected conservation lands acreage and allow development to proceed to 70 percent of full residential buildout.

In summary, this analysis indicates that the Proposed Action is not likely to alter the overall rate or extent of development relative to the No Action Alternative. The Proposed Action is, therefore, unlikely to result in different watershed %TIA and %Forest/Grassland conditions from the No Action Alternative over the next 30 years and would therefore not be significant per the effects thresholds and significance criteria established above. The effects of the Proposed Action on water resource conditions in Thurston County are therefore unlikely to be substantively different from those occurring under the No Action Alternative at the watershed level.

Table 3.3-7. Comparison of Protected Land Acreage Under the Action Alternative to Projected Increases in Impervious Area and Loss of Forest and Grassland Habitat Due to Development

Watershed	Total Acres	Remaining Vulnerable Forest and Grassland Acres at year 30		Action Alternative Reserve Priority Areas	
		Acres	% of Watershed	Acres	% of Watershed
Nisqually River	85,525	4,959	4.8%	434	0.5%
Nisqually Reach	5,247	112	3.6%	0	0.0%
Henderson Inlet	29,447	904	3.9%	193	0.7%
Budd Inlet	21,912	628	3.0%	0	0.0%
Deschutes River Lower	25,743	1,305	4.7%	360	1.4%
Deschutes River Middle	33,396	3,508	8.5%	360	1.1%
Deschutes River Upper	22,436	42	4.2%	0	0.0%
Eld Inlet	23,794	1,747	4.1%	0	0.0%
Totten Inlet	20,418	795	4.1%	0	0.0%
Skookumchuck River	55,863	2,949	2.9%	77	0.1%
Black River	80,045	9,261	6.6%	1270	1.6%
Chehalis River	47,079	8,929	2.3%	713	1.5%

3.3.2.3 Modified HCP Alternative

The Modified HCP Alternative would provide additional protection to HCP species by managing conservation sites for the highest practical habitat targets for covered species, as opposed to the combination of intact land purchases and working-land easements that would occur under the Proposed Action. The number, size, and distribution of conservation lands under this alternative are expected to be otherwise similar to the Proposed Action. The Proposed Action includes three types of conservation actions: new habitat reserves, working-land easements, and existing reserve enhancement. Under the Modified HCP Alternative, habitat reserves are the only mitigation measures that would be implemented. Compared to the Proposed Action, additional development pressure could be put on working lands because the Modified HCP Alternative would not include conservation easements on working lands as part of the conservation program. This could potentially increase impervious surfacing in areas where none would occur under the Proposed Action.

Establishment of new reserves for covered species represents the highest-quality habitat goals. Compared to the conserved working lands and enhancements to existing reserves under the Proposed Action, the Modified HCP would target high-quality native habitat conditions on each conservation site. Acreages associated with new reserves that would be established under the Modified HCP Alternative multiplies the HCP-derived average credit yields for the covered species (1.83 for Olympia pocket gopher, Tenino pocket gopher, and Yelm pocket gopher; 0.8 for Taylor's checkerspot butterfly and Oregon vesper sparrow; 1 for Oregon spotted frog) by calculated functional acres in the HCP to define reserve requirements (HCP Table 7.8).

As discussed in Section 2.1.1.4, Thurston County has projected that that buildout of residential-zoned parcels in the County's jurisdiction will not exceed 70 percent (within current zoning allowances) over the next 30 years. Some of this land will include existing intact forest and grassland areas that have been identified as vulnerable to development. Assuming these areas will develop at the same rate, 70 percent of residential zoning capacity, including vulnerable forest and grassland, could be realized in the next 30 years. As with the Proposed Action, the projected RPA acreage represents a small fraction of total watershed area and only a portion of undeveloped forest and grassland areas that are potentially vulnerable to development under full buildout conditions. This indicates that sufficient land is available in each planning watershed to accommodate the projected conservation lands while allowing residential development to proceed to 70 percent of full buildout. While the different alternatives may result in different land use distribution—including uses other than residential—and therefore may have slightly different water quality impacts, all alternatives are anticipated to result in 70 percent of full residential buildout. Therefore, the effects of the Modified HCP Alternative on water resources in Thurston County are likely to be similar to those described above for the No Action Alternative and the Proposed Action. Those effects may be significant in the three study area watersheds per the analysis criteria defined but would not be meaningfully different from those likely to occur under the No Action Alternative.

3.3.2.4 Avoidance, Minimization, and Mitigation Measures

In accordance with 40 CFR § 1502.16 and WAC 197-11-440(6)(c)(iii), this analysis considers other appropriate mitigation measures not already included in the proposed action or alternatives to address impacts to water resources. Under existing regulations, summarized in Section 3.3.1, avoidance, minimization, and mitigation measures related to water resources are indirectly authorized through

requirements for compliance with the CWA and related regulations through local and state procedures, which are common to all alternatives.

Under any alternative, the requirements of the Thurston County CAO and SMP regulations would provide authority to directly address impacts to water resources and floodplains, including avoidance, minimization, and mitigation to meet local, state, and federal standards. County ordinances governing new development, discharges to surface waters, and maintenance of existing infrastructure identify requirements to avoid, minimize, and mitigate project designs that would alter the timing or quality of stormwater leaving project sites.

Under the action alternatives, the County would recommend additional BMPs to land managers with covered species habitat that would not be developed. These measures would be aimed primarily at avoiding and minimizing impacts associated with the taking of covered species and would also enhance the effectiveness of existing protections for water resources at the county level, beyond the measures required under the No Action Alternative. For example, the HCP's minimization measures include incentives to minimize the footprint of impervious surfaces, which would complement the County's existing measures that more directly address water quality. The action alternatives also provide mitigation for impacts to Oregon spotted frogs that would meet or exceed other regulatory mitigation standards for wetlands, without replacing those regulatory procedures. As a result, the action alternatives provide for marginal enhancement to existing mitigation measures to address impacts to water resource and floodplains.

As described above, the action alternatives are not expected to result in significant adverse effects to water resources compared to the No Action Alternative, so no additional avoidance or mitigation measures are proposed for inclusion in the action alternatives. Nothing in this EIS is intended to limit the mitigation authorities of other agencies, should additional mitigation responsibilities be identified while planning, permitting, or carrying out individual activities.

3.4 Plants and Animals – Habitat, Unique Species, and Habitat Connectivity

The study area for Plants and Animals is the jurisdictional area of Thurston County. This section describes the existing Plant and Animal resources in the study area and considers the potential for impacts to Plant and Animal resources associated with implementation of the Thurston County HCP. Species proposed for coverage under the HCP, along with sensitive plant and wildlife resources known to occur in Thurston County that could be affected by the Proposed Action or other alternatives are addressed. This section is divided into separate discussions of vegetation, noxious weeds and prairie invasive vegetation, wetlands, and wildlife.

3.4.1 Regulatory Requirements

Select laws, regulations, and guidance applicable to vegetation and wildlife associated with the Thurston County HCP are summarized below.

Federal

The ESA protects plants and animals in danger of, or threatened with, extinction. USFWS is responsible for implementing the ESA for those species under its jurisdiction. The ESA and its implementing regulations in Title 50 of the Code of Federal Regulations (CFR), Section 17, prohibit the take of any fish or wildlife species that is federally listed as threatened or endangered without prior approval pursuant to either Section 7 or Section 10 of the ESA. Section 3 of the ESA defines “take” as “to harass, harm,

pursue, hunt, shoot, wound, kill, trap, capture, or collect or to attempt to engage in any such conduct” (16 United States Code [USC] § 1532 (19)). The term “harm” is defined to include any act “which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering” (50 CFR § 17.3).

Section 7(a)(2) of the ESA requires each federal agency to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat (16 USC § 1536 (a)(2)).

Section 9 of the ESA prohibits the “take” of threatened and endangered species, including the attempt or action to “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect” such species (16 USC § 1532).

Section 10 of the ESA allows non-federal applicants, under certain terms and conditions, to incidentally take ESA-listed species that would otherwise be prohibited under Section 9 of the ESA. When a non-federal landowner or other non-federal entity wishes to proceed with an activity that is legal in all other respects, but that may result in the incidental taking of an ESA-listed species, an ITP may be requested. Under Section 10 of the ESA (16 USC § 1539), an HCP that meets USFWS’ statutory and regulatory requirements is required to accompany an application for an ITP to demonstrate, among other requirements identified below, that the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking.

The CWA (33 USC § 1251 et seq.) protects the physical, chemical, and biological integrity of the nation’s waters, including lakes, rivers, wetlands, and coastal waters. Programs conducted under the CWA are directed at both point source pollution (e.g., waste discharged from outfalls and filling of waters) and nonpoint source pollution (e.g., runoff from parking lots). Under the Clean Water Act, EPA and Ecology set effluent limitations and issue permits under CWA Section 402, governing point-source discharges of wastes to waters. The U.S. Army Corps of Engineers, applying its regulations under EPA guidelines and oversight, issues permits under CWA Section 404, governing the circumstances under which dredged or fill material may be discharged to waters. These Section 402 and 404 permits are the primary regulatory tools of the CWA.

Under Section 401 of the CWA, Ecology has the authority to certify federal permits for discharges to waters under state jurisdiction. Ecology may review proposed federal permits (e.g., Section 404 permits) for compliance with state water quality standards. The permit cannot be issued if the state denies certification. Compliance with the conditions on covered activities described in the HCP is consistent with the requirements of the CWA.

The Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 USC 703–713), makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to federal regulations. USFWS is charged with ensuring MBTA compliance.

Washington State

Washington State Endangered and Protected Species Regulations

Fish, wildlife, and shellfish in Washington State are managed by WDFW (Title 77 RCW; WAC 220). A primary responsibility of WDFW is its Priority Habitats and Species (PHS) program, which provides relevant information on important fish, wildlife, and habitat resources in Washington. PHS acts as WDFW’s primary approach to conserving fish and wildlife. Counties use PHS to update CAO regulations

per GMA requirements. WDFW has developed species status reports and preservation guidelines and recommended programs for all species covered under the HCP.

The Washington Natural Area Preserves Act, amended 1981 (RCW 79.70), established the Washington Natural Heritage Program (WNHP) within the DNR. The WNHP identifies species and ecosystems that are priorities for conservation efforts, maintains a database for priority species and ecosystems, and publicly shares the information so that it can be used for environmental assessments and conservation planning.

The Washington State Noxious Weed Control Board and State Noxious Weed List (RCW 17.10, WAC 16-750) work to limit economic loss and adverse effects on Washington's agricultural, natural, and human resources due to the presence and spread of noxious weeds on all terrestrial and aquatic areas in the state. The Noxious Weed Control Board helps coordinate and support the activities of county noxious weed control boards and weed districts of Washington. Thurston County has adopted the state's Noxious Weed List, which are included in Appendix D of this EIS.

Washington's Shoreline Management Act governs appropriate uses within shorelines of the state; see Section 3.3, Water for more information on shorelines. Associated wetlands are those in proximity to and either influence or are influenced by tidal waters or a lake or stream subject to the Shoreline Management Act. Factors used to determine whether wetlands meet the "proximity and influence" test include periodic inundation and hydraulic continuity.

Thurston County

The GMA (RCW 36.70A) of 1990 requires state and local governments to manage Washington's growth by identifying and protecting critical areas and natural resource lands, designating UGAs, and preparing comprehensive plans and implementing them through capital investments and development regulations. Thurston County has adopted GMA regulations for protecting critical areas that include specific mitigation requirements and defer to state and federal requirements to protect habitats for state- and ESA-listed species. TCC Chapter 24.01, the CAO, defines critical areas as all wetlands, frequently flooded areas, aquifer recharge areas, fish and wildlife habitat conservation areas, and geologically hazardous areas. If the Thurston County HCP is implemented, the CAO would be revised to be consistent with the HCP and would defer to the HCP for covered species.

3.4.2 Affected Environment

This subsection describes existing conditions and reasonably foreseeable environmental trends pertinent to plants and animals in the study area. Aside from individual County-permitted development activities; periodic updates to the TCCP; and maintenance of existing habitat reserves, consistent with reasonably foreseeable environmental trends, no other planned actions specific to this environment discipline have been identified.

Characterization of the affected environment in the study area for plants and animals relies on best available information in existing publications describing the condition of existing natural habitats in the study area and the biology and ecology of known or potentially occurring species. These baseline conditions were established from Thurston County current land use, population, watershed, and associated data collected and reported by TRPC; WDFW species data for Thurston County; DNR's natural heritage database; Thurston County Noxious Weed Board data; and background data sources used to develop the proposed Thurston County HCP.

3.4.2.1 Vegetation

The study area is subdivided into three ecoregions that vary in elevation and contribute the County's biological diversity. Moving from east to west, these are the West Cascades, Puget Trough, and Northwest Coast ecoregions (Omernik 1987).

Eastern Thurston County is in the West Cascades ecoregion and is mountainous, with elevations primarily over 1,000 feet and characterized by steep ridges and river valleys. Within Thurston County, the West Cascades ecoregion is dominated by conifer forests of western hemlock and Douglas-fir, with lower valleys of bottomland hardwoods and oak savannas, western redcedar common in river drainages, and riparian forests of bigleaf maple, black cottonwood, and red alder (WDFW 2005).

The Northwest Coast ecoregion is along the western boundary of Thurston County and primarily falls within the Capitol State Forest and in the southwest corner of the county that is part of the Willapa Hills. The Northwest Coast ecoregion is characterized by a more rounded topography. Within Thurston County, vegetation in the Northwest Coast ecoregion is predominantly in conifer forest cover of Douglas-fir, western hemlock, and western redcedar, with some black cottonwood and red alder along rivers and streams (Vander Schaaf et. al. 2006).

The central, most populous, portion of Thurston County is within the Puget Trough ecoregion, also known as the Puget lowlands, which is characterized by a broad, rolling landscape that includes lower Puget Sound bays, peninsulas, islands, and estuaries with elevations primarily below 1,000 feet (Sorenson 2012). The Puget Trough ecoregion, the primary focus of the Thurston County HCP, includes large, low-gradient rivers that originate in the adjacent mountains of the West Cascades ecoregion and small streams that originate in the Puget Trough at lower elevations. Oregon white oak, bigleaf maple, and red alder forests are frequent components in the forest and prairie habitats of the Puget Trough ecosystem within Thurston County. Changes in landscape management supporting urban development—most notably fire suppression—have increased rates of forest encroachment on open grasslands. This trend has accelerated the transition of historical prairie habitats to mixed coniferous and deciduous forest lands.

The ongoing loss of historical prairie habitats in Thurston County has imperiled a number of prairie-dependent species, leading to targeted habitat preservation efforts focused primarily in the western prairies of the Puget Trough ecoregion. The WDFW PHS program manages information on Washington State species that require protective measures for their survival due to their population status, sensitivity to habitat alteration, and/or recreational, commercial, or tribal importance. WDFW's PHS lists 14 priority habitats for Thurston County, of which Oregon white oak woodlands, west side prairie, riparian, and freshwater/fresh deep-water wetlands are the focus of analysis of the Thurston County HCP (WDFW 2021). Priority habitats, which are identified as important habitats in TCC 24.25.065, are vegetation community types with elements that are important for individual species. Oak woodlands and prairie habitats as well as wetlands are discussed in this section and further discussed for individual species included in the proposed ITP.

Oak Woodlands

Ecosystems in the study area ecoregions are assemblages of species occurring within specific physical environments that vary in size from a small waterbodies to large landscapes (Sayre et al. 2009). The oak woodlands ecosystem, listed in TCC as Oregon White Oak Habitat, a habitat of local importance (TCC 24.25-4), dominates the Thurston County lowlands outside of urban areas and is associated with dry, predominantly low-elevation areas that experienced frequent pre-European settlement fires, resulting in fire-adapted species (Sorenson 2012). Ecological succession in the absence of fire tends to favor increased shrub dominance in the understory, increased tree density, and increased importance of

conifers, with the end result being conversion of unmanaged prairies to a conifer forest, barring natural disturbances, such as fire, that are less common in the modern landscape. In the modern landscape, prevention of the trend away from oak woodlands to Douglas-fir/hemlock/western redcedar forest cannot occur without active management. Where controlled burns or direct tree removal are not used in active management, the open prairie and oak savannas of the oak woodlands ecosystem described below will continue to decline. On nearby JBLM, over 16,000 acres of prairie habitat has converted to Douglas-fir forest since the mid-19th century (Shaff and Foster 2003). While an equivalent measure of forest encroachment is not available for the affected environment, the information from JBLM provides a relevant example of this ongoing trend.

The vegetation of the oak woodland ecosystem ranges from grass-dominated prairie to oak savanna with pockets of oak woodlands to oak-dominated forests. Upland prairies, also listed as a habitat of local importance in TCC 24.25-4, have well-drained soil and have been largely converted to farmland (Alverson 2005). Oak savannas have scattered oaks and a ground flora similar to upland prairies but are adapted to a wetter environment and include a high diversity of flora. Oak savannah occurs adjacent to open prairie and was once the most abundant community type in the Puget Trough landscape but is now nearly gone (Chappell and Crawford 2005). Alverson (2005) notes that 350 native vascular plant taxa are generally restricted to prairies, savannas, and associated oak woodlands and, of these species, 42 species are native grasses, 75 species are native asters, and 30 species are native lilies. Of primary importance to the prairie ecosystem is the native species assemblage of the Roemer's fescue-white-top aster community (Table D-1 of Appendix D). Stinson (2005) notes that Roemer's fescue, a native bunchgrass, usually covers 30 to 70 percent of the space in this community type and native forbs, sedges, mosses, and lichens are interspersed with bunchgrass. Additional species present in the drier prairie community are included in TCC 24.25-8 and wetter oak savanna plants are included in TCC 24.25-7.

Noxious Weeds and Prairie Invasive Vegetation

Noxious weeds are non-native plant species designated as noxious by federal, state, or county governments. They are highly destructive, competitive, and/or difficult to control and cause ecological and economic damage. Noxious weeds can reduce crop yields, displace native species, and displace native plant and animal habitats. The Washington State Noxious Weed Control Board and State Noxious Weed List (RCW 17.10; WAC 16-750) work to limit economic loss and adverse effects on Washington's agricultural, natural, and human resources due to the presence and spread of noxious weeds on all terrestrial and aquatic areas in the state. The Noxious Weed Control Board advises the Washington State Department of Agriculture (WSDA) on noxious weed control in Washington State. Thurston County, in turn, has a noxious weed control board supported by TCC 17.30 that enforces noxious weed control pursuant to the state rules and maintains a list of noxious weeds known to occur in Thurston County (Table D-2 of Appendix D).

The prairie ecosystem is particularly susceptible to invasion by noxious weeds and other non-native plant species. The most common grass invaders are primarily pasture and turf species, such as bentgrass, bluegrass, and tall oatgrass. Tall oatgrass, another European native, establishes and reproduces rapidly in dry prairie soils, quickly outcompeting native species (Dennehy et.al. 2011). Several hundred acres of tall oatgrass is currently encroaching on prairie habitat essential to the recovery of Taylor's checkerspot butterfly on nearby JBLM (78 FR 61473). Scotch broom, an upland shrub native to Europe, is a prolific invader of prairie habitats. This species, classified as a class B noxious weed in Washington State, is quite difficult to eradicate. Scotch broom is now widely established and has likely become a permanent part of the landscape in the Pacific Northwest (Dennehy et.al. 2011). The full list of invasive noxious, native, and pasture/turf species, including forbs, that affect the prairie ecosystem are included in Table D-3 of Appendix D. In addition to invasive species, native plants can also be invasive in the prairie ecosystem. For example, Nootka rose and common snowberry are native

upland shrub species that were historically excluded from prairie habitats by fire. In the absence of fire, these species can displace native prairie vegetation through competition and shading, leading to the eventual loss of functional prairie habitat (Chappell et al. 2001).

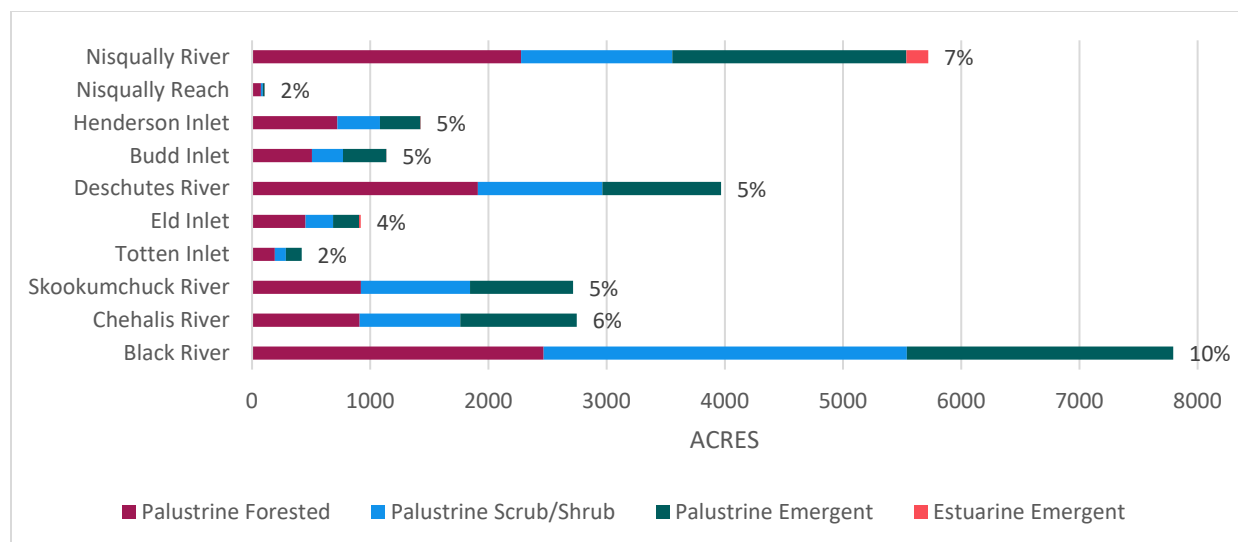
The remaining prairie habitats in Thurston County are vulnerable to ongoing degradation from invasive and non-native species encroachment. As native plant species are replaced by invaders, the prairie-dependent species that rely on them lose suitable habitat and are also displaced. Historically prairie habitats were maintained by fire, used by native peoples to maintain desirable vegetation communities. Today the combined threats posed by invasive species and native vegetation encroachment require regular intervention and management at levels that have not occurred for a variety of reasons. For example, some of the more effective management methods, like controlled burning and herbicide application, can be difficult to implement near developed areas. The fragmentation of remaining prairie habitat into disconnected patches with multiple landowners also contributes to inconsistent management. Should these foreseeable environmental trends continue, the ongoing loss of functional prairie habitat to invasive and native species encroachment is a virtual certainty that could, over the long-term, lead to the local extirpation and/or eventual extinction of prairie dependent species.

3.4.2.2 Wetlands

The study area includes a diversity of wetland and riparian vegetation communities that are generally characterized by their plant species and habitat components (Oakley et.al. 1985). The glaciated topography of the study area provides a complex network of wetlands and other water resources that are important habitat for resident aquatic and riparian species. These areas also provide travel corridors for wide-ranging and migrating species.

Study Area Wetlands

TRPC (2020c) included a watershed-level analysis of wetland types, including palustrine forested, palustrine scrub/shrub, palustrine emergent, and estuarine emergent; these wetland types are included in Figure 3.4-1, along with percentages of wetland type per watershed. Most wetlands that are not the stream-associated palustrine aquatic beds or estuarine aquatic beds described in Section 3.3 are at least partially impounded, either by topographic features or beaver dams, generally have both an inflow and an outflow stream, and are either permanently or seasonally flooded. Vegetation is typically correlated with water depth and hydroperiod, soils, nutrients, chemistry, and energy (Kunze 1994). The typical vegetational progression landward from the water source include zones of rooted aquatic vegetation, emergent herbaceous vegetation, riparian shrubs, and then wet forest (if the wetland is forested). Examples of wetland-associated plants along this gradient include cattail, rushes, skunk cabbage, sedges, cottongrass, hardhack, willow, alder, black cottonwood, and western redcedar (Oakley et.al. 1985). Riparian plants in areas along wetlands and other water resources filter and trap pollutants, both mechanically and through uptake, as well as preventing erosion through extensive rooting (see Section 3.3).



Source: TRPC 2020c.

Figure 3.4-1. Thurston County Watershed-Scale Wetland Types and Percentages of Wetlands Within Watershed Area

As shown in Figure 3.4-1, the Black River watershed includes almost 8,000 acres of wetlands. Springs and groundwater inputs have formed large wetland complexes, many of which are associated with the Black River shoreline, that are unique in the area (Ecology 2019a). Wide corridors of wetlands form a mosaic of riparian areas and palustrine forested, scrub-shrub, and emergent wetlands that represent one of the largest remaining relatively undisturbed freshwater wetland systems in the Puget Sound region (USFWS 2016). The Black River watershed is the location of the only known area in which Oregon spotted frog occur in the study area, and it is one of only six such areas in Washington State. West Rocky Prairie, one of several known Oregon spotted frog-occupied sites in the study area, is an example of wetland habitat that should be protected and restored (Ecology 2019a).

Wetland Noxious Weeds and Invasive Wetland Species

Wetlands in the Black River watershed, as well as other locations in Thurston County, are threatened by non-native, invasive plants that are on the Thurston County noxious weed list (Table D-2 of Appendix D), including reed canarygrass, poison hemlock, purple loosestrife, and yellow flag iris. Of these species, reed canarygrass is the most prolific and the most threatening to habitat. Reed canarygrass grows densely along wetland margins and roots into submerged wetland soils; small, native, understory wetland plants are unable to compete against this thick, tall grass and wildlife is excluded from areas with heavy growth (USFWS 2016). Reed canarygrass is typically controlled with herbicides, but research into more effective yet practical methods to control reed canarygrass density in wetland habitats while minimizing impacts to aquatic residents is necessary (USFWS 2016). For example, the Benchmark Preserve HCP is studying the effectiveness of managed grazing on some monitored sites to restore wetland margins invaded by reed canarygrass (Krippner 2017).

3.4.2.3 Wildlife

Wildlife is a fundamental element of the complex prairie and wetland ecosystems of Thurston County. Many areas of the county include relatively extensive areas of contiguous forest cover, offering stable wildlife habitat. There are, however, areas of habitat loss, particularly in low-elevation, low relief areas where prairies and development both occur, that have led to severe wildlife population declines, resulting in the designation of species as special-status species and the subsequent development of the HCP.

Non-HCP Special-Status Species

Special-status species include those listed or proposed for listing by state or federal agencies as endangered, threatened, sensitive, or candidate. These species are listed by WDFW in their PHS Program. Priority species include, in addition to endangered, threatened, sensitive, and candidate species, vulnerable animal groups and vulnerable species of recreational, commercial, or tribal importance. Priority species are those for which conservation measures are typically embodied in County growth management and shoreline planning. Priority species, including state- and ESA-listed species, are described below and included in Table D-4 of Appendix D. In addition, TCC Table 24.25-5 identifies species that are important to Thurston County; these species are noted below where appropriate.

Fish and Aquatic Invertebrates

The complex marine and freshwater network described in Section 3.3 supports a diversity of priority and special-status fish species protected under the federal, state, and local regulatory framework described above. The native fish species of importance in Thurston County include Pacific salmon (Chinook, chum, coho, pink, sockeye), steelhead, bull trout, resident and anadromous cutthroat trout, whitefish, sculpins, dace, and Olympic mudminnow. The Puget Sound Chinook salmon, Puget Sound steelhead, and Coastal-Puget Sound bull trout are listed as threatened under the ESA and occur in one or more watersheds in Thurston County. All of Thurston County's marine nearshore is designated as federal critical habitat for Chinook salmon and the Nisqually Delta area is designated as critical habitat for bull trout. Designated critical habitat also includes portions of the Nisqually River for steelhead, Chinook salmon and bull trout, and the Deschutes River for steelhead. Chinook salmon and steelhead stocks within Thurston County are generally declining in abundance. While there are no local populations ESA-listed bull trout in Thurston County, individuals from other populations may use nearshore marine and estuarine habitats, and portions of the lower Nisqually River as foraging and overwintering habitats (USFWS 2015a). Abundance trends for non-listed salmonids vary by species and population. For example, chum salmon stocks in Thurston County are generally healthy and either stable or increasing, while coho salmon stocks have decreased in recent years. Coho salmon are particularly sensitive to water quality effects associated with urbanization and impervious surfaces (Tian et al. 2021). Thurston County has identified the Olympic mudminnow as a special-status species in TCC Table 24.25-5. This species is endemic to western Washington and dependent on protected lake and wetland habitats that are becoming increasingly rare, threatened by development, and vulnerable to invasive species. The complete list of special-status fish species in Thurston County is included in Table D-4 of Appendix D.

The nearshore marine environment of Thurston County, including its rock and sand beaches, extensive nearshore eelgrass beds, and estuarine mudflats host the endemic Olympia oyster, which has declined dramatically in abundance due to overharvesting, degraded water quality Washington State as a candidate species. Several other priority marine invertebrates are present in County waters, including the geoduck, butter, native littleneck, and manila clam, Pacific oyster, Dungeness crab, and Pandalid shrimp species (Table D-4 of Appendix D). These species and their habitats are not included in the HCP and their existing management and projected trends in species status are not likely to be measurably affected by the alternatives considered in this EIS.

Reptiles and Amphibians

In addition to the Oregon spotted frog, several special-status species of reptiles and amphibians have been documented in Thurston County, such as the Cascade torrent salamander, Van Dyke's salamander, western toad, and the western pond turtle (Table D-4 of Appendix D). WDFW considers these species to

be of the greatest conservation need in the Washington State Wildlife Action Plan. The Oregon spotted frog is a proposed covered species in the HCP and is further discussed below.

Birds and Upland Invertebrates

The affected environment is located in the Pacific flyway, one of the main north-south migratory routes for variety of bird species. The Pacific flyway extends from the arctic regions of Alaska and Canada to South America and is bounded on the west by the Pacific Ocean. Lower Puget Sound is both a destination for many species and a stopover for shorebirds and waterfowl during migration. Although there are some known migration corridors in Washington for active migratory waterfowl and raptors, little is known about the nocturnal migratory pathways of many perching birds, such as the Oregon vesper sparrow, that inhabit, even temporarily, the proposed permit area. In addition to migratory birds, resident marine, shore, and upland birds as well as raptors inhabit the varied landscapes of Thurston County. Special-status birds that inhabit Thurston County are included in Table D-4 of Appendix D. In addition to these bird species, the prairies and savannas of the proposed permit area, as well as prairies that extend beyond the permit area, host a variety of butterflies (upland invertebrates) including the Mardon skipper, Puget blue, valley silverspot, and Taylor's checkerspot; these invertebrates are included in Table D-4 of Appendix D. Taylor's checkerspot is discussed further below.

Mammals

Thurston County habitats range from marine shorelines to mountain peaks that provide habitat for a wide range of mammals, including bats. Special-status mammals range from Orca whales, listed as endangered on both the state and federal lists, to state endangered fisher. Table D-4 of Appendix D includes special-status mammals, including the Western gray squirrel, which is listed as threatened in Washington State, and the Mazama pocket gopher, which is listed as threatened at state level. Four subspecies of Mazama pocket gopher, three of which occur in the affected environment, are listed as threatened at the federal level. Of the mammals listed as special-status species in Appendix D, the Mazama pocket gopher, Western gray squirrel, fisher, Townsend's big-eared bat, and Orca whale are considered by WDFW to be species of greatest conservation need. Two additional candidate species are included on the list as well as seven priority species. The Mazama pocket gopher is further discussed below.

HCP Special-Status Species

Mazama Pocket Gopher

The three Mazama pocket gopher subspecies that occur in Thurston County—Olympia, Tenino, and Yelm—are listed as threatened at the federal and state levels. The gopher subspecies have been listed because habitat reductions have resulted in population declines. Habitat components that are important to species survival include relatively dry, loose soils and substantial herb growth. The USFWS correlated sites with gopher presence to soil type and categorized soils into "more preferred" or "less preferred" (Stinson 2020). They determined that habitats in the study area having "more preferred" soils are more consistently occupied than those that do not. Additional discussion of soils is included in Section 3.1 of this Draft EIS. Mazama pocket gopher subspecies show a preference for prairies with a relatively low density of rocks as well as for native prairie grasses and forbs, but they can live on a wide range of grasslands with high components of introduced forbs, such as clover, dandelion, and lupine (Stinson 2020). Population decline is a direct result of loss of these habitat features. More than 90 percent of historic prairie and savanna has been converted to agriculture or lost to development or conifer forest encroachment (Dunwiddie et al. 2006).

The three Mazama pocket gopher subspecies inhabit different areas of Thurston County and are generally separated by rivers, creeks, or lack of habitat corridors, which act as natural dispersal barriers

(USFWS 2015b). Other dispersal barriers, such as changes in soil type or texture or introduction of impervious surfaces, have been suggested as a causal relationship to the genetic difference seen in the covered subspecies (Stinson 2020). Current knowledge of species distribution is incomplete and largely based on opportunistic surveys of proposed development sites. Known species distribution is composed of small, reproductively isolated breeding groups distributed on fragmented patches of habitat vulnerable to development and other threats to the native prairie ecosystem (see Section 3.4.2.1).

The County considered a variety of land cover types as potential *Mazama* pocket gopher habitat where the land cover intersects prairie soil types. These potential habitat areas and soil types preferred by *Mazama* pocket gopher subspecies are included in Figure 3.1-3. Additional population and life history information on the *Mazama* pocket gopher subspecies are included in HCP Appendix B and critical habitat elements are further described in Appendix G to the HCP (Thurston County 2020f). Potential *Mazama* pocket gopher habitat within the permit area is 99,890 acres, of which 843 acres are federally designated critical habitat (79 FR 19711). Additional information on *Mazama* pocket gopher, its subspecies, and service areas are included in Appendix B to the HCP and information on critical habitat elements are included in Appendix G to the HCP.

Taylor's Checkerspot Butterfly

Taylor's checkerspot butterfly is an endemic Pacific Northwest species that is listed as endangered at the federal and state levels. The butterfly, a subspecies of Edith's checkerspot, is medium sized with a striking checkered pattern of orange to brick red, black, and cream (Potter 2016). A previously wide-ranging butterfly that occurred abundantly between British Columbia, Canada, and Oregon's Willamette Valley, loss of habitat has resulted in a few isolated populations with few individuals (Stinson 2005). The population in the proposed permit area inhabits prairie habitat in Thurston County where the species was actively reintroduced into managed habitat (Linders et al. 2015). The butterfly requires short stature grass, such as the fescue that dominates the native prairie, and thrive in areas where there is topographic and vegetative variety, such as the upland prairie and oak savanna (Stinson 2005). Taylor's checkerspot butterfly habitat can be compatible with habitat for each of the other covered prairie species but are only likely to occur on and near the known reintroduction sites. Within their geographic range, the butterfly completes one life cycle annually, emerging from larval stages to fly as an adult butterfly between April and early June. With an average one-week adult life stage, it disperses over short distances up to several hundred meters (Kaye et al. 2011) from the emergence location (Potter 2016). After emergence, adults mate and lay eggs. The resulting larvae live in loose silk webs for three stages as caterpillars, then hibernate at or near the soil surface over winter. Plants identified for each butterfly life stage, such as the plants preferred for egg laying, host plants for larvae, and nectar sources for larvae, are included in Table 2.4 of the HCP.

Threats to Taylor's checkerspot butterflies that led to listing include habitat fragmentation as a result of agriculture and housing development and through increasing abundance of invasive grasses and shrubs that outcompete larval host plants (78 FR 61452-61503). Stinson (2005) notes that rainstorms can wash eggs or small larvae from host plants. The eggs can be inadvertently eaten or crushed by herbivores, including pocket gophers, or parasitized by wasps and flies. Conservation of the species is best achieved through habitat preservation where populations occur and with outplanting of other populations (Potter 2016). Existing Taylor's checkerspot butterfly habitat is on habitat reserves where habitat is managed for the species, primarily by WDFW. Over the next 30 years, potential Taylor's checkerspot butterfly habitat within Thurston County is expected to cover 2,424 acres, of which 1,481 acres are outside of habitat for *Mazama* pocket gopher subspecies, and 1,053 acres are federally designated critical habitat (78 FR 61506-61584). This species has benefited from successful reintroduction efforts and associated habitat management in existing habitat reserves. Planned actions include sustaining existing populations in habitat reserves, exploring additional opportunities for reintroduction, and

increasing the availability of the native food plants used by this species. Additional information on Taylor's checkerspot butterfly is included in Appendix B to the HCP and information on critical habitat elements are included in Appendix G to the HCP.

Oregon Vesper Sparrow

The Oregon vesper sparrow, a medium- to large-sized bird with a chestnut or rufous shoulder patch, white edges on its outer tail feathers, and white-ringed eyes (Altman 2015), has been classified by the Washington State Fish and Wildlife Commission as endangered (WAC 220-610-101). Altman et al. (2020) note that Oregon vesper sparrow habitat includes a dry, grass-dominated, structurally diverse, open landscape with few trees or shrubs; a mix of short herbaceous vegetation is typically chosen for foraging, moderate vegetation for nesting, which typically occurs on the ground, and taller vegetation for cover and singing perches. Within the permit area, suitable habitat is found in areas of open prairie and, to a lesser extent, oak savanna. Occasionally, pastureland has been found to be suitable breeding habitat in the south Puget lowlands, including the study area.

The study area is used for nesting, foraging, and cover; overwintering occurs in California. Migration to California occurs between August and September, with the return to the study area occurring between April and May. Overwintering habitat is located outside of the study area and, therefore, is not included in this analysis. Foraging includes a wide variety of insects, supplemented with grass and forb seeds. Vesper sparrows breed at one year and build a nest of grasses and rootlets in a shallow depression next to a clump of vegetation or at the base of a small tree or shrub between mid-May and mid-July; nests include clutches of three to four eggs that experience a hatch rate of 67 percent (Altman et al. 2020).

Similar to other prairie-dependent species, habitat loss and degradation has been responsible for population decline over the past decades. By the 1990s, habitat was restricted to the edges of open prairies and airports; habitat today is primarily available only in conservation areas of JBLM and Tenalquot Prairie Preserve (Altman et al. 2020). As noted in Appendix B to the HCP, other potential factors include higher nest predation in fragmented habitat, human disturbance during the nesting season, genetic and demographic factors associated with small population size, and possibly neonicotinoid pesticides (Thurston County 2020f). The south Puget Sound area is known to include 150,000 acres of prairie soils and only 12,500 acres remain undeveloped that have more than 25 percent native vegetation (Chappell et al. 2001). Potential Oregon vesper sparrow habitat within the permit area is 6,064 acres, of which 1,478 acres is outside of habitat for *Mazama pocket gopher* subspecies (Thurston County 2020f). Additional information on the Oregon vesper sparrow is included in Appendix B to the HCP.

Oregon Spotted Frog

The Oregon spotted frog, a medium-sized true frog, is listed as threatened at the federal level and endangered at the state level. Typical individuals of the species are olive, brown, or brick red and have large, irregularly shaped spots on the back, sides and legs, upward-oriented blue-green eyes, pointed snout, white lip line, an eye mask, and red or orange pigment on the lower abdomen and undersides of the hind legs (McAllister and Leonard 1997). With an estimated range loss between 79 and 90 percent, remaining populations persist in six Washington river drainages, including the Black River drainage in Thurston County (Hallock 2013).

Oregon spotted frog is a highly aquatic species that conducts all life stages in or immediately adjacent to perennial standing-water habitats. Habitat includes palustrine wetland complexes greater than 10 acres in size connected to riverine systems (Cushman and Pearl 2007). The perennial creeks (Table 3.3-1) in the Black River drainage and the associated network of intermittent tributaries include these habitat features and provide connectivity between Oregon spotted frog breeding sites, active season habitat, and overwintering habitat. Stream-associated wetlands that are known Oregon spotted frog habitat

include aquatic bed, emergent, scrub-shrub, and forested wetlands, although seasonally inundated margins of hay fields and pastures as well as springs, ponds, irrigation canals, and certain roadside ditches as connected systems have been shown to support some Oregon spotted frog life stages (Cushman and Pearl 2007). Still waters, instead of flowing waters, are typically chosen by the Oregon spotted frog. Oregon spotted frog life stages, along with required habitat for each life stage, and life-stage vulnerability are included in Table 3.4-1 below. As shown in Table 3.4-1, all Oregon spotted frog life stages are known to prefer an aquatic habitat-vegetation association that includes sedges, rushes, and hardhack (Hallock 2013).

Table 3.4-1. Four Key Life History Stages, Required Habitat, and Vulnerabilities of Oregon Spotted Frog

Life Stage and Life History Period	Required Habitat	Vulnerability
Breeding: March 15 – April 30 Breeding begins in February or March and is based on a combination of day length and water temperature.	Breeding frogs gather in seasonally flooded margins and shallows of emergent wetlands that receive minimal shading from vegetation. Sedge/rush habitats are preferred. Females deposit eggs in shallow temporary pools, gradually receding shorelines, benches of seasonal lakes and marshes, and wet meadows. Egg-laying sites tend to be temporarily wet but connected to permanently wetted areas through surface water.	Egg masses are sensitive to changes in water levels and temperature that, in turn, result in developmental vulnerability: exposure to predation or risk of desiccation. Freeze damage is common. This is the most sensitive reproductive stage for the species.
Rearing: April 1 – August 31 Frog eggs hatch and tadpoles develop throughout the summer, finally metamorphosing into juvenile frogs. Growth is rapid to adult size.	Tadpoles move to rearing habitat: interconnected networks of streams, ponds, and wetlands. Tadpoles graze on plant tissue, bacteria, algae, detritus, and carrion.	Egg hatching is extremely sensitive to water temperature and oxygenation. Tadpole survival is greatly affected by water level and predation; survival increases as tadpoles grow and gain access to mature aquatic vegetation for cover.
Pre-wintering: September 1 – October 15 Juveniles and adults may move from wetlands associated with breeding and rearing to overwintering sites	Adults prefer perennially deep pools with moderate hardhack-dominated native vegetation, but also including grasses, sedges, and rushes. Adults are opportunistic predators.	Little is known about survival in this stage; studies indicate that survival is lower than the adult stage.
Overwintering: October 16 – March 14 Adults move from deeper, permanent pools to areas close to their former breeding range during the wet season; dense vegetation in shallow ice-covered water is preferred during cold weather.	Overwintering adults prefer flowing streams or springs with well-oxygenated water. Some overwintering habitat may be semi-terrestrial.	Frogs remain relatively inactive and are vulnerable to exposure via desiccation, suffocation, and freezing.

Sources: McAllister and Leonard (1997); Cushman and Pearl (2007); Hallock (2013).

Oregon spotted frogs are generally limited in their movements, averaging approximately 1,300 to 2,600 feet throughout the year, with extremes up to 1.7 miles; frequency of movement is positively correlated with pool proximity (Cushman and Pearl 2007). Hallock (2013) notes that the primary factors affecting continued existence in Washington are the isolated nature of populations (low dispersal area and resulting genetic health) coupled with habitat loss and degradation. Other factors for decline include invasion of non-native flora and fauna, namely reed-canary grass, as described above, which Oregon spotted frog populations tend to avoid. Other water-borne invasive plants that could affect Oregon spotted frog habitat are identified in Table D-5 of Appendix D.

Potential Oregon spotted frog habitat within the study area occurs in the perennially saturated areas, especially wetland margins within an area modeled by USFWS and the County as the OSF Habitat Screen, which includes 39,493 acres. The screen is used with on-ground validation of wetland habitat, and necessarily overestimates the habitat area. In the affected environment, 4,773 acres are federally designated critical habitat (81 FR 29335 29396). While habitat for the Oregon spotted frog does occur among the prairie and forest landscapes, the habitat occurs in a mosaic with other land cover types. Models indicate that 15,005 acres of Oregon spotted frog habitat overlap Mazama pocket gopher habitat (Mazama pocket gopher soils) (Figure 3.1-3). Existing local, state, and federal regulations are generally effective at protecting remaining Oregon spotted frog habitats from development-related impacts. The primary threats to this species are ongoing habitat degradation caused by invasive plants, introduction of non-native predators—particularly bullfrogs—, and stormwater pollutants. Additional information about the Oregon spotted frog life history and habitat requirements are included in HCP Appendix B, and critical habitat elements are further described in Appendix G of the HCP.

USFWS has provided funding through the Cooperative Endangered Species Conservation Fund to the City of Yelm and the City of Tumwater in cooperation with Port of Olympia to develop an HCP covering their jurisdiction in Thurston County. The latter, if permitted, would also provide a conservation program for Oregon spotted frog. Because this action would be evaluated under a future NEPA analysis and there is no ITP application or available details of such an HCP, it is not considered further in this analysis. We know of no other planned actions related to this species in the affected environment.

3.4.3 Environmental Consequences

The analysis in this section evaluates the potential effects of permit issuance and the approval and implementation of the Thurston County HCP and the alternatives that may affect plants and animals. The County and USFWS have determined that an alternative could have significant adverse impacts on plants and animals if implementation would result in a change in species status or reduce the likelihood of survival or recovery in the wild. This analysis considers the reasonably foreseeable environmental trends and planned actions (collectively described above as the affected environment) together with each alternative in order to assess the environmental effects of the alternatives related to plants and animals.

The Thurston County HCP is intended to provide the County with incidental take coverage for the species that are addressed in the HCP. The level of incidental take has been quantified for covered activities identified in the HCP (see Table 2.1-1) to meet permit issuance criteria. Impacts to these species are described using habitat surrogates quantified by the County for the purpose of the HCP, which was developed with extensive assistance from USFWS technical staff. Impacts to other special-status species not addressed in the HCP, as well as sensitive habitats, are discussed qualitatively.

As discussed in Section 2.1.3.4, habitat surrogates are used to quantify impacts to species where it is not possible to reliably count the number of individual animals that are present in a given area and/or that may be impacted by a permitted action. For example, animals such as Mazama pocket gophers, which are small and patchily distributed and that spend most of their lives underground, are particularly difficult to count. These characteristics make it effectively impossible to predict how many individuals of each subspecies may be impacted over the 30-year term of the ITP. Habitat impacts are an appropriate surrogate for quantifying impacts to Mazama pocket gophers because Mazama pocket gophers have very specific habitat requirements, the amount of habitat needed to support viable populations can be predicted, and habitat impacts are easily measured. This allows managers to set clear and enforceable standards for quantifying take and avoiding and minimizing adverse impacts. As such, the HCP would by necessity rely on habitat surrogates to manage this species.

All of the species covered under the HCP are similarly difficult to count based on their biological characteristics but impacts to species can be quantified through the use of habitat surrogates.

Incidental take impacts, therefore, are quantified based on projected habitat impacts associated with each covered activity. Methods for projecting habitat impacts are based on soil types and associated occupancy for *Mazama* pocket gopher subspecies (HCP Table 4.1), habitat quality and function for Oregon vesper sparrow and Taylor's checkerspot butterfly (HCP Tables 4.2 and 4.3), and a mix of known and potential habitat for Oregon spotted frog. When compared to covered activities, these habitat values provide a calculated impact area for each activity that is reported in the HCP as "functional acres." Functional acres for each covered activity are reported in HCP Tables 4.4 and 4.5. The assessment of impacts included in this section associated with implementation of the Proposed Action and alternatives relies on the following assumptions and statements included in the HCP.

- Impacts associated with most covered activities would permanently eliminate all habitat within the activity footprint.
- Covered activities (individual activity footprint) would be sited and designed to avoid or reduce impacts to covered species and their habitats.

Using the habitat surrogate approach, potential effects of each alternative on proposed covered species are evaluated based on differences in the projected extent of impacts on prairie/oak woodlands and wetland/riparian habitats. The following subsections explore the relationship between habitat loss or alteration from covered activities on covered species associated with these habitat types under each of the alternatives.

The Thurston County HCP requires implementation of certain take avoidance and minimization measures. Additionally, the HCP requires implementation of mitigation measures when take cannot be avoided. Avoidance and minimization measures are incorporated into covered activities as BMPs (HCP Appendix C). BMPs are discussed for each action alternative and avoidance, minimization, and mitigation measures as they relate to Plants and Animals included in the HCP are discussed at the end of this section. Avoidance, minimization measures, and mitigation included in the HCP would apply to both action alternatives, but the conservation network would be slightly altered for the Modified HCP Alternative at the completion of this process if that alternative is chosen.

3.4.3.1 No Action Alternative

Under the No Action Alternative, no incidental take authorization (Section 10(a)(1)(B) permit) would be issued to Thurston County by USFWS and no comprehensive HCP would be adopted by the County or implemented. Land and infrastructure development, and building by the public and private sectors, would continue as projected (see Section 2.1.1.4) by Thurston County. Without a Section 10(a)(1)(B) permit, incidental take of ESA-listed species would have to be avoided; each proposed project would be reviewed on a case-by-case basis, either through small-scale habitat conservation plans for private, non-federal actions, or through Section 7 consultations with a federal nexus.

County-permitted development projects and County infrastructure activities in Thurston County would result in both permanent and temporary habitat impacts. Activities such as residential and commercial development; County-permitted project construction; road construction and maintenance; water resources management; and parks and trails maintenance would result in impacts to non-ESA-listed plants and animals through conversion of habitat to structures, roads, and maintained areas; individual mortality from construction equipment; and habitat abandonment as a result of disturbance.

Existing conservation efforts would continue, and other planned species conservation actions would likely occur under the No Action Alternative. These existing efforts include other approved HCPs; conservation efforts by WDFW, WDNR, and others on existing reserves; and NRCS habitat conservation programs on working lands. These activities are expected to continue and, therefore, do not represent additional planned actions.

Impacts to Prairie Habitat and Prairie Species

Prairie habitat, the analysis surrogate for prairie wildlife populations, primarily includes the vegetation of the oak woodland ecosystem described in Section 3.4.2. Prairie habitat, and by extension prairie species, could be lost or degraded as a result of development activities. Under the No Action Alternative areas that are occupied by ESA-listed species would be avoided in development activity planning and permitting. Avoidance areas associated with ESA-listed species would include 11.2 percent of the 76,475 acres of prairie habitat known to provide vegetation and soil types preferred by species addressed in this EIS. Outside of this avoidance area, but within the entire Thurston County study area, screening for ESA-listed species or habitats, or areas within the jurisdiction of the Thurston County CAO, would be required as part of individual project review prior to permitting. As noted, screening for presence of ESA-listed species would be a permitting requirement, and avoidance of those species would be required. Development activities would be allowed in areas that are not occupied by ESA-listed species and that include habitat that could support other prairie species. This impact analysis, therefore, explores loss of those habitats.

The primary impact mechanisms under the No Action Alternative for prairie habitats and species include loss of species diversity, habitat fragmentation, and invasive species introduction and spread. Loss of prairie grasses and direct impacts to prairie soils could displace individual animals and isolate breeding populations. Disturbances and habitat degradation outside of occupied prairie habitat could also sever dispersal corridors, further contributing to habitat fragmentation.

Loss of suitable prairie habitats could continue to occur, even when development actions are restricted to unoccupied habitats. Construction equipment activities that disturb and compact soils and the construction of roads, trails, driveways, and other features could sever dispersal corridors and further limit opportunities to occupy those habitats in the future. Fragmentation of unoccupied habitats could also limit the seed dispersal for native prairie vegetation species, which would further limit the ability these plant communities to persist in the future. Non-covered wildlife species present in these development areas could be crushed by vehicles, trampled, dug up, or buried by grading during County development and infrastructure activities. Roadway maintenance could eliminate forage for many prairie species through mowing during the growing season. Development activities that remove prairie vegetation could also lead to mortality when habitat is fragmented into patches and forage is removed. Grading, filling, contouring, and other ground-disturbing operations reduce the extent and functions supported by the affected habitat, resulting in fragments of viable habitat.

A large threat to the prairie habitat system is the introduction and spread of invasive species and increases in woody plants and trees that displace native plants and animals. Development-related disturbance could increase the density and abundance of non-native grasses and forbs that could outcompete the native prairie grasses that prairie species rely on for forage and are essential to life stages. Certain invasive species, such as Scotch broom, can alter soil chemistry and create conditions that are unsuitable for native prairie grasses (Dennehy et al. 2011). In addition to the potential proliferation of Scotch broom, ground-disturbing activities and vehicular and equipment use associated with development activities would provide opportunities for the introduction and spread of other noxious weeds that could result in loss of native habitat, reduction of native plant diversity, changes in community functions, and loss of system-dependent wildlife species. In addition, residential

development typically results in the introduction of domestic pets and agricultural activities typically bring livestock. Both activities result in the potential for the introduction of disease to native wildlife populations and increased predation.

Development would occur with or without the Thurston County HCP over the next 30 years. The location and site-specific details of individual development activities over that time frame cannot be predicted. The type and magnitude of those development activities are informed by the anticipated level of buildout at the county scale and the zoning of individual parcels. As indicated in Table 3-1, it can be assumed that 9,221 acres of habitat for ESA-listed species and other species important to Thurston County would be excluded from development under the No Action Alternative. This is the estimated extent of occupied habitat that would be excluded from development unless the project proponent applies for an ITP or develops an individual HCP. Every development project would have to determine species occupancy and develop specific plans to avoid, minimize, and mitigate impacts to covered species. These requirements lengthen and complicate the project approval process and influence the pace of development. Developable lands would tend to lie dormant for longer periods and would likely remain unmanaged. Unmanaged prairie habitat allows for encroachment of forest and invasive species, resulting in the potential for ongoing species decline.

Development that does occur within prairie habitats under the No Action Alternative would include species-specific avoidance measures. Take of state-listed or ESA-listed species may be authorized by WDFW or USFWS, respectively. However, if any individual application were projected to result in species take, such future approvals are not assumed in this analysis (see Section 2.1.1.2). The coordinated conservation strategy of the Proposed Action, including the benefits of large, contiguous blocks of habitat, would not be realized, and development could commence without preservation of habitat for listed species. Mitigation for CAO resources would still occur as required by existing local and state regulations but would not be managed comprehensively under a conservation lands program. The lack of coordinated management is likely to result in incremental habitat degradation due to fragmentation and isolation, non-native species invasions, forest encroachment, and other stressors. Based on observed trends in Thurston County, the continuation of existing regulatory and mitigation mechanisms under the No Action Alternative would not likely provide for the effective conservation of covered and non-covered species that depend on prairie habitats. This is a primary motivation for the development of the HCP.

Impacts to Wetland/Riparian Habitat

Oregon spotted frog wetland/riparian habitat in the Black River drainage is interspersed with Mazama pocket gopher soils and some pockets of woodland/savanna communities. As noted in Section 3.4.1, this habitat, described in the HCP as the OSF Habitat Screen, includes 39,493 mapped acres.

Wetland/riparian habitat for the Oregon spotted frog would be impacted in a similar manner to the prairie habitat, including habitat loss and degradation resulting from development activities that would result in loss of species diversity. The aquatic habitats that support the Oregon spotted frog are susceptible to hydrologic change and past water-quality degradation; population losses of the Oregon spotted frog have been directly linked to hydrologic alteration and direct wetland filling. The Thurston County Critical Areas regulatory framework protects aquatic resources by creating a disincentive to develop critical areas with comprehensive mitigation requirements and maintains aquatic resources in a no net loss stance. Past landscape-scale hydrologic alteration has included a change from seasonal wetlands to permanent waterbodies, thus affecting the Oregon spotted frog life stages that rely on a fluctuating hydrologic regime. Fertilizers, pesticides, and herbicides, as well as other pollutants related to development and agriculture, also affect the aquatic environment used by the Oregon spotted frog.

In addition to historical hydrologic alterations, Oregon spotted frog populations are vulnerable to habitat fragmentation that could occur as a result of development activities that convert habitat to

developed land uses, including general construction and road maintenance actions that reduce the extent of inundation. Breeding success can be significantly impacted when alteration occurs between maturation and overwintering sites and the known or nearest breeding site, all of which are strongly linked to aquatic corridors. Habitat fragmentation that results in aquatic corridor modification can include direct habitat alteration, loss of emergent vegetation necessary for some life stages, or the introduction of non-native plants and wildlife predators. Oregon spotted frog populations are vulnerable to non-native and invasive species that alter vegetation necessary for specific life stages, compete for habitat, or are outright predators. Like the prairie habitat, vegetation changes to wetland/riparian habitat can occur due to infringement of woody species and noxious weed introduction or spread that may occur as a result of covered activities and as a result of wetland hydrologic changes described above. Species such as reed canarygrass, a species not preferred by the Oregon spotted frog, take over wetland native vegetation and become dominant. Transportation and maintenance activities include mowing and trimming vegetation that can spread invasive species through seed or cuttings spread during cutting and trimming or along disposal transportation routes via wind. Maintenance activities at tops of ditch banks, along culvert inlets and outlets, and open drainages can facilitate the spread of invasive vegetation. Invasive plant fragments and seeds that collect in beaver dam impoundments can be inadvertently dispersed by beaver dam management. Structural repair in streams and watercourses can mobilize invasive plants and animals, especially those with a close water-margin vegetation relationship. Historic wetland modifications have also facilitated the spread of non-native fish and American bullfrogs. The conversion of seasonal wetlands to more permanent waterbodies tends to favor the American bullfrog, which allows this aggressive species to outcompete the Oregon spotted frog. A variety of non-native fish, such as successful predators like sunfish and bass, are now established across the Oregon spotted frog habitat (Cushman and Pearl 2007).

Under the No Action Alternative, 618 acres of OSF Habitat Screen that may be impacted under the action alternatives, and which is a mosaic with other land cover types, would be avoided as development progresses in Thurston County. As with prairie habitat, any development or maintenance project would require permits on a project-by-project basis. Wetland/riparian habitat is managed through the Thurston County Critical Areas code which includes provisions for no net loss of resources, as well as the county's Shoreline Master Program. In addition to County-level wetland or wildlife habitat conservation area permits, WDFW permit approval is required for projects that would alter the bed or flow of a stream. While these regulations ensure no net loss of total wetland area and restoration of streams, they do not include general measures for maintenance of habitat features that are essential to the Oregon spotted frog, such as rush, sedge, and other emergent vegetation and gradually receding shorelines. Project-based mitigation typically requires restoration of wetland/riparian habitat with woody vegetation and hydroperiod maintenance that results in permanent, deep pools that preclude emergent habitats necessary for Oregon spotted frog life stages. Absent the HCP, which would protect habitat features, and even considering the slower pace of development under the No Action Alternative, the existing regulatory structure, absent HCP-based code modifications that would occur with HCP adoption by the County, may not, over the next 30 years, prevent further decline of the species due to loss of required habitat features and connecting corridors.

Ongoing County activities under the No Action Alternative are not likely to measurably affect the extent and quality of existing Oregon spotted frog habitat. However, the incremental loss and degradation of suitable habitat caused by invasive plant and animal species would continue to intensify and lead to localized negative effects on this species.

Impacts to Designated Critical Habitat

USFWS defines designated critical habitat as the specific areas within the geographic area, occupied by the species at the time it was listed, that contain the physical or biological features that are essential to

the conservation of endangered and threatened species and that may need special management or protection. Designated critical habitat may also include areas that were not occupied by the species at the time of listing but are essential to its conservation. This analysis assumes that all designated critical habitat would be avoided under the No Action Alternative as a prudent take avoidance measure. There are no known planned actions that are likely to adversely affect critical habitat for Oregon spotted frog.

Impacts to Special-Status Species

Several wildlife species on the Washington State list of threatened and endangered species are known or likely to occur in the study area, as are several ESA-listed or State-listed plants (Table D-4 of Appendix D). In addition, several species of migratory birds and other avian species occurring in the study area are protected under other federal regulations as described in the regulatory framework subsection of the introduction. Environmental impacts to non-HCP species and their habitats resulting from the construction and operation of future development activities under the No Action Alternative would be evaluated on a project-by-project basis pursuant to local and state regulations, including SEPA. Existing local requirements may not avoid all impacts to these species, unless specifically prohibited.

Under the No Action Alternative, special-status species would not benefit from a managed conservation program and may experience declines in habitat quality and function.

3.4.3.2 Proposed Action

For Plants and Animals, under the Proposed Action, covered species and habitat effects associated with County-permitted development projects and County infrastructure activities are examined assuming implementation of the Thurston County HCP. All covered activities implemented under the Proposed Action include activity-specific BMPs designed to reduce impacts to covered species, which would also reduce impacts to other plants and animals. These BMPs are detailed in Appendix C of the HCP.

Similar to the No Action Alternative, prairie and wetland loss and disturbance would result from development and maintenance activities implemented under the Proposed Action. Unlike the No Action Alternative, the Proposed Action would realize habitat benefits from a managed conservation program. The Proposed Action differs from the No Action Alternative by improving planning certainty throughout the County's jurisdiction whether or not a particular site is occupied by covered species, streamlining covered activities in habitat modeled for covered species by eliminating pre-project surveys for ESA-listed species occupancy and providing mitigation to fully offsets the impacts of the taking on covered species. The streamlined project approval process and improved certainty provided by the ITP and the No Surprises assurances would maintain the County's ability to meet growth demands, similar to the No Action Alternative. The implementation of the Thurston County HCP, which includes targeted impact avoidance and minimization measures, specific mitigation requirements, and a detailed habitat conservation strategy for protected lands, is likely to lead to more effective conservation of covered species over the next 30 years. The Proposed Action differs from the other action alternative in its composition of conservation lands. These elements are evaluated further below.

Impacts to Prairie Habitat and Prairie Species

Modeled prairies and grasslands in the study area providing potentially suitable habitat for mazama pocket gopher comprise an estimated 67,987 acres. Within this area, the Olympia pocket gopher may occur on 9,271 acres, the Tenino pocket gopher on 6,669 acres, and the Yelm pocket gopher on 52,047 acres. Approximately 2,424 and 6,064 acres of suitable habitat for Taylor's checkerspot butterfly and Oregon vesper sparrow overlap the Yelm pocket gopher habitat, respectively.

The HCP provides an estimate of the acres of habitat for each covered species that are likely to be impacted by covered activities over the life of the HCP (Table 3-2). Those impacts were initially estimated using

maximum-areal extent of the covered activity (e.g., typical development footprints by zoning category), without consideration of avoidance and minimization measure implementation or indirect benefits. As such, the habitat impact acreage represents a worst-case scenario. Under the Proposed Action, covered activities were estimated to impact 8,603 acres of habitat for prairie species, including Mazama pocket gopher subspecies, Oregon vesper sparrow, and Taylor's checkerspot butterfly over the 30-year life of the HCP. These quantified impacts for each covered activity would result in permanent habitat loss, with the exception of certain maintenance activities and septic system repair or alteration that would result in temporary impacts (Table 2.1-1).

The Proposed Action would include the same activities as the No Action Alternative and would result in similar impacts, but developers would no longer be required to determine whether the affected habitats are occupied by covered species. As such, the site-specific locations of covered activities would vary in terms of location and in terms of impacts to ESA-listed species, compared to the No Action. Detailed impacts to covered species that are primarily associated with prairie habitat, broken down by activity, are included in Tables 4.4 and 4.5 of the HCP. While individual development activities could be permitted more quickly, we anticipate development at the countywide scale will proceed at a similar pace to the No Action Alternative because this is driven by human population growth. Individual project reviews in modeled habitat for covered species would be streamlined, including projects that would not have been considered under the No Action Alternative. Compared to the No Action Alternative, which would avoid impacts to habitat for covered species, the Proposed Action would include USFWS issuance of an ITP that would allow covered activities to occur in habitat areas occupied by covered species. Development impacts on soil and vegetation that would affect the Mazama pocket gopher subspecies covered under the HCP would be similar to those of the No Action Alternative but would occur in occupied habitat, resulting in unavoidable impacts to individuals of the covered species. These same activities could also impact individual Oregon vesper sparrows where land clearing takes place in occupied areas during the nesting season; as nesting typically occurs on the ground, eggs and nestlings could be lost, or nests could be abandoned. While Taylor's checkerspot butterfly reintroduction areas would be avoided, removal of native prairie grasses as a result of these covered activities would affect all life stages in prairie habitat adjacent to these areas.

In addition to timing and degree of effects, the primary difference between the Proposed Action and the No Action Alternative is that the Proposed Action would influence where development is allowed to occur and would implement a conservation program to maintain and increase the value of protected habitat. The conservation program was designed to fully offset the impacts of the taking on covered species from habitat loss or disturbance resulting from covered activities. Full offset would be achieved by permanently protecting an equal number of functional habitat acres. Under the Proposed Action, mitigation would consist of approximately: 2,079 acres of new habitat reserves for the covered Mazama pocket gopher subspecies; enhancement of 298 acres of existing reserves for the Yelm pocket gopher; enhancement of 40 acres of existing reserves for Taylor's checkerspot butterfly; 401 acres of working-land easement for the Tenino pocket gopher and the Yelm pocket gopher, and; 31 acres of working-land easements for the Oregon vesper sparrow (Table 3-1). The conservation program for prairie habitat would protect and enhance native prairie grasses (Table D-1 of Appendix D) and manage prairie vegetation to prevent encroachment of woody species to ensure the long-term viability of prairie species. Some preservation and management activities of the conservation program could result in temporary impacts to habitats and species; temporary impacts could result in loss of some prairie wildlife and less mobile animals if they occupy enhancement, maintenance, or restoration sites or if plants or their soil seed bank are dug up, trampled, or buried during recontouring, revegetating, fencing, or other restoration activities. Overall, restoration and enhancement activities are expected to have a long-term beneficial effect on covered species populations.

Allowable development in prairie habitat would be incentivized to locate and design projects to avoid or reduce impacts of the taking on covered species to minimize the resulting mitigation burdens, with limits described in the HCP. Specific development envelopes have not been designated within any covered species habitats; however, minimization measures to site activities to avoid populations of covered species would be programmatically implemented, thereby minimizing losses, preserving the species, and avoiding reductions in species status. Though the take assessment associated with covered activities largely assumes permanent impacts in which all plants and animals would be lost within entire project footprints, some footprints would include designs to minimize impacts to prairie habitat and could result in the retention of small patches of prairie or grassland habitat mitigated as habitat loss due to the likely loss of habitat function from development, degradation, and fragmentation. The biological value of these remnant communities would be reduced due to their small size, their isolation, and the anthropogenic impacts from surrounding development, with the exception of those areas adjacent to conservation program lands, which would have the effect of expanding the conservation program's preservation of prairie species through thoughtful site design.

Habitat fragmentation and loss would result from covered activities. These impacts would be offset by the preservation and management of large, contiguous areas of native prairie habitat to be included in the conservation program, along with implementation of avoidance and minimization measures in the form of standard and enhanced BMPs that would apply to each covered activity. BMPs minimize impacts to prairie habitat by limiting the magnitude of covered activities; standard BMPs would be required and enhanced BMPs would be voluntary for landowners. Standard BMPs are enforceable measures for activity siting and for minimizing the extent of ground disturbance from construction-related activities, thus reducing ground-disturbing impacts described for the No Action Alternative. Activity-siting BMPs include further avoidance of prairie habitat and preferred gopher soils, aligning and clustering development envelopes and roadways to maintain the largest portion of existing habitat, thus preserving prairie vegetation, and maintaining habitat connectivity and avoiding habitat fragmentation. Construction-minimization BMPs include working within development envelopes only, managing stormwater, controlling erosion, minimizing soil compaction, storing and replacing native soils through the development process, controlling noxious weeds, and avoiding mowing the nectar species of the Taylor's checkerspot butterfly until after flowering and seed production. Enhanced BMPs provide guidance for voluntary removal of woody species that encroach into prairie habitats, removal of noxious weeds, control of domestic pets to prevent predation, planting butterfly pollinator and nectar/food plants, maintaining corridors of contiguous habitat, and minimizing derived landscaping plants while maximizing native prairie vegetation. Impacts to covered species habitat that remain after application of BMPs that require mitigation is a primary difference for Plants and Animals between the Proposed Action and the No Action Alternative.

The comprehensive monitoring program would provide the information necessary to ensure that required avoidance, minimization, and mitigation measures are being effectively implemented. The proposed program includes an adaptive management component that would allow the County to adjust mitigation and management measures as needed to ensure the biological goals of the HCP are achieved (HCP Chapter 6). The conservation strategy in the HCP (HCP Chapter 5) would avoid, minimize, and mitigate the impacts of the taking on covered species, providing equivalent offsets to other plant and animal species that occur in prairie habitats. The protection, restoration, maintenance, and enhancement of covered species in prairie habitat would mitigate the effects of covered activities, as described above, and would further provide for the conservation of other species in the prairie habitat of Thurston County. Compared to the No Action Alternative, the Proposed Action would result in species conservation and prevent further species decline. As such, the impacts of the Proposed Action on prairie species and prairie habitat would be less than significant.

In addition, the HCP would include perpetual monitoring and adaptive management of mitigation sites, so the expected outcomes are ensured against climate change spoiling their conservation role. The Proposed Action was developed with attention to the potential changes in the management of covered-species habitat.

Impacts to Wetland/Riparian Habitat

Under the Proposed Action, covered activities could impact up to 618 acres of the 39,493-acre OSF Habitat Screen over the 30-year life of the HCP (see HCP Table 4.5). As with the prairie habitat, landscape-scale projected impacts to wetland/riparian habitat that supports the Oregon spotted frog included a series of base assumptions primarily related to verification of habitat presence to inform site-specific planning for take avoidance, incentives to build away from seasonally flooded areas, and financial assurances for mitigation of unavoidable impacts. For most covered activities, impacts to the wetland/riparian habitat screen would be avoided in site design. Activities associated with public service facilities are not expected to incur impacts to wetlands and riparian habitat and, though exact locations for landfill and solid waste management are not known, eventual siting is not expected to affect Oregon spotted frog habitat. Detailed impacts to the Oregon spotted frog habitat screen, broken down by activity, are included in Tables 4.5 of the HCP.

Wetland/riparian habitat for the Oregon spotted frog would be impacted under the Proposed Action in a similar manner to the No Action Alternative but would vary in timing and intensity as described for prairie habitats and species. Development activities that are covered in the HCP would occur at a faster rate and many projects that would not have been considered under the No Action Alternative would be allowed to proceed. While the overall rate of development would likely remain similar at the county level, the HCP would likely influence the distribution of specific development projects and the pace of development in wetland/riparian habitat in the range of the Oregon spotted frog. Compared to the No Action Alternative, which would avoid activities in habitats occupied by Oregon spotted frog and would implement compensatory wetland mitigation consistent with regulatory requirements, the Proposed Action would include USFWS issuance of an ITP that would allow covered activities to occur in occupied wetland/riparian habitat.

In addition to timing and intensity, the primary difference between the Proposed Action and the No Action Alternative is the conservation program of the Proposed Action. The conservation program was designed to fully offset take of Oregon spotted frog resulting from the Proposed Action by preserving an equal amount of habitat for every acre negatively impacted under the HCP. Under the Proposed Action, conservation measures for Oregon spotted frog include minimizing impacts to the species; and protecting, enhancing, and maintaining new reserves. Minimizing impacts to the species primarily includes the implementation of BMPs for covered activities, controlling invasive species, and implementing CAO provisions for avoidance and minimization measures. One BMP to protect Oregon spotted frog habitat would be the establishment of SMAs along specific roads in the OSF Habitat Screen that are managed by the County. These are areas of habitat that are likely to be disturbed by covered activities and that support the Oregon spotted frog or are hydrologically connected to currently or recently occupied Oregon spotted frog habitat. SMAs are the highest priority areas for BMP implementation for the covered activities of regular transportation maintenance, roadside right-of-way management, beaver dam management, and water/wastewater management activities. As a BMP, the County will also maintain a beaver dam management plan to minimize habitat alteration and hydrologic changes in wetland/riparian habitat. Enforceable construction-related BMPs include completing construction during dry periods of the year, minimizing in-water work, restoring riparian vegetation with species preferred by the Oregon spotted frog, and minimizing beaver dam removal in SMAs for the Oregon spotted frog. The Proposed Action incorporate Enhanced BMPs, which include recommendations

to avoid removal of large wood from wetlands and streams and prioritizing removal of creosote structures. Primary invasive species control in wetland/riparian habitat would target reed canarygrass.

Impacts to Oregon spotted frog or their habitat that remain after application of BMPs require mitigation through permanent protection of habitat. This mitigation must be equivalent to the area of total habitat impact (HCP Table 4.9) for the Oregon spotted frog, resulting in a full offset of impacts. It is anticipated that mitigation would occur as part of the conservation program on a single new reserve within the Oregon spotted frog habitat screen. Full offset of the forecasted impacts would require 618 acres and would include lands within the Black River watershed. This land and would include a range of habitat types that support non-breeding, breeding, rearing, and overwintering life stages. Priorities for conservation would be lands that include breeding habitat and existing populations. Like the conservation program for prairie species, Oregon spotted frog populations improvements would likely occur over the short term because of habitat protection and over the long term from permanent habitat management. Compared to the No Action Alternative, the Proposed Action includes a program that would preserve habitat that supports Oregon spotted frog, and result in species conservation. As such, impacts of the Proposed Action on Oregon spotted frog would be less than significant. Considering foreseeable environmental trends and planned actions, the Proposed Action better supports outcomes for wetland/riparian habitat, including Oregon spotted frog habitat, than the No Action Alternative.

Impacts to Designated Critical Habitat

USFWS defines designated critical habitat as the specific areas within the geographical area occupied by the species at the time it is listed, on which are found those physical or biological features essential to the conservation of the species and which may need special management consideration or protection; and specific areas outside the geographical area occupied by the species (16 USC 1532(5)) if they are essential to its conservation. Potential impacts to critical habitat under the HCP are included in Table 3.4-3.

Table 3.4-3. Potential Impacts to Designated Critical Habitat Under the HCP

Covered Species*	Designated Critical Habitat		Covered Activity Affecting Designated Critical Habitat
	Acres in Permit Area	Maximum Acres Affected Under HCP	
TPG	400	54.2 (14% of critical habitat in permit area)	<u>Development</u> : 53 acres affected through potential development of 53 dwelling units. <u>Transportation and Maintenance</u> : Temporary effects from roadside maintenance of 1.2 acres.
YPG	443	47.2 (11% of critical habitat in permit area)	<u>Development</u> : 21.3 acres affected through potential development of 21.3 dwelling units in subunit 1-YPG-B and 16.7 acres (16.7 dwelling units) in subunit 1-YPG-B. <u>Transportation and Maintenance</u> : Temporary effects from roadside maintenance of 1.7 acres in 1-YPG-A and 1.9 acres in 1-YPG-B.
TCB	1,053	25.1 acres (2% of critical habitat in permit area)	<u>Development</u> : 23 acres (23 dwelling units) across seven subunits. <u>Transportation and Maintenance</u> : Temporary effects from roadside maintenance of 0.6 acres in subunit 1-B and 1.8 acres in subunit 1-D.
OSF	4,773 (7.5 linear miles)	76 acres (1.6% of critical habitat in permit area)	<u>Development</u> : 6.5 acres <u>Transportation and Maintenance</u> : Permanent displacement: 1.6 acres Temporary recurring impacts: 5.6 acres Linear habitat effects: 0.83 acres

* No designated critical habitat in permit area for the Olympia pocket gopher subspecies.

To issue an ITP, the federal agencies are required to avoid “destruction or adverse modification” of designated critical habitat, USFWS must evaluate impacts of the HCP on critical habitat. Under the Proposed Action, impacts to critical habitat would not exceed acreages shown in Table 3.4-3. All impacts to critical habitat would be mitigated within the same unit of critical habitat as part of the conservation program, with additional mitigation to permanently maintain and enhance remaining critical habitat function. With the activity limits and mitigation included in the HCP, impacts to critical habitat under the Proposed Action would not be significant.

Impacts to Special-Status Species

As described in Section 3.4.1.4, there are numerous special-status plant and animal species that are protected under the regulatory framework included in the introduction to this section and are known to or have the potential to occur in the study area. These species are not proposed for coverage under the HCP and, similar to covered species linked to specific habitats under the HCP, certain special-status species may be vulnerable to direct habitat loss and indirect habitat degradation from covered activities. The Proposed Action would likely result in 5,216 acres of habitat loss in the prairie habitats of the Mazama pocket gopher subspecies included in the HCP, Taylor’s checkerspot butterfly, and Oregon vesper sparrow; and 618 acres of wetland/riparian habitat loss that is suitable for Oregon spotted frog. These habitats overlap those of some of the special-status species listed in Table D-4 of Appendix D and could result in impacts to those that inhabit prairie/grassland or wetland/riparian habitats. As with HCP-covered species, some direct mortality may occur with vegetation clearing, soil disturbance, or typical water-quality changes associated with impervious surfacing. For example, ground-nesting bird species can be displaced, and nests and eggs can be destroyed by these activities. While these impacts are foreseeable, impacts to habitats vary by species, depending on when and where the activities occur and species-specific sensitivity to those impacts. Non-covered species may also be vulnerable to adverse effects from loss and fragmentation of suitable habitats.

Erosion and sedimentation are common byproducts of construction and can impact fish-bearing streams, and storm-event runoff can carry pollutants that decrease oxygen levels, impacting special-status fish and other aquatic organisms. Additional discussion of water quality and impervious surfacing associated with covered activities is included in Section 3.3. As with the covered species under the HCP, long-term impacts to special-status species could occur with introduction of invasive species or with avoidance behavior associated with development areas or new public facilities.

Covered activities under the Proposed Action would be required to implement avoidance and minimization measures and mitigation measures to protect covered species. These measures would have the additional benefit of reducing adverse effects on other special-status species that are not covered under the HCP. For example, the project siting, pre-construction survey, and protective requirements to avoid sensitive and valuable habitats are likely to be beneficial for any native species that depends on intact high-quality habitats. The conservation program of the Proposed Action does not include commitments or objectives to protect special-status species not covered under the HCP, but there are conservation goals and BMPs associated with specific covered activities that could serve to protect and conserve other special-status species. The Proposed Action includes conservation of 2,698 acres of prairie habitat on new reserves for the Mazama pocket gopher sub-species that would also protect a variety of special-status species and 618 acres of wetland/riparian habitat for Oregon spotted frog that would include habitat for other species. Enhancement of existing reserves and working-land easements, which cover 339 and 433 acres, respectively, could also be protective for other non-listed special-status species.

Long-and short-term impacts to non-listed special-status species could occur from covered activities and would occur regardless of HCP implementation. Impacts to non-HCP special-species and their

habitat resulting from the construction and operation of future development activities under the Proposed Action would be at least partially mitigated through the HCP's conservation program that would protect functional patches of prairie/grassland or wetland/riparian ecosystems. Compared to the No Action Alternative, the Proposed Action would result in better trends and outcomes for special-status species through the permanent protection of conservation lands. The degree to which each special-status species benefits from the Proposed Action would vary based on their preference for habitat features similar to those of the covered species. No significant impacts on special-status species are expected for these reasons. Impacts to special-status species, therefore, would be less than significant.

3.4.3.3 Modified HCP Alternative

Under the Modified HCP Alternative, as under the Proposed Action, USFWS would issue an ITP to Thurston County. The permit area, permit term, covered species, covered activities, and nearly all other elements of the HCP would be identical to those described for the Proposed Action. Mitigation for unavoidable impacts to covered species would be the primary difference as compared to the Proposed Action and would be provided only on 3,109 acres of new reserves (2,491 acres in prairie/grassland and 618 acres in Oregon spotted frog habitat) purchased from willing sellers. Working-land easements and enhancement of existing reserves would not be part of the mitigation strategy.

The approach to the Modified HCP Alternative is to apply the same credit yield for prairie habitat that would be derived for mitigation as that of the Proposed Action and only apply the credit yield to new prairie habitat reserves; the conservation lands program for Oregon spotted frog between the Proposed Action and the Modified HCP Alternative would remain unchanged. Because new reserves generate the highest habitat quality (i.e., mitigation credit-yield per acre) among the conservation options, and USFWS cannot require mitigation beyond fully offsetting the impacts of the taking, fewer acres of conservation lands would be enrolled under the Modified HCP. The total area for new prairie habitat reserves would be 2,491 acres managed to maintain high-quality habitat. Compared to the Proposed Action, which would include a total of 2,849 acres in its prairie habitat conservation lands program, of which 2,079 would be new prairie habitat reserves, the Modified HCP Alternative would include a smaller overall prairie conservation lands area (fewer acres in reserved habitat). The Modified HCP prairie habitat reserves would be primarily dedicated to the Yelm pocket gopher, the Olympia pocket gopher, and the Tenino pocket gopher (Table 3-2). Habitat reserves of 20 acres per species would be included in the program for Taylor's checkerspot butterfly and Oregon vesper sparrow.

As the Modified HCP Alternative conservation program includes only preservation of high-quality prairie habitat in new reserves, the pool of lands considered would be less diverse than under the Proposed Action. New reserves provide for large, contiguous habitat blocks that would benefit native prairie species over the long term. While this alternative would not enroll working agricultural lands in the conservation lands network, none of the species discussed above depend exclusively on agricultural land uses. The conservation lands network would be approximately 360 acres smaller than under the Proposed Action, but up to 422 acres more land would be on new reserves managed as high-quality native prairies. As a result, the action alternatives would provide equivalent conservation value to plants and wildlife. With a managed conservation lands program to fully offset the projected impacts of the taking of covered species from covered activities, impacts would be similar to the Proposed Action for covered species, prairie/grassland habitats, and special-status species. Impacts would be identical to the Proposed Action for designated critical habitats and for wetland/riparian species and habitats. Like the Proposed Action, these impacts would not be significant, due to the off-setting mitigation. After

analysis, we expect this alternative would provide an equivalent conservation value to covered species and to the non-covered plants and animals discussed above, as would result from the Proposed Action.

3.4.3.4 Avoidance, Minimization, and Mitigation Measures

As a condition of ITP issuance, ESA section 10(a)(2)(B)(ii) requires ITP applicants to minimize and mitigate the impact of the taking on covered species to the maximum extent practicable. Mitigation that fully offsets the impacts of the taking to covered activities would meet the section 10(a)(2)(B)(ii) ITP issuance criterion. ESA authorities do not enable USFWS to require mitigation beyond that which fully offsets the impacts of the taking. The mitigation for impacts to covered species proposed under each action alternative is designed to fully offset impacts of the taking on covered species and would also provide conservation benefits to other non-listed plant and animal species that rely on prairie or wetland habitats, as discussed above.

Avoidance and minimization for covered species are promoted in the action alternatives through application of BMPs. In the No Action Alternative, avoidance of ESA-listed species is promoted through project siting. The HCP conservation approach is summarized in Section 2.1.3 of this EIS and detailed in Chapter 5 of the HCP (Thurston County 2020f).

Under the Proposed Action, mitigation is achieved through permanent protection of prairie, grassland, and wetland habitats occupied by covered species. Conservation lands would total up to approximately 3,469 acres (HCP Table 7.7) and would consist of reserves and agricultural lands. Conservation lands would be prioritized in priority areas for the Mazama pocket gopher, though habitat for each covered species would be included to offset the impacts on each covered species. Additionally, the County would manage mitigation at a pace to remain ahead of the impacts to covered species.

For individual projects with unavoidable impacts to covered species, the project proponent would minimize impacts and pay mitigation fees to secure credits to offset the remaining unavoidable impacts; in lieu of mitigation fees, applicants may dedicate land for conservation, provided lands meet eligibility criteria detailed in the HCP. For applicants with unavoidable impacts to Oregon vesper sparrow or Taylor's checkerspot butterfly, minimization would be implemented, and mitigation fees would be ensured by the County. Mitigation fees would be used to compensate for impacts of habitat loss and disturbance by funding to fund acquisition of conservation sites and their permanent management.

As detailed in the HCP (Section 4.9), the net effect on covered species—considering projected take and mitigation—would be a full offset of impacts to covered species with mitigation in the form of protected habitat. Commensurate benefits to non-covered species dependent on prairie/grassland or wetland species would also result from HCP mitigation, as described in 3.4.3. As a result, HCP mitigation may also streamline compliance with local CAO procedures, eliminating the need for on-site analysis of certain critical area features on some projects.

In accordance with 40 CFR § 1502.16 and WAC 197-11-440(6)(c)(iii), this analysis considers other appropriate mitigation measures to address impacts to other plant and animal resources, summarized in Section 3.4.1. These local, state, and federal authorities set relevant regulatory mechanisms for protecting plants, animals, special-status species, and their habitats common to all alternatives. Nothing in this EIS is intended to limit the mitigation authorities of other agencies, should additional mitigation responsibilities be identified while planning, permitting, or carrying out individual activities.

3.5 Noise

The study area for noise includes all of Thurston County. Although the permit area for the alternatives only includes lands where the County has jurisdiction, activities on those lands may generate noise that

is audible in nearby areas, which may include portions of incorporated cities and tribal, state, or federal lands that lie outside the permit area.

Noise policies and ordinances exist at multiple levels in the study area. State transportation projects must comply with the Washington State Department of Transportation (WSDOT) Traffic Noise Policy and Procedures (WSDOT 2020a) and County ordinances described in TCC Chapter 10.36, Public Disturbance Noise. The incorporated cities of Olympia, Lacey, Tumwater, Yelm, Rainier, and Tenino have local noise ordinances, listed below:

- Olympia Municipal Code Chapter 8.32, Noise
- Lacey Municipal Code Chapter 16.57.030, Noise
- Tumwater Municipal Code Chapter 8.08, Noise Control
- Yelm Municipal Code Chapter 18.51.020, Noise
- Rainier Municipal Code Chapter 18.46.040, Noise
- Tenino Code of Ordinances Chapter 108.60.040, Noise

Noise ordinances identify noise-sensitive receivers and maximum allowable noise levels at those locations. In Traffic Noise Policy and Procedures, WSDOT adopts the criteria described in the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (FTA 2018), which includes definitions for noise-sensitive receivers. Typical noise-sensitive receivers are defined by land use, including high-sensitivity (e.g., outdoor amphitheaters, concert pavilions), residential (e.g., homes, hotels), and institutional (e.g., schools, libraries, theaters) uses (FTA 2018).

Information in this section is based on the TCCP (Thurston County 2020e) and the What Moves You Regional Transportation Plan (TRPC 2020f).

3.5.1 Affected Environment

This subsection describes reasonably foreseeable environmental trends pertinent to noise in the study area. Aside from individual County-permitted development activities and periodic updates to the TCCP, consistent with reasonably foreseeable environmental trends, no other planned actions specific to this environmental discipline have been identified.

Reasonably foreseeable environmental trends related to noise Thurston County include noise from ongoing activities at Joint Base Lewis-McChord (JBLM), urban areas, major roadways, and Olympia Regional Airport. Incorporated cities and their associated UGAs are the most densely populated areas within Thurston County and include residential, commercial, and industrial developments. Urban areas tend to have higher sustained noise levels than rural areas in the county. Generally, noise levels in Thurston County are expected to increase with population growth and urban development (Thurston County 2020e).

The following state and federal roadways are considered highways of statewide significance because they provide necessary connections between major communities: I-5, US 12, US 101, and State Route (SR) 8 (TRPC 2020f). These highways are the most heavily trafficked within the county and therefore also have the highest noise levels. Local and state agencies must address potential noise impacts associated with transportation projects.

The Olympia Regional Airport is located in the Tumwater UGA and is surrounded by an airport hazard overlay area. This area includes land uses that are compatible with airport activities that include high to moderate noise levels. JBLM is the largest military installation in Washington State and encompasses

over 90,000 acres. It is located east of Lacey and north of Yelm in both Pierce and Thurston counties. Most noise-generating facilities, such as McChord Airfield, are located within Pierce County, though loud sounds from training can be heard throughout the affected environment, and many training operations, including low-altitude flights, take place over unincorporated Thurston County (Thurston County 2020e).

3.5.2 Environmental Consequences

The County and USFWS have determined that an alternative could have significant adverse impacts on noise if implementation would result in a substantially increased rate of noncompliance with local noise ordinances. Noncompliance would occur if activities conducted or permitted by the County generate noise that exceeds allowable levels for noise-sensitive receivers. This analysis considers the reasonably foreseeable environmental trends and planned actions (collectively described above as the affected environment) together with each alternative in order to assess the environmental effects of the alternatives on noise.

Urban growth and associated development activities (including the activities described in Chapter 2) would continue to occur under all of the alternatives, and the alternatives do not differ in their requirements relative to noise. Therefore, all alternatives could have the following noise impacts:

- Equipment noise during construction
- Long-term changes in noise levels due to increased vehicular traffic and other activities in areas where development contributes to increased levels of human activity

As discussed in Chapter 2, the degree of development associated with the covered activities would be similar under all alternatives. Over the next 30 years, development of residential-zoned properties is expected to increase from its current level (58 percent of capacity) to approximately 70 percent of capacity, within current zoning allowances. Likewise, during the same period, implementation of the other activities described in Chapter 2 would be similar under the No Action Alternative and the action alternatives.

Over the long term, noise levels in the study area are expected to increase with continued urbanization and associated development. The greatest increases in County jurisdiction would occur in UGAs (due to zoning density), near commercial or industrial development, and near major roadways.

Site-specific locations of impacts to noise would slightly vary among alternatives. Under the No Action Alternative, County-permitted development and County infrastructure activities would generally not proceed on lands occupied by ESA-listed species. By contrast, these actions would occur in occupied and unoccupied habitats under the action alternatives. Because all activities would comply with local noise ordinances, none of the alternatives would have any significant impacts on noise.

Because the extent of County buildout is similar among alternatives, the bigger differences between the alternatives related to noise arise primarily from the establishment and management of mitigation sites under the action alternatives as compared to the No Action Alternative.

The following subsections compare the potential impacts of the alternatives.

3.5.2.1 No Action Alternative

Under the No Action Alternative, construction of development projects could result in temporary increases in noise levels near construction sites. These increases would be short-lived and confined to small areas near project sites, and construction work would be required to comply with applicable noise ordinances. Long-term changes in noise levels would be caused by increased vehicular traffic and other activities in areas where development contributes to increased levels of human activity, notably in areas

of greater zoning density, near commercial or industrial development, and near major roadways. It is expected that development projects would comply with the local noise ordinances and not exceed the maximum allowable noise levels at locations of sensitive receivers.

As such, construction-related noise and long-term traffic noise associated with the No Action Alternative would not be expected to adversely affect sensitive noise receptors in nearby areas, and thus would not result in significant impacts on noise in the study area.

3.5.2.2 Proposed Action

Similar to the No Action Alternative, the Proposed Action could result in short-term and localized increases in noise levels near construction sites. In addition, and in contrast to the No Action Alternative, implementation of habitat restoration, enhancement, and management activities (e.g., mowing) at mitigation sites would generate short-term and localized increases in noise levels. Implementation of BMPs for covered activities could result in small reductions in the extent of construction-related noise because construction zones around project sites would be confined to the minimum practical area of disturbance. As discussed in the No Action Alternative, long-term changes in noise levels caused by increased vehicular traffic are expected to comply with the local noise ordinances and not exceed the maximum allowable noise levels at locations of sensitive receivers.

As such, construction-related noise and long-term traffic noise associated with the Proposed Action would not be expected to adversely affect sensitive noise receptors in nearby areas, and thus would not result in significant impacts on noise in the study area.

3.5.2.3 Modified HCP Alternative

In contrast to the Proposed Action, mitigation under the Modified HCP Alternative would occur only in new reserves, meaning habitat enhancement at existing reserves and establishment of working-land easements would not be available as mitigation opportunities under this alternative. As a result, habitat restoration, enhancement, and management activities would be even more concentrated under this alternative than under the Proposed Action, and all mitigation actions would occur on sites zoned for greater impacts. Therefore, slightly fewer people would be exposed to construction noise generated during mitigation work compared to the Proposed Action. As discussed in the No Action Alternative, long-term changes in noise levels caused by increased vehicular traffic are expected to comply with the local noise ordinances and not exceed the maximum allowable noise levels at locations of sensitive receivers.

As such, construction-related noise and long-term traffic noise associated with the Modified HCP Alternative would not be expected to adversely affect sensitive noise receptors in nearby areas, and thus would not result in significant impacts on noise in the study area.

3.5.2.4 Avoidance, Minimization, and Mitigation Measures

In accordance with 40 CFR § 1502.16 and WAC 197-11-440(6)(c)(iii), this analysis considers other appropriate mitigation measures not already included in the proposed action or alternatives to address impacts related to noise. Under existing regulations, summarized in Section 3.5.1, mitigation measures related to noise are generally managed through zoning and site design requirements that are common to all alternatives. As described above, the action alternatives include measures intended to avoid, minimize, and mitigate impacts to covered species, which create some foreseeable minor impacts on noise, described above. These measures are not expected to result in significant adverse effects on noise.

No additional avoidance or mitigation measures are included in the action alternatives. Nothing in this EIS is intended to limit the mitigation authorities of other agencies, should additional mitigation responsibilities be identified while planning, permitting, or carrying out individual activities.

3.6 Land Use

This section describes the reasonably foreseeable environmental trends related to existing land use and foreseeable patterns of land use changes in the study area. The study area for land use is synonymous with the HCP permit area, which includes the area for which Thurston County has jurisdiction (approximately 412,228 acres). The study area excludes the seven incorporated cities, federal lands (such as wildlife refuges, national forests, and JBLM), and tribal lands within Thurston County. The UGAs of incorporated cities, however, are within the jurisdiction of Thurston County and are included in the study area. No planned actions specific to this environmental discipline have been identified.

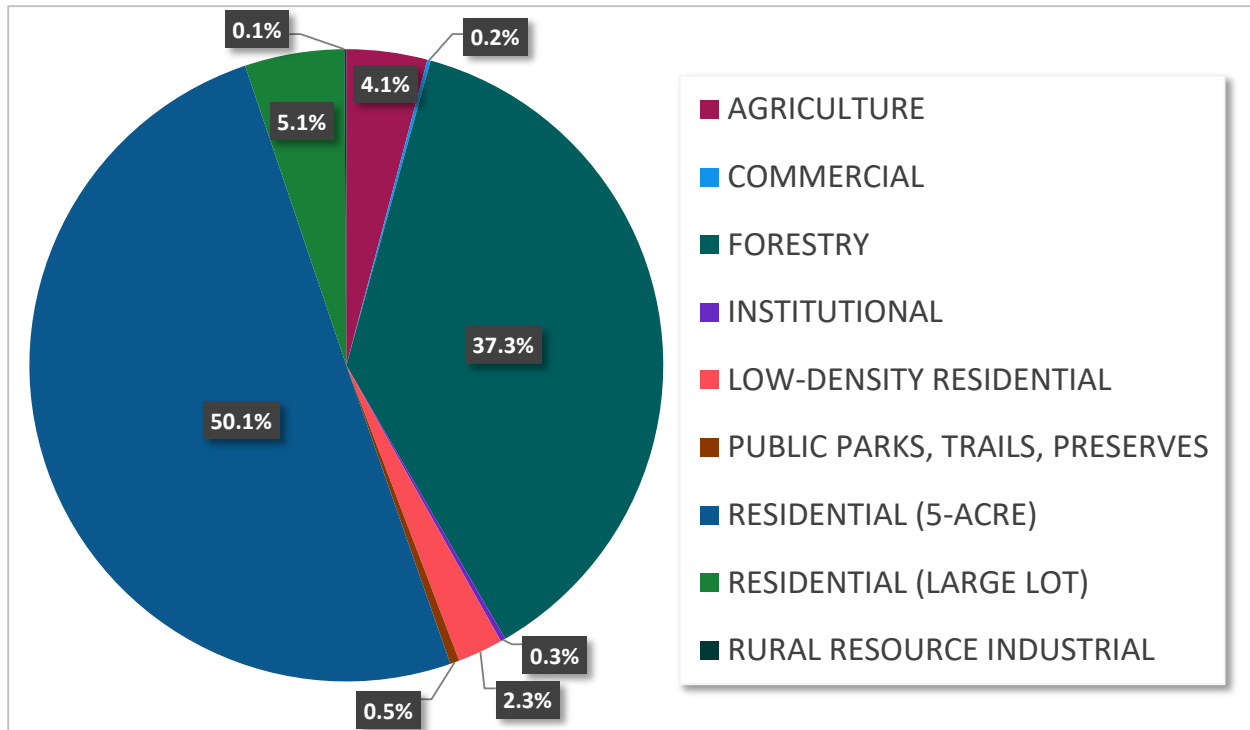
The following analysis includes consideration of the affected environment, evaluates potential impacts to the land uses that may occur in the study area (including land use trends) as a result of the alternatives, and identifies potential measures to avoid or reduce those impacts if necessary. The regulatory context for the land use analysis primarily relies on best available information in the TCCP and its related documents. The TCCP, developed under the framework of County's adopted Countywide Planning Policies and updated in 2020, provides long-term land use goals and policies and establishes land use patterns over a 20-year planning period as required under the GMA (RCW 36.70A). The TCCP goals and policies support the County's vision for all aspects of the natural and built environments, including land use; natural resource lands; housing; transportation; capital facilities; utilities; economic development; environment, recreation, and open space; archaeological and historic resources; and health.

The environment, recreation, and open space chapter of the TCCP includes measures for protection of critical areas, habitats and species, and water resources that are consistent with Countywide Planning Policies and GMA. Activities conducted, permitted, or authorized by the County undergo review to support compliance with these requirements. Per RCW 36.70A, critical areas protections outlined in the TCCP apply to critical aquifer recharge areas, geologic hazards, frequently flooded areas, fish and wildlife habitat conservation areas, and wetlands, and they are implemented through the CAO (TCC Chapter 24). Critical areas protection and mitigation associated with agricultural activities are addressed in TCC Chapter 17.15. The Thurston County zoning code (TCC Chapter 20) guides development based on the goals, policies, and general vision of the TCCP. The Thurston County Shoreline Management Master Program implements the Washington State Shoreline Management Act at the local level to implement goals and policies that guide development and use of and prevent inherent harm to shorelines of the state (Thurston County 2017). In addition, the regulatory framework described in Section 1.4 of the HCP is incorporated here by reference. Adoption and implementation of the Thurston County HCP would not alter existing plans and regulations.

3.6.1 Affected Environment

3.6.1.1 Land Use

Land uses within the study area largely fall within unincorporated Thurston County and are primarily commercial, residential, institutional, and park lands. As shown in Figure 3.6-1, 5-acre residential and forestry uses dominate the unincorporated county.

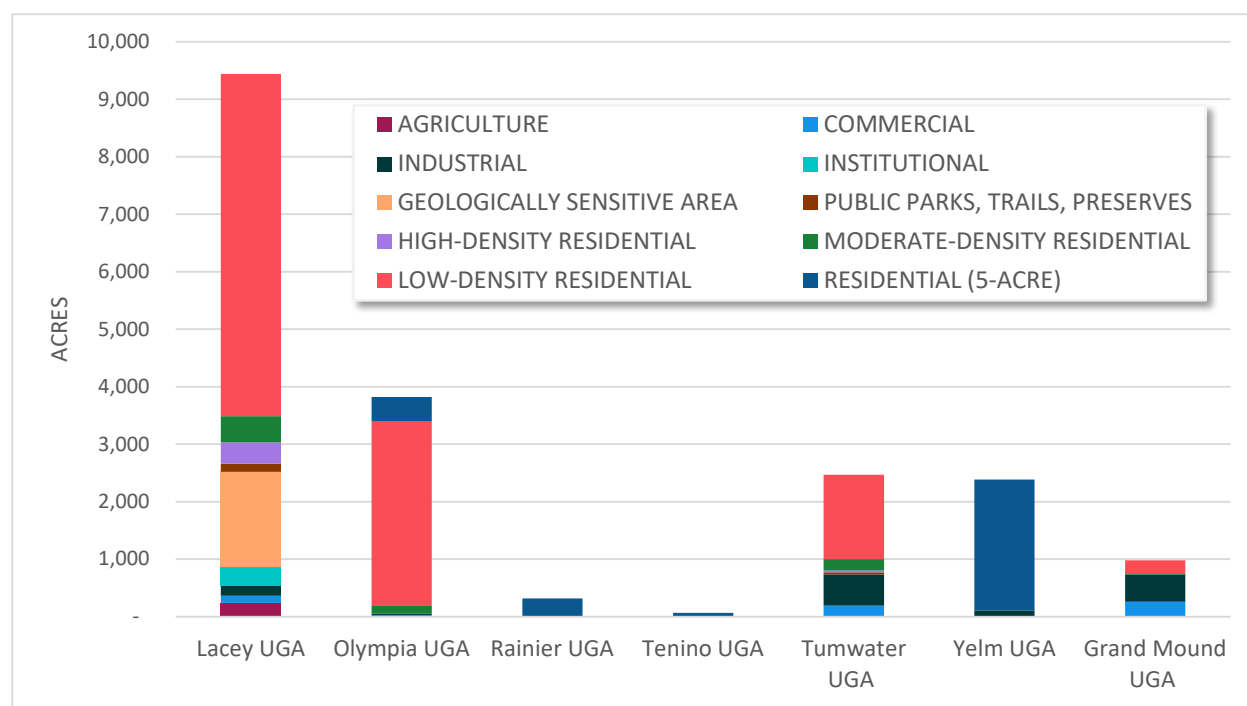


Source: Thurston GeoData Center 2020.

Figure 3.6-1. Land Uses in Unincorporated Thurston County, Excluding Urban Growth Areas

Land uses in the several UGAs that are appurtenant to Thurston County's larger cities, such as Olympia and Lacey, are more urban in nature, with larger proportions of commercial and industrial uses as well as higher-density residential uses, compared to other portions of unincorporated Thurston County (Figure 3.6-2). UGAs for smaller cities, such as Rainier and Yelm, are more rural, with larger lot residential uses.

Primary land use objectives of the TCCP support goals of maintaining the rural nature of Thurston County guide rural land use and associated activities as well as housing and residential densities in rural areas. Maintenance of the rural direction set forth in the Comprehensive Plan is through County programs and regulations, requiring that decisions about land use conform to this direction while directing growth to appropriate areas, including the UGAs. The TCCP undergoes a thorough review and update every 8 years, according to the schedule provided in RCW 36.70A. In the review and update process, the goals, objectives, policies, actions, and standards are amended to articulate both changes that the County has experienced since adoption of its current Comprehensive Plan and plans for the County's future.



Source: Thurston GeoData Center 2020.

Figure 3.6-2. Land Uses in Thurston County Urban Growth Areas

According to the most recent land use projections from the Thurston GeoData Center (2020), approximately 45 percent of lands in unincorporated Thurston County could be developed in the future. Of this 45 percent, approximately 6 percent is vacant lands, 23 percent is parcels projected to be infilled, and 15 percent is in agricultural or forestry use (5 percent and 10 percent, respectively) but not zoned for long-term commercial forestry or agriculture.

While agricultural lands of long-term commercial significance represent a comparatively small proportion of Thurston County, agricultural uses also occur over much of the large lot and 5-acre residential lands, which account for 55 percent of the land area in unincorporated Thurston County (Thurston GeoData Center 2020). Farmland in these zones is dispersed among residential properties that allow for residential uses; as population increases and residential development proceeds, a trend toward non-farm uses will likely accompany development. The Lacey UGA, which includes the largest land area of the county UGAs, incorporates approximately 220 acres of primary agricultural use. With the emphasis on directing development into UGAs, these agricultural use acres may be converted to support residential and commercial development. As described in Section 2.1.1.4, buildout of residentially zoned properties in the County's jurisdiction is expected to increase to approximately 70 percent (from the current level of 58 percent) over the next 30 years. Aside from individual County-permitted development activities and periodic updates to the TCCP, consistent with reasonably foreseeable environmental trends, no other planned actions specific to this environment discipline have been identified.

3.6.1.2 Population and Growth Projections

Over the past 40 years, the rate of population growth in Thurston County has been among the highest in the nation (TRPC 2019b). The 2020 TCCP notes that most population growth has been the result of in-migration and that the majority of new residents settle in cities and UGAs. The TRPC updates population forecasts every 3 to 5 years and completed its most recent estimates in June 2020; these forecasts are included in Table 3.6-1. Population forecasts in Table 3.6-1 reflect available population

data that have been extrapolated by TRPC over a period of time that provides a reasonable degree of accuracy. Existing data and resulting projections cannot provide population forecasts, changes, and allocations in the full 30-year analysis term for this EIS; as shown, forecasts are for a 25-year period extending from 2020 to 2045. The trends projected through this period are expected to continue relatively similarly through the 30-year analysis period of this EIS. No NEPA planned actions would affect the described population projections.

Table 3.6-1. Population Allocation and Forecast by Thurston County Jurisdiction, 2020–2045

	2020 Population	2045 Forecast	Change 2020-2045	Percent Change 2020-2045
Lacey UGA ¹	37,190	55,590	18,400	49%
Olympia UGA	12,640	15,600	2,960	23%
Rainier UGA	115	160	45	39%
Tenino UGA	15	45	30	200%
Tumwater UGA	3,300	9,180	5,880	178%
Yelm UGA	1,405	1,670	265	19%
Grand Mound UGA	1,395	2,745	1,350	97%
Rural County ²	88,370	98,110	9,740	11%
Total Unincorporated Thurston County with UGAs	144,430	183,100	38,670	27%

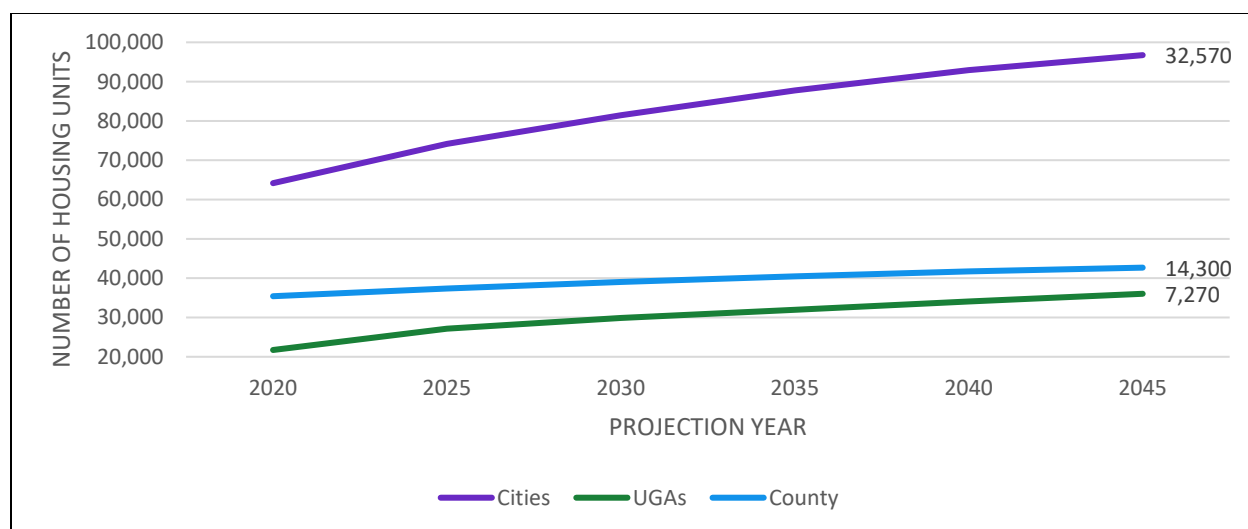
Source: TRPC 2020a.

1) Urban Growth Area (UGA): Unincorporated area designated to be annexed into city limits over 20 years' time to accommodate urban growth.

2) Rural County is the portion of the unincorporated county that lies outside UGA boundaries.

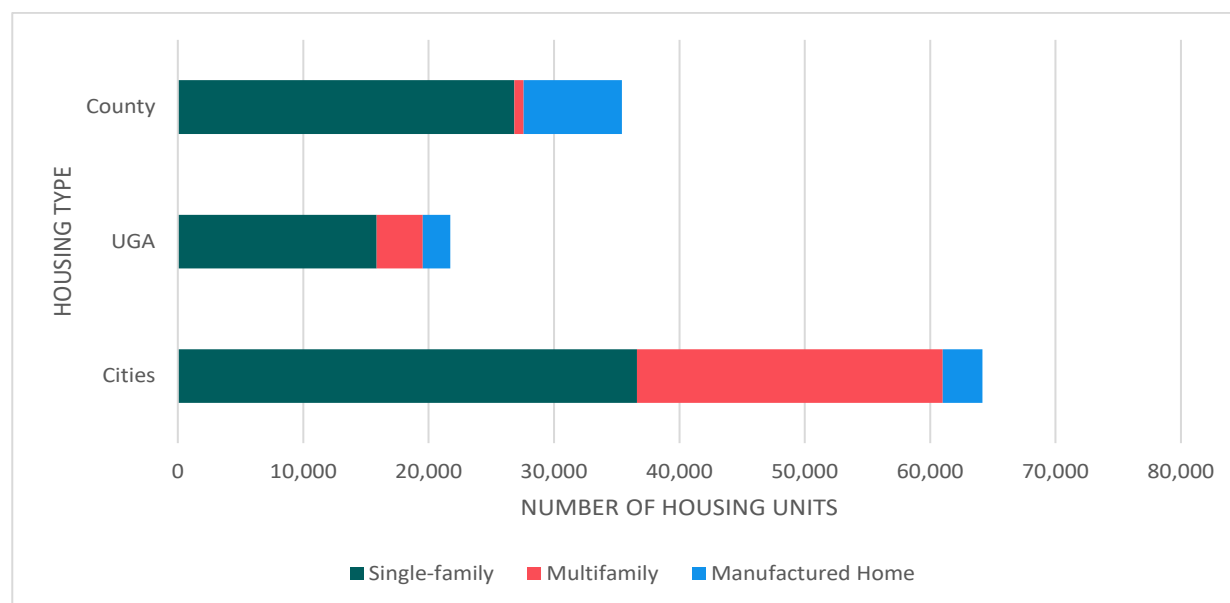
In 2020, the total population of unincorporated Thurston County was 144,430. Projections show more than 180,000 people living in the unincorporated county by 2045, with the highest population increases, ranging from 19 percent to 200 percent, projected to occur in the higher-density UGAs. An estimated 11 percent of the population growth is projected to occur in the rural unincorporated county. By 2045, some of the UGAs may have been annexed by their respective cities and would no longer be within Thurston County's jurisdiction. The population projections rely on past development trends to allocate growth. The TRPC (2019b) notes that, while the rural areas generally have ample capacity for new growth, growth rates have been slow, and this trend is expected to continue in the future. New development in the County's jurisdiction is expected to occur primarily in UGAs rather than the portions of the unincorporated county that lie outside UGA boundaries (Figure 3.6-3). Development in these areas is driven by proximity to jobs and schools and demographic factors related to the mix of housing styles and amenities, as well as to walkable communities.

In 2020, the primary housing type in unincorporated portions of the county and in incorporated cities was single-family (Figure 3.6-4). The 2020 Draft Buildable Lands Report (TRPC 2020a) notes that gross density (which measures the number of homes over a given area) in UGAs and the unincorporated county is higher near urban areas because of TCCP planning for higher densities in these areas and the emphasis on preservation of the County's rural character in those areas. Some rural lands that are zoned for large-lot, single-family residential uses, such as one dwelling per 5 acres, have recently been developed and removed from agricultural use (TRPC 2020a). This trend is expected to continue. Most agricultural lands zoned for long-term agricultural use would be maintained over time because of resource land protections provided in the TCCP and GMA.



Data source: TRPC 2020a.

Figure 3.6-3. Housing Units and Actual Housing Unit Increase for Unincorporated Thurston County, Its Cities, and Urban Growth Areas



Data source: TRPC 2020c

Figure 3.6-4. 2020 Housing Unit Types for Unincorporated Thurston County, Its Cities, and Urban Growth Areas

TRPC (2020a) states that there is sufficient land supply in UGAs to accommodate the projected population growth, though as mentioned above, approximately 11 percent of the population in unincorporated Thurston County is likely to occur outside UGAs. Rural development trends show a decline in the proportion of new housing, in large part because trends locally and nationwide lean toward urban, rather than rural, development. In addition, requirements for protecting ESA-listed species and CAO-designated sensitive areas impact the certainty for development planning in rural areas. Finally, water availability and zoning have also affected the availability of buildable lands in rural areas (TRPC 2019c). The population trends seen today, primarily slow growth in the unincorporated County and slightly faster growth in the higher density UGAs, coupled with the housing dominance of single family residential, are expected to continue.

3.6.2 Environmental Consequences

This section describes the land use development trends, development processes, and conservation lands as they relate to the HCP action alternatives considered and the No Action Alternative. Other environmental outcomes related to land use changes, such as air quality, water quality, noise levels, and traffic congestion, are discussed in other sections of this EIS. For this analysis, land use trends described in Section 3.6.1 are expected to continue. The primary differences between alternatives would concern uses of lands identified as having habitat for covered species. Development and conservation actions would occur on these lands under the action alternatives, whereas the No Action Alternative would prioritize activities on lands not occupied by ESA-listed species. This analysis considers the reasonably foreseeable environmental trends and planned actions (collectively described above as the affected environment) together with each alternative in order to assess the environmental effects of the alternatives on land use.

The County and USFWS have determined that an alternative would have significant impacts on land use if implementation would result in the following:

- Any land use changes that conflict with a local land use plan, policy, or regulation (land use plan compatibility)
- A substantial change in the rate of agricultural land conversion

Under any of the alternatives, the County would continue to be able to charge impact fees for changes in land use to offset the public costs associated with infrastructure and services related to new land uses. Impact fees represent an existing local authority to mitigate impacts of land use changes on public infrastructure or public services. These fees would not vary as a result of the alternatives and, as such, the fees themselves are not addressed in the analyses of the effects of the alternatives. In addition, periodic updates to the TCCP would occur under any of the alternatives, with resulting changes in land use densities in some areas. Under any alternative, however, the anticipated buildout of residentially zoned properties over the next 30 years is not expected to exceed 70 percent of current zoning capacity, so these planned actions (as defined in NEPA) would not alter the effects of the alternatives on land use.

3.6.2.1 No Action Alternative

Land Use Plans and Policies

Under the No Action Alternative, USFWS would not issue an ITP to Thurston County and the County would not adopt or implement the Thurston County HCP. Federal, state, and local land use policies and permitting requirements would continue under the regulatory framework in place today; the No Action Alternative would be consistent with existing land use plans and policies.

County-permitted development activities and County infrastructure activities would continue as projected by the County (with appropriate permits and approvals), but at a slower pace because of individual project requirements to review projects in the modeled habitat of listed species occupancy to support appropriate take avoidance. TRPC forecasted buildout in unincorporated Thurston County with the assumption that critical areas will be preserved through development restrictions to meet TCCP habitat goals as implemented through the CAO. Assumptions for county population and associated housing development for the County's buildable lands program incorporate CAO protections. Critical areas and special habitats described in Section 3.4.2 were deducted from the buildable lands supply (TRPC 2019a), regardless of the County's adoption of the HCP.

The No Action Alternative would require project proponents, including the County, to avoid unauthorized impacts to ESA-listed species. The ESA Section 4(d) special rule for the covered Mazama

pocket gopher subspecies allows for continued farming and ranching activities; routine maintenance at airports and road rights-of-way; and certain activities on non-commercial and single-family residential properties. Absent the countywide HCP, development—especially residential development—could expand into areas that are not occupied by covered species, regardless of whether those are forests, grasslands, prairies, or previously developed areas. Residential development may also expand into areas such as large-lot residentially zoned lands that are in agricultural use; agricultural lands of long-term commercial significance zoned under TCC 20.08A that would be expected to remain in agricultural use and include no more than one single-family farm residence per lot.

As described in Section 2.1.1.4, we assume 70 percent buildout of residential-zoned parcels in the County's jurisdiction (within current zoning allowances) over the next 30 years. Compared to the Proposed Action (under which 11 percent of developable land in high-quality habitat areas would be conserved), these lands would be available for development where individual projects could avoid prohibited take. As a result, the No Action Alternative could result in a patchwork of development amidst priority conservation areas for *Mazama* pocket gopher subspecies habitat areas.

Development proposed within all modeled habitat for ESA-listed species would be evaluated by the County and take avoidance would be required. As discussed in Section 2.1.2.6, the pace of individual development projects under the No Action Alternative may be slowed by the rigorous nature of the individual permitting and take-avoidance process. This would maintain pressures on landowners to demonstrate that their lands are not occupied by ESA-listed species, or to avoid area that may provide habitat for prairie species or Oregon spotted frog habitats by focusing on redevelopment or developing forestlands. Avoidance of such areas under the No Action Alternative may result in an increased emphasis on developing forestlands or redeveloping previously developed areas. Project proponents who could not avoid prohibited take of ESA-listed species may choose to apply for an ITP from USFWS for a site-specific project, which would trigger its own environmental compliance requirements. Any such future individual ITPs are not included in this analysis.

We expect this alternative to have no effect on population trends at the county scale. We expect the County to meet long-term growth demands. Individual landowners seeking land use changes may not develop to their zoning potential where ESA-listed species occur. This is a negative effect of the No Action Alternative on land use that may be significant at highly localized scales.

In the absence of a countywide HCP, no change to the County's land use plans or policies would occur, there would be no change to buildable lands projections to accommodate future county population growth and associated development, and population growth trends would not be altered. The No Action Alternative would, however, affect the zoning potential for lands associated with ESA-listed species occurrence because some landowners may not develop their occupied lands. For individual development projects, the CAO would provide avoidance and mitigation for protected critical areas according to the ordinance; potential impacts to covered species on occupied lands would require individual analysis under ESA. The No Action Alternative would not result in conflicts with existing plans, policies, and regulations, but there would be no regulatory assurance for lands occupied by ESA-listed species and species avoidance would be required and the resulting effect on land use would be significant in some areas.

Agricultural Land Conversion

The County's existing regulatory framework would apply under the No Action Alternative. As such, agricultural and other resource lands, especially agricultural lands of long-term commercial significance zoned under TCC 20.08A, would be protected under the TCCP. Farm-related land use on large-lot residential land, such as land zoned for one residence per 5 acres, would follow the trend of incremental conversion to non-farm uses with increased population pressure and the need for development of lands

not occupied by ESA-listed species. ESA Section 4(d) allows for continued farming and ranching activities on lands occupied by the *Mazama* pocket gopher subspecies, as well as for some residential land maintenance activities on already-developed lands.

The trend toward non-farm use of lands currently used for agriculture but not zoned for long-term agriculture would continue into the future; the County projects that 4.9 percent of such lands would be developed over the next 20 years or so (see Section 3.6.1.1). This trend would be significant for the No Action Alternative, compared to the Proposed Action, because the Proposed Action includes working-land easements that would provide incentives to some agricultural landowners to permanently maintain lands in agricultural use or open space. In addition, the connectivity between open spaces that could be realized with conservation easements on working lands would not occur under the No Action Alternative.

3.6.2.2 Proposed Action

Land Use Plans and Policies

The primary differences between the Proposed Action and the No-Action Alternative related to land use are improved planning certainty for land use changes and the establishment of a network of conservation lands. Similar amounts of development would occur under either alternative, though the locations of development under the Proposed Action would include sites occupied by covered species. Likewise, procedures under the Proposed Action would streamline development planning throughout modeled habitat for covered species.

The Proposed Action is supported by the TCCP and its support documents. As noted in Section 3.6.1, the County population, including UGAs, is projected by TRPC to increase 27 percent by 2045; associated housing demand to accommodate this population is projected to be 79,370 new housing units (42,680 in rural unincorporated Thurston County and 36,690 in UGAs) (TRPC 2020c). Approximately 45 percent of the land area in unincorporated Thurston County may be developed or redeveloped to accommodate the project housing demand (Thurston GeoData Center 2020).

The streamlined permitting process provided under Proposed Action would not necessitate screening for species occupancy in proposed development areas and would provide regulatory certainty for both the County and private landowners in project permitting. Under the Proposed Action, the County would permit development of otherwise legal projects and would conduct infrastructure activities as needed to ensure public safety and effective utility of public infrastructure. Applicants would obtain a certificate of inclusion under the County's ITP after working with the County to apply avoidance and minimization BMPs to their site-specific development proposal and subsequently paying a mitigation fee, dedicating land, or purchasing credits from an independent mitigation bank, and then continue with their covered activity. The collected mitigation fees would fund, along with County funds, the protection and permanent management of occupied habitat that would fully offset the impacts of the taking on covered species resulting from the covered activity (see Section 2.1.3). In comparison, projects proposed under the No Action Alternative would require individual site reviews to support take avoidance, as described in Section 2.1.2.6. As such, the Proposed Action would accelerate and improve planning certainty for development projects in modeled habitat for HCP-covered species.

In developing the Proposed Action, the County worked with TRPC and others to ensure that the County's forecasted population growth, development, and land use needs would be met within the proposed ITP permit term. The Proposed Action would incrementally establish up to approximately 2,698 acres of new habitat reserves, up to approximately 433 acres of working-land easements, and up to approximately 339 acres of enhancement of existing habitat reserves. The TRPC buildable lands analysis, in accounting for lands that would be used for establishing conservation easements and acquiring other conservation lands under the HCP, would not change the overall housing development patterns or

associated population trends expected to occur in the permit area over the permit term. Under the Proposed Action, population growth in unincorporated Thurston County would be accommodated on available lands outside of lands reserved in the HCP conservation program (TRPC 2020c) and, as such, impacts to land use patterns and population trends would be less than significant. In addition, the Proposed Action would support existing land use plans and policies. As a result, this alternative would have no significant effect on land use plans and policies, which is a more positive outcome on this resource than the No Action Alternative.

New habitat reserves established to offset the impacts of the taking of covered species by covered activities would be managed primarily to address the habitat needs of the covered species. Conservation would occur on a network of sites for most covered species; all conservation for Oregon spotted frog would be provided on one new habitat reserve. Creation of habitat reserves within prairie habitat in established agricultural areas could result in land use compatibility conflicts because of crop production management practices associated with agricultural lands. Likewise, creation of habitat reserves in areas with generally high levels of human activity could create conflicts with the HCP land use goals for species preservation. To avoid these types of conflicts, the Proposed Action includes options for achieving some mitigation on existing reserves or on working agricultural lands. To further avoid such conflicts, the County would only seek conservation lands with willing landowners, and the program would accommodate compatible land uses, such as compatible recreation. Therefore, it is expected that the conservation lands can complement a range of neighboring land uses. The general selection criteria for conservation lands (HCP Section 5.4.1) identify high-priority sites as those lands surrounded by compatible land uses that minimize factors such as pesticide drift, predation risk, invasive species, or disturbance. The project-specific BMPs that would be implemented in association with project development, coupled with careful selection of conservation lands, would be an effective means to support the County's land use plans, individual land-use changes consistent with zoning, and the County's goal to maintain working lands and open spaces. As a result, land use conflicts identified under the No Action Alternative would be alleviated or resolved under the Proposed Action.

Under the Proposed Action, property owners would have access to a streamlined and predictable permitting and development process, and the County would be assured a predictable planning framework related to lands occupied by covered species for a 30-year period. As noted in the introduction to Section 3.6, County plans and policies that guided HCP development include the TCCP and its supporting documents. The HCP is based on Goal 5 of TCCP Chapter 9, Environment, Recreation, and Open Space, which calls for plant and animal habitat protection, conservation, and enhancement through policies that support strategy development for important habitat protection and restoration. The policies supporting the goal include identification and protection of land providing essential connections between riparian habitat areas, open spaces, and significant wildlife habitats sustaining state priority, ESA-listed, or locally important wildlife species through easements, fee acquisition, or regulations (Thurston County 2020e). The Proposed Action is fully consistent with these goals and policies in providing a system in which project mitigation fees would fund conservation lands that would result in important habitat protection and restoration and meet the TCCP goals. The No Action Alternative, in comparison, would not result in habitat protection, conservation, and enhancement, other than what would be provided through take avoidance under the CAO on non-occupied lands, consistent with existing trends in the affected environment. In contrast to the No Action Alternative, the Proposed Action would accommodate development in habitat occupied by ESA-listed species, better supporting TCCP goals associated with local control and streamlining local procedures.

Agricultural Land Conversion

The existing land use trend of conversion of lands currently used for agriculture but zoned as large-lot residential lands (i.e., one housing unit per 5 acres), to residential use would continue under the Proposed

Action. As described in Section 3.6.1.1, approximately 4.9 percent of these types of lands that are currently in agricultural use are projected to be developed between 2020 and 2045 (TRPC 2020a). This trend would continue under the Proposed Action. In addition, the Proposed Action would permanently protect up to 3,469 acres of conservation lands in the program. Among these lands, approximately 433 acres would be conservation easements on working agricultural lands. In this manner, the Proposed Action includes support for the permanent maintenance of agricultural lands beyond the level of the No Action Alternative. Conservation easements on working lands would occur in the ranges of the Tenino pocket gopher, Yelm pocket gopher, and Oregon vesper. County zoning and the conservation lands network would maintain a network of open spaces that public and agricultural lands currently provide.

Under the Proposed Action, permanent conservation easements on agricultural lands would be purchased from willing sellers and would identify conservation values to be maintained and extinguish development rights to protect specified habitats and species while meeting both the objectives agricultural landowner and the biological goals of the HCP. Conservation easements on privately owned agricultural lands would support continued economically viable uses of rangelands and certain agricultural lands and practices that would be compatible with covered species conservation. These conservation easements on agricultural lands would provide financial incentives to maintain farm uses and would slow the pace of agricultural land use loss. A model conservation easement is included as Appendix L to the HCP.

On protected agricultural lands, habitat targets would be structured to complement agricultural objectives, permanently maintaining agricultural uses compatible with habitat for covered species. As a result, conversion of enrolled agricultural lands to other uses would be avoided. As described above, the trend of converting some large-lot residential lands currently in agricultural use to non-farm residential, commercial, or other uses would continue under the Proposed Action. The Proposed Action differs from the No Action Alternative by including measures to minimize impacts to covered species (which would incentivize maintenance of open space on large-lot residential developments), and through mitigation (which would permanently maintain approximately 433 acres in farm use). The No Action Alternative, in comparison, does not include protections for covered species on agricultural working lands. As a result, effects of the Proposed Action on agricultural land use conversion would not be significant.

3.6.2.3 Modified HCP Alternative

Under the Modified HCP Alternative, as under the Proposed Action, USFWS would issue an ITP to Thurston County. The permit area, permit term, covered species, covered activities, and nearly all other elements of the HCP would be identical to those described for the Proposed Action. The primary difference between the Modified HCP Alternative and the Proposed Action is that mitigation for unavoidable impacts to covered species would be provided only on new reserves purchased from willing sellers. Conservation easements on working lands and enhancement of existing reserves would not be part of the mitigation strategy. Similar to the No Action Alternative, the Modified HCP Alternative would support ongoing farm management but would not provide new tools for permanent maintenance of working agricultural lands. As such, under the Modified HCP some agricultural lands would be converted to residential, commercial, or other land uses, and some may be acquired by the County for conservation lands. These lands would then be managed for high-quality habitat for covered species instead of farm production.

To fully offset the impacts of the taking on covered species to the same extent as the Proposed Action, the Modified HCP Alternative would establish and manage new reserves to provide high-quality habitat. The total number of mitigation acres necessary for the Modified HCP Alternative would be fewer than for the Proposed Action because reserve areas would be managed for the highest-quality habitat practical for the species. Less area of high-quality habitat would be needed to offset the same amount of

impacts based on the HCP's functional-acre metrics. Otherwise, the criteria for conservation lands would be the same as for the Proposed Action.

The potential for land use conflict is evaluated using the same underlying assumptions and framework established for the Proposed Action, particularly the County land use plans and policies. Consistency with these plans and programs would result in a non-significant effect on land use. Additionally, effects on agricultural land use conversion are meaningful to the local community.

As discussed in Section 2.1.1.4, buildout of residentially zoned properties in the County's jurisdiction is expected to increase to approximately 70 percent (from the current level of 58 percent) over the next 30 years. Associated development patterns under this alternative would be equivalent to those described for the Proposed Action. Issuance of an ITP under this alternative would provide the same planning certainty and local permit streamlining as under the Proposed Action. As a result, the Modified HCP Alternative would not have a significant effect on land use and would avoid conflict with land use plans and policies, equivalent to the Proposed Action.

Because the mitigation program for the Modified HCP would not include conservation easements on working agricultural lands, this alternative would not reduce the trend of agricultural land conversions like the Proposed Action would. Most such conversions would be to residential or commercial land uses. Some farms may be kept in open space as conservation lands. However, the streamlined development planning provided for by incidental take coverage could result in slightly more loss of agricultural lands over the permit term, compared to the other alternatives. As a result, the Modified HCP may have a significant negative effect by increasing the trend of agricultural land conversion, compared to both the No Action Alternative and the Proposed Action.

3.6.2.4 Avoidance, Minimization, and Mitigation Measures

As a condition of ITP issuance, ESA Section 10(a)(2)(B)(ii) requires ITP applicants to minimize and mitigate the impact of the taking on covered species to the maximum extent practicable. Mitigation that fully offsets the impacts of the taking to covered activities would meet the Section 10(a)(2)(B)(ii) ITP issuance criterion. ESA authorities do not enable USFWS to require mitigation beyond that which fully offsets the impacts of the taking. The mitigation for impacts to covered species proposed under each action alternative is designed to fully offset impacts of the taking on covered species and would also provide benefits by resolving land use conflicts occurring in the No Action Alternative, as discussed above.

In accordance with 40 CFR § 1502.16 and WAC 197-11-440(6)(c)(iii), this analysis considers other appropriate mitigation measures to address impacts to land use. Under existing regulations, summarized in Section 3.6.1, measures related to land use are managed locally through the County's implementation of the GMA, the TCCP, SEPA, the Thurston County zoning code, and related codes and regulations, which are common to all alternatives.

Under any of the alternatives, Thurston County codes and regulations pertaining to zoning, critical areas, and related would continue to condition development. Additionally, Thurston County can charge impact fees for changes in land use to offset the public costs associated with infrastructure and services related to the new land uses. The ability to assess these fees would not vary among alternatives (see Section 3.12). As described above, the No Action Alternative would maintain significant conflicts related to land use changes where ESA-listed species overlap with otherwise legal development proposals. The Proposed Action represents the County's proposed approach to resolve such conflicts because it would support improved conservation and improved regulatory certainty for planning land use changes in Thurston County jurisdiction.

Under the action alternatives, measures to avoid and minimize impacts to covered species would be codified as BMPs (Thurston County 2020f, Appendix C). The BMPs that would affect land use are focused

on minimizing the extent of ground disturbance from construction where compatible with land use goals. These measures would maintain open space on newly developed residential lands on larger lots, and on other developments where practicable. Likewise, the HCP conservation program would permanently maintain large open spaces that may mitigate increasing land use density (see Sections 3.7 and 3.9). The HCP BMPs would enhance County ordinances governing new development and may be in addition to, or may supersede, existing land use conditions under CAO.

Under the action alternatives, take authorization for covered species would support land use flexibility, consistent with County zoning. The certainty provided under the HCP that project proponents could build otherwise legal developments would fully resolve the land use conflicts related to covered species in the County jurisdiction, so this is the appropriate mitigation for the land use conflicts arising out of take avoidance under the No Action Alternative.

Nothing in this EIS is intended to limit the mitigation authorities of other agencies, should additional mitigation responsibilities be identified while planning, permitting, or carrying out individual activities.

3.7 Recreation

The study area for recreation includes all of Thurston County. Differences in the effects of the alternatives on recreation would be associated with differences in the amount of conservation lands that are accessible to the public. The alternatives would also differ with regard to the County's ability to implement maintenance projects in parks and other recreational areas. Because the availability of recreational opportunities on one set of lands influences the demand for recreational opportunities countywide, this analysis considers impacts throughout the county, not just in areas where the County has jurisdiction.

Information in this section is based on Thurston County's Parks, Open Space, and Trails Plan (Thurston County 2020c), which serves as an update to the 2013 Parks, Recreation, Trails, and Natural Resources Preserve Plan and informs the parks and recreation chapter of Thurston County's Comprehensive Plan. Chapter 9 of the Comprehensive Plan (Environment, Recreation, and Open Space) was adopted by the County in December 2020 (Thurston County 2020e).

3.7.1 Affected Environment

This subsection describes reasonably foreseeable environmental trends pertinent to recreational uses in the study area. Aside from individual County-permitted development activities and periodic updates to the TCCP, consistent with reasonably foreseeable environmental trends, no other planned actions specific to this environmental discipline have been identified.

Thurston County owns and operates 24 parkland sites (2,578 acres), including regional parks, trails, special-use parks, school parks, historic sites, open space/undeveloped parks, and preserves/natural areas. Of the total parkland area in Thurston County, 12 sites (972 acres) are fully or partially developed (Thurston County 2020c). Most of the developed park areas are in the northwestern portion of the county, and most of the open spaces are located in the eastern and southern portions of the county. Table 3.7-1 describes the classifications, provides the current acreages, and lists examples for each type of parkland (Thurston County 2020e).

Thurston County also collaborates with jurisdictions within the county, including the incorporated cities of Lacey, Olympia, and Tumwater, to provide additional recreational opportunities at non-county parks. These include community parks, neighborhood parks, mini-parks, special-use parks, and greenspaces. There are also public recreation lands managed by the state and federal governments within Thurston County, including Capitol State Forest, Billy Frank Jr. Nisqually National Wildlife Refuge, and others. Figure 3.7-1 on page 3-80 shows the lands for public purposes in Thurston County.

Table 3.7-1. Thurston County Parklands: Facility Types, Descriptions, and Examples

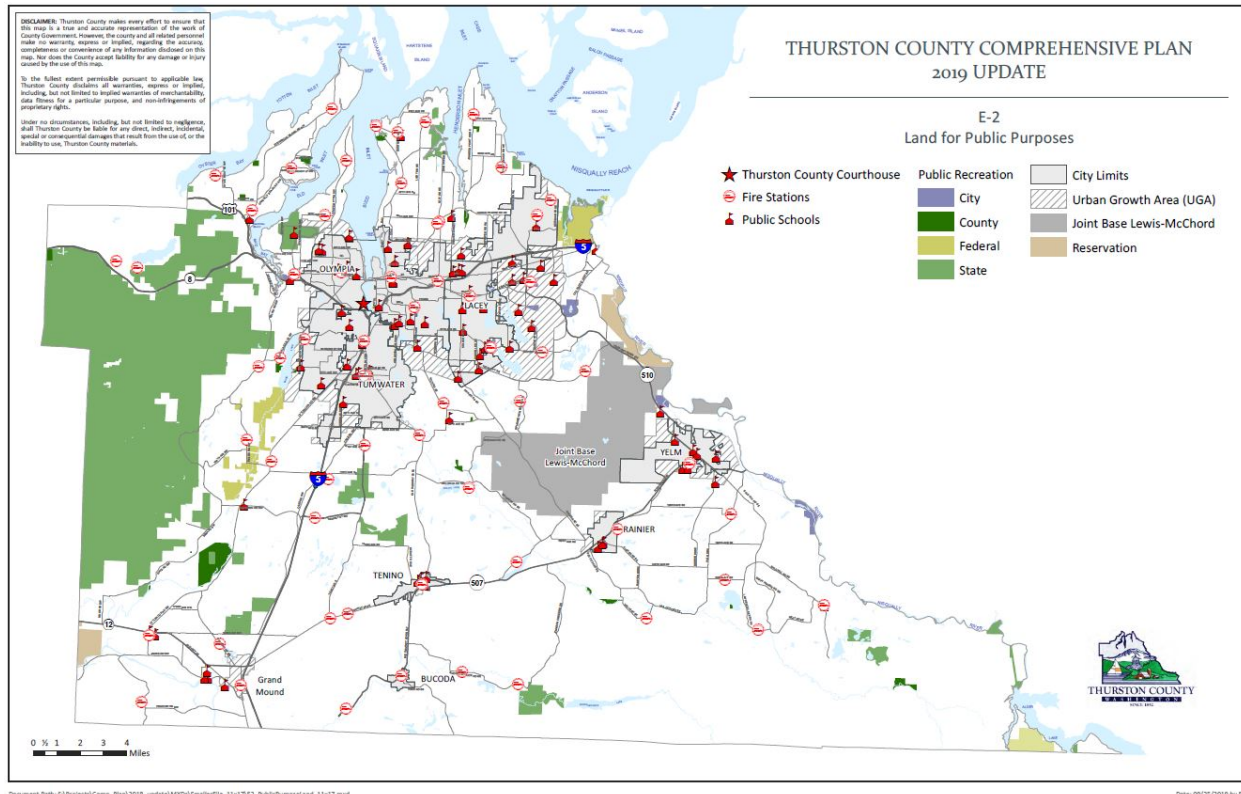
Classification Type	Current Area	Description	Example(s)
Regional Parks	381 acres	Larger destination parks that provide a combination of passive and active recreation opportunities and serve larger geographic and metropolitan areas	<ul style="list-style-type: none"> • Kenneydell Park • Deschutes Falls Park • Guerin Park
Trails	825 acres, including 56 miles of trail	Nonmotorized paths for a variety of users (e.g., pedestrians, bicyclists) intended to create a network to link parks/open space with neighborhoods, schools, and civic centers for recreational and transportation purposes	<ul style="list-style-type: none"> • Chehalis Western Trail • Yelm-Tenino Trail • Gate-Belmor Trail • Ralph Munro Trail
Special-Use Parks	5 acres	Specialized areas to meet the needs for a particular activity	<ul style="list-style-type: none"> • Off-Leash Dog Park (Hogum Bay Road)
Historic Sites	4 acres	Sites of historic and/or cultural significance	<ul style="list-style-type: none"> • Mima Prairie Pioneer Cemetery • Fort Eaton Monument • George Washington Bush Monument
Open Space/Undeveloped Parks	229 acres	Largely undeveloped areas that sometimes include facilities (e.g., trails, community gardens) and may or may not be formally recognized	<ul style="list-style-type: none"> • Deschutes River Park • Rainier View Park • Louise H. Meyers Park • Ruth Prairie Park
Preserves/Natural Areas	1,134 acres	Undeveloped areas focused on preserving wilderness and natural habitat for educational and research purposes with limited public access	<ul style="list-style-type: none"> • Glacial Heritage Preserve • Woodland Creek Wetlands

Source: Parks, Open Space, and Trails Plan (Thurston County 2020c)

The County's current level of service is approximately 3.51 developed acres of parklands per 1,000 residents. Based on 2040 population estimates, Thurston County predicts the need for an additional 210 acres of developed parklands to maintain the level of service (Thurston County 2020c).

As part of the Parks, Open Space, and Trails Plan's public involvement process, county residents were surveyed to determine the most-used recreation facilities and greatest needs for future facilities. The top three most-used facilities include paved walking/biking trails, unpaved nature trails, and open spaces/natural habitats. The top three greatest needs include nonmotorized trails, undeveloped natural areas/open spaces, and shoreline access. Survey respondents also indicated the need for additional parklands to serve the southern and eastern portions of the county, which generally have fewer facilities than the northwestern portion of the county (Thurston County 2020c).

Thurston County conducts management activities in parks, such as maintaining paved trails, constructing new trails, and improving park facilities. Trail maintenance activities, such as maintenance of ditches, stormwater conveyance systems, and bridges, may involve disturbance of soil and vegetation along trail corridors (Thurston County 2020f). Vegetation maintenance along trails includes mowing, herbicide application, tree removal, and tree plantings. Mowing typically affects a 3-foot area on each side of the trail and occurs once per month during the growing season (Thurston County 2020f).



Source: Thurston County Comprehensive Plan (Thurston County 2020e)

Figure 3.7-1. Land for Public Purposes in Thurston County

As described in Section 2.1.1.2, park and recreation maintenance in areas of habitat for *Mazama* pocket gophers, the most widespread of the ESA-listed species in the study area, is limited to activities that avoid take or are authorized under the 4(d) rule for *Mazama* pocket gophers. For example, mowing may impact individual *Mazama* pocket gophers, but in certain settings mowing is excluded from the take prohibitions for the species. Maintenance and improvement activities that may impact ESA-listed species and that are not authorized under the 4(d) rule for *Mazama* pocket gophers have been deferred over recent years where take authorization has not been obtained.

ESA-listed species are known to be present at several sites where the County expects to implement trail and park management activities in the next 30 years. Planned park improvement projects at sites with habitat for ESA-listed species include the following:

- Trail construction of the Gate to Belmore Trail section
- Public park improvements at Glacial Heritage Preserve
- Small improvement projects at other County parks (e.g., Kenneydell).

3.7.2 Environmental Consequences

The County and USFWS have determined that an alternative could have significant adverse impacts on recreation if implementation would reduce recreational opportunities for a substantial segment of the population. This analysis considers the reasonably foreseeable environmental trends and planned actions (collectively described above as the affected environment) together with each alternative in order to assess the environmental effects of the alternatives on recreation.

Development and the other activities described in Chapter 2 would continue to occur under all of the alternatives, and the alternatives do not differ in their requirements pertinent to recreational opportunities. As such, the County would continue to expand and improve the park network where practicable to maintain the level or service as populations grow, and all alternatives could have the following impacts on recreation:

- Development could convert open space to other uses that would preclude recreational uses. Activities that have the potential to render open space inaccessible for recreational uses include residential, commercial and industrial development, public service facilities construction, construction of roadways, and construction or expansion of solid waste facilities.
- Implementing park improvements may increase recreational opportunities to varying degrees that are more dependent on site-specific plans than the action alternatives.

Under any alternative, construction of accessory structures, septic repair/extension, removal of underground storage tanks, transportation maintenance projects, and water resource management projects are not expected to affect recreational opportunities.

As discussed in Chapter 2, the total acreage of development activities would be similar under all alternatives. Over the next 30 years, development of residential-zoned properties is expected to increase from its current level (approximately 58 percent of capacity) to approximately 70 percent of capacity, within current zoning allowances. Likewise, implementation of the other activities described in Chapter 2 would be similar under the No Action Alternative and the action alternatives during the same period. As a result, the alternatives are not expected to differ in the amount of open space converted to other uses, and all alternatives would have equal potential to render existing open space inaccessible for recreational uses through development. Because conversion would mostly occur on privately held lands that generally are not open to the public, none of the alternatives are expected to reduce recreational opportunities for a substantial segment of the population. However, there may be situations where covered activities (e.g., construction of a public facility) would convert County-owned open space to another use. Such facilities would be needed under any alternative, so the alternative would be more likely to affect the locations of potential public facilities than their extents.

The differences between the alternatives arise primarily from 1) the way in which mitigation for impacts on the proposed covered species would be implemented and managed and 2) the ability to complete improvements for recreation projects where ESA-compliance requirements are an issue. The following subsections compare the potential impacts of the alternatives.

Under the action alternatives, implementation of park or trail improvement projects would be streamlined because compliance with ESA requirements would be met through the HCP rather than by avoiding all unauthorized impacts. In addition, some lands set aside for mitigation would be accessible to the public and would provide new recreational opportunities compatible with species protection. Because the No Action Alternative would not involve the establishment of conservation lands to mitigate impacts to ESA-listed species, it would not generate any such opportunities.

3.7.2.1 No Action Alternative

Under the No Action Alternative, construction and management of County-owned parks, trails, and open spaces would occur only at sites where impacts to ESA-listed species can be avoided or where the activities could be implemented in accordance with the provisions of the 4(d) rule for Mazama pocket gophers.

As noted in the description of the affected environment, ESA-listed species are known to be present at several sites where the County expects to implement trail and park management activities in the

next 30 years. ESA-compliance issues are likely to arise at other sites, as well, as other sites are added to the park network. For projects with no federal involvement, the County and project proponents would bear the responsibility for avoiding violations of the take prohibitions in ESA Section 9. If impacts to ESA-listed species could not be avoided, and the activities are not excluded from take prohibitions by a 4(d) special rule for the affected species, the activity would likely be redesigned or deferred to avoid impacts. As a result, the requirement to avoid take could limit the type and extent of recreation improvements the County could provide in certain areas.

Because the distribution of ESA-listed species in Thurston County is somewhat patchy, maintenance or improvements to park or recreational facilities with ESA-listed species would be more limited under the No Action Alternative compared to the action alternatives.

Under the No Action Alternative, the County may face constraints on improvement and maintenance projects in some parks and other recreation areas where habitat for ESA-listed species is present. It is assumed that the funding and staffing resources that would have been used for projects that are scaled back or deferred to avoid take would be directed toward projects that can be implemented where impacts to ESA-listed species can be avoided (or where allowed under the 4(d) rule for *Mazama* pocket gophers). Impact fees associated with new developments support the County's ability to acquire new parks under the No Action. As a result, implementation of the No Action Alternative would not reduce recreational opportunities for a substantial segment of the population. Adverse impacts on recreation under the No Action Alternative are expected to be minor and not significant.

3.7.2.2 Proposed Action

Under the Proposed Action, actions affecting recreation opportunities would include park maintenance and improvements, as well as conservation land acquisition and management. The effects of land use changes on recreation are likely to be the same under the Proposed Action as described for the No Action Alternative because the majority of development will occur on lands not currently designated for public recreational purposes. Additionally, the County would seek to maintain or improve the level of service for recreation as populations grow, regardless of alternative. Therefore, this analysis focuses on impacts of the Proposed Action on recreation facilities and recreational opportunities.

Park or trail maintenance and improvement projects would be streamlined because the activities would be covered by the HCP, so pre-project site evaluations to detect occupancy of covered species would no longer be necessary. These maintenance and improvement projects would be implemented as described in the HCP with measures to minimize and mitigate the impacts of the taking on covered species. Park maintenance and improvements that have been deferred due to a likelihood of impacts to covered species would occur under the Proposed Action.

As noted above, ESA-listed species are known to be present at several sites where the County expects to implement trail and park management activities in the next 30 years. These projects, and the mitigation needed to fully offset the resultant take of covered species, are factored into the calculations of take and mitigation in the HCP. As a result, these projects could be implemented with greater certainty and lower costs than under the No Action Alternative, with resultant benefits to recreational opportunities.

In addition to the specific park improvement projects identified above, the take authorization available under the Proposed Action would streamline trail maintenance projects countywide.

Additional park improvements at yet-to-be identified locations would also occur under the Proposed Action. The types of recreational facility improvements expected are summarized in the Thurston County's Parks, Open Space, and Trails Plan (Thurston County 2020c), Chapter 9 of the Comprehensive Plan, Environment, Recreation, and Open Space (Thurston County 2020e), or other county-adopted documents.

Under the Proposed Action, the County would establish a network of conservation lands according to criteria described in the HCP, including but not limited to, areas in each Mazama pocket gopher service area in contiguous units of at least 50 acres. By encouraging mitigation in larger blocks under a County-coordinated conservation network, the Proposed Action would likely increase the amount of undeveloped open space accessible to recreational users. The exact amount of conservation land open to public access and available for compatible recreation would depend on the provisions of the long-term management plans for individual conservation sites. Depending on site-specific conditions, such plans would vary with regard to restrictions (either seasonal or year-round) on public access as well as the recreational activities that are deemed compatible with conservation goals. We assume conservation lands on working agricultural sites would be closed to public access. Access to existing reserves would be unlikely to change, except for short periods when access may be limited for habitat management purposes, such as during a controlled burn. County-owned conservation lands would be open to the public on an appointment basis for research and education-related work.

Under the Proposed Action, approximately 2,698 acres of new reserves would be established in at least five distinct portions of the county (Table 3-2). We cannot predict how much of the area in those new reserves would be publicly accessible. Most new reserves would likely be open to nonmotorized recreation with limited closures for seasonal habitat management activities. Walking trails and low-impact uses would be compatible with management objectives at most new reserves. The availability of these open spaces would increase the availability of recreational opportunities, consistent with the County's goal of acquiring undeveloped natural areas and open spaces (Thurston County 2020c, 2020e). Based on these findings, the Proposed Action would not reduce recreational opportunities for a substantial segment of the population, and it would likely improve recreational opportunities, compared to the No Action Alternative. As such, the Proposed Action would not have a significant negative effect on recreational opportunities or access.

3.7.2.3 Modified HCP Alternative

The Modified HCP Alternative would provide the same benefits as the Proposed Action, in terms of expediting ESA compliance for park or trail improvement projects.

The Modified HCP Alternative may also increase the amount of undeveloped land accessible to recreational users. Similar to the Proposed Action, the amount of this increase cannot be predicted. Because mitigation under this alternative would be accomplished only through the establishment of new reserves (and would not include the establishment of working-land easements that would be closed to public access), the Modified HCP Alternative would likely result in more lands becoming available for public access that is compatible with covered species management compared to the Proposed Action. Approximately 3,109 acres of new reserves would be established under this alternative, compared to 2,697 under the Proposed Action (Table 3-2). As a result, the significant adverse impacts on recreation under the Modified HCP Alternative are expected to be minor because implementation would not reduce recreational opportunities for a substantial segment of the population.

3.7.2.4 Avoidance, Minimization, and Mitigation Measures

In accordance with 40 CFR § 1502.16 and WAC 197-11-440(6)(c)(iii), this analysis considers other appropriate mitigation measures not already included in the proposed action or alternatives to address impacts related to recreation. Under existing regulations, summarized in Section 3.7.1, mitigation measures related to recreation are generally managed through local planning and local taxes that are common to all alternatives. As described above, the action alternatives include measures intended to avoid, minimize, and mitigate impacts to covered species, which support beneficial outcomes for recreation. These measures are not expected to result in significant adverse effects on recreation.

No additional avoidance or mitigation measures are included in the action alternatives. Nothing in this EIS is intended to limit the mitigation authorities of other agencies, should additional mitigation responsibilities be identified while planning, permitting, or carrying out individual activities.

3.8 Socioeconomics and Environmental Justice – Social and Economic Environment

Socioeconomic resources include the social and economic factors that affect the human environment. They include historic and forecasted population, housing and employment growth, changes in specific demographic and economic trends, and the effects of these changes on the economic conditions of the communities experiencing these changes. It also includes identifying disproportionate effects on minority and low-income populations.

The potentially affected area for socioeconomic resources is the entirety of Thurston County and is referred to as “study area,” “the county,” or “Thurston County” in this section. While the permit area excludes incorporated cities, state land, federal lands, and long-term forestry management lands, these excluded areas are part of the countywide economy. Given how local and regional economies are intertwined, the effects of future development in unincorporated lands on socioeconomic and environmental justice throughout incorporated and unincorporated areas of Thurston County are considered together for the purpose of this EIS. While most of the discussion presented in this section is at the county level, data are also presented separately for the UGAs and unincorporated rural county (i.e., the approximately 412,228 acres where Thurston County may conduct, permit, or approve activities), where possible. This EIS also considers economic impacts on affected landowners and social well-being through the analysis of environmental justice in this section.

3.8.1 Affected Environment

This section provides a demographic and economic overview of the residents and the socioeconomic conditions within the study area. Therefore, the geographic scope of the information presented includes Thurston County, the seven incorporated cities within the County and associated UGAs (including Grand Mound UGA), the two Indian reservations (Chehalis and Nisqually), and unincorporated rural areas (to the extent data is available for these).

The data used for the economic and socioeconomic analyses in this Draft EIS are the most recent available or published data from reliable sources. All efforts are made to ensure that these data are updated to their latest release year. The County recently completed an economic analysis of development feasibility under the proposed HCP as compared to the status quo (Thurston County 2021b). In contrast to this EIS, that analysis assumed that all zoning in unincorporated Thurston County will remain unchanged in perpetuity. As described in Section 2.1.1, we assume incremental zoning revisions would occur under any alternative in support of the community’s growth and in compliance with state and local procedures.

This subsection describes reasonably foreseeable environmental trends pertinent to socioeconomic and environmental justice in the study area. Aside from individual County-permitted development activities and periodic updates to TCCP, consistent with reasonably foreseeable environmental trends, no other planned actions specific to this environment discipline have been identified.

3.8.1.1 Population Trends and Projections

Thurston County has been one of the fastest-growing counties in Washington State over the past several decades, consistently exceeding the state’s overall rate of growth (OFM 2020). As shown in Table 3.8-1, the present (2020) population of Thurston County is 291,000, accounting for approximately 4.0 percent of the population of Washington State (TRPC 2019d). The seven incorporated cities and UGAs in the

county house the majority of the population (69.3 percent), while another 30.4 percent of the population resides in the rural unincorporated part of the county.¹

The population of Thurston County increased by 15.4 percent between 2010 and 2020 (TRPC 2019d). Based on available data (TRPC 2019d), most jurisdictions within the county experienced growth during this period (see Table 3.8-1). The only exception is the Tumwater UGA, which had a population decline of about 47.6 percent between 2010 and 2020. However, this is due to the annexation of Tumwater's Eastside UGA, which resulted in adding more than 3,000 residents to the City effective January 1, 2016 (City of Tumwater 2015). At 24.4 percent, the growth rate within the incorporated cities was much higher than the 10.0 percent in the rural unincorporated parts of the county.

Population projections through 2045 for Thurston County and the jurisdictions within the county are shown in Table 3.8-1. Between 2020 and 2045, the county population is projected to increase by 31.8 percent, to reach 383,500 (TRPC 2019d). At 51.5 percent, the highest percentage increase is anticipated in the UGAs, followed by the incorporated cities (36.9 percent). Population in the rural unincorporated parts of the county is anticipated to increase by only 11.0 percent during this period of projection (TRPC 2019d). We expect trends through 2045 described in the best available analysis to continue relatively similarly through 2050, the analysis period of this EIS.

¹ The remaining 0.3 percent of the County population resides on the Chehalis and Nisqually reservations.

Table 3.8-1. Population and Population Growth

Jurisdiction		Population					Population Growth (%)			
		2010	2020	2030	2040	2045	2010-2020	2020-2030	2030-2040	2020-2045
Bucoda	Total	562	580	685	765	800	3.2%	18.1%	11.7%	37.9%
Lacey	City	42,393	52,910	55,060	57,020	57,790	24.8%	4.1%	3.6%	9.2%
	UGA	33,170	37,190	47,270	52,660	55,590	12.1%	27.1%	11.4%	49.5%
	Total	75,560	90,100	102,330	109,680	113,380	19.2%	13.6%	7.2%	25.8%
Olympia	City	46,478	54,150	63,010	69,800	72,070	16.5%	16.4%	10.8%	33.1%
	UGA	11,840	12,640	13,390	14,600	15,600	6.8%	5.9%	9.0%	23.4%
	Total	58,320	66,790	76,400	84,400	87,670	14.5%	14.4%	10.5%	31.3%
Rainier	City	1,794	2,210	2,570	3,075	3,165	23.2%	16.3%	19.6%	43.2%
	UGA	110	115	120	135	160	4.5%	4.3%	12.5%	39.1%
	Total	1,905	2,325	2,690	3,210	3,325	22.0%	15.7%	19.3%	43.0%
Tenino	City	1,695	1,850	2,315	2,755	2,795	9.1%	25.1%	19.0%	51.1%
	UGA	15	15	15	15	45	0.0%	0.0%	0.0%	200.0%
	Total	1,710	1,865	2,330	2,770	2,840	9.1%	24.9%	18.9%	52.3%
Tumwater	City	17,371	24,600 ⁽¹⁾	31,680	35,930	36,900	41.6% ⁽¹⁾	28.8%	13.4%	50.0%
	UGA	6,350	3,330 ⁽¹⁾	7,040	9,020	9,180	-47.6% ⁽¹⁾	111.4%	28.1%	175.7%
	Total	23,720	27,930	38,720	44,950	46,080	17.7%	38.6%	16.1%	65.0%
Yelm	City	6,848	9,400	17,390	23,920	25,890	37.3%	85.0%	37.6%	175.4%
	UGA	1,355	1,405	1,380	1,420	1,670	3.7%	-1.8%	2.9%	18.9%
	Total	8,205	10,805	18,770	25,340	27,560	31.7%	73.7%	35.0%	155.1%
Grand Mound UGA	Total	1,345	1,395	2,270	2,665	2,745	3.7%	62.7%	17.4%	96.8%
Chehalis Reservation	Total	64	75	65	65	65	17.2%	-13.3%	0.0%	-13.3%
Nisqually Reservation	Total	575	775	870	905	930	34.8%	12.3%	4.0%	20.0%

Table 3.8-1. Population and Population Growth (continued)

Jurisdiction	Population					Population Growth (%)			
	2010	2020	2030	2040	2045	2010-2020	2020-2030	2030-2040	2020-2045
<i>Total Cities</i>	117,141	145,700	172,700	193,250	199,410	24.4%	18.5%	11.9%	36.9%
<i>Total UGAs²</i>	54,180	56,090	71,480	80,520	84,990	3.5%	27.4%	12.6%	51.5%
<i>Rural Unincorporated County³</i>	80,300	88,370	90,890	95,950	98,110	10.0%	2.9%	5.6%	11.0%
<i>Total Reservations⁴</i>	639	850	930	970	990	33.0%	9.4%	4.3%	16.5%
Thurston County Total	252,264	291,000	336,000	370,700	383,500	15.4%	15.5%	10.3%	31.8%

Estimates are for April 1 and reflect city limits on that date. A decrease in UGA population is likely due to annexation. Numbers may not sum due to rounding.

¹ Tumwater's Eastside UGA annexation resulted in adding more than 3,000 residents to the City effective January 1, 2016 (City of Tumwater 2015).

² Urban Growth Area (UGA): Unincorporated area designated to be annexed into city limits over 20 years' time to accommodate urban growth.

³ Rural Unincorporated County is the portion of the unincorporated county that lies outside UGA and Reservation boundaries.

⁴ Reservations: estimate is for Thurston County portion of reservation only.

Source: TRPC 2019d (Population Estimates and Forecast).

3.8.1.2 Employment and Major Industries

Data on total and industry employment provide important insights into the size, strength, and diversity of an economy. Total employment and employment projections in Thurston County and its various jurisdictions are presented in Table 3.8-2. According to the Thurston Regional Planning Council (TRPC 2019a), there were roughly 148,700 jobs in Thurston County in 2017, which are projected to increase by 44 percent by 2045 to approximately 214,100 jobs (65,400 additional jobs).²

Employment projections are also important to determine the direction of the regional economy. As shown in Table 3.8-2 and Figure 3.8-1, an additional 21,040 jobs are forecast to be created in Lacey and UGA and another 20,370 in Olympia and UGA by year 2045, while total employment is expected to increase by more than 65,000 jobs (about 44 percent increase) in Thurston County during that period (TRPC 2019a).

Employment by industry shows the role that various industries play in local and regional economies. As presented in Table 3.8-2, overall, the three largest economic sectors in Thurston County in 2017 were state government, which accounted for about 16.0 percent of the employment base, followed by health care and social assistance, providing 11.6 percent of total employment, and professional services, providing 11.2 percent of jobs. The three leading sectors in the rural unincorporated part of the county are agriculture, forestry and fishing, mining (14.7 percent), professional services (13.4 percent), and construction (11.2 percent). Per Table 3.8-2, the largest increase in jobs in Thurston County between 2017 and 2045 is anticipated in the arts, entertainment, and recreation sector (176.5 percent), followed by other services (145.3 percent) and tribal enterprise (71.4 percent). The agriculture, forestry and fishing, mining sectors are anticipated to see a 2.6 percent decline in jobs by 2045.

² These projections are based on the best publicly available data on projected employment within Thurston County. The data used do not take into account the potential effect of the unprecedented unemployment in 2020–2021 due to the COVID-19 pandemic on long-term employment trends.

Table 3.8-2. Employment Projections by Industry and Jurisdiction

Industry		Bucoda	Lacey & UGA	Olympia & UGA	Rainier & UGA	Tenino & UGA	Tumwater & UGA	Yelm & UGA	Grand Mound UGA	Chehalis Res.	Nisqually Res.	Rural Unincorp.	Total
Ag., Forestry and Fishing, Mining	2017	0	530	150	20	0	340	130	30	60	0	2,520	3,800
	2045	0	520	140	20	0	330	130	30	60	0	2,470	3,700
	% Change	0.0%	-1.9%	-6.7%	0.0%	0.0%	-2.9%	0.0%	0.0%	0.0%	0.0%	-2.0%	-2.6%
Utilities	2017	0	10	160	0	0	20	0	0	0	0	40	200
	2045	0	10	130	0	0	20	0	0	0	0	40	200
	% Change	0.0%	0.0%	-18.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Construction	2017	0	2,010	1,550	40	20	1,530	260	40	10	50	1,920	7,400
	2045	10	2,370	1,910	40	30	1,730	400	50	10	60	1,990	8,600
	% Change	1000.0%	17.9%	23.2%	0.0%	50.0%	13.1%	53.8%	25.0%	0.0%	20.0%	3.6%	16.2%
Manufacturing	2017	0	840	1,310	10	20	1,760	10	40	0	0	360	4,300
	2045	0	1,070	1,350	10	20	2,130	60	80	0	0	370	5,100
	% Change	0.0%	27.4%	3.1%	0.0%	0.0%	21.0%	500.0%	100.0%	0.0%	0.0%	2.8%	18.6%
Wholesale Trade	2017	0	620	780	10	20	1,210	70	50	0	0	430	3,200
	2045	0	1,800	980	10	30	1,760	200	90	0	0	430	5,300
	% Change	0.0%	190.3%	25.6%	0.0%	50.0%	45.5%	185.7%	80.0%	0.0%	0.0%	0.0%	65.6%
Retail Trade	2017	10	4,700	6,640	20	130	2,480	910	250	0	0	800	15,900
	2045	20	7,250	8,120	40	240	3,550	1,720	310	0	0	840	22,100
	% Change	100.0%	54.3%	22.3%	100.0%	84.6%	43.1%	89.0%	24.0%	0.0%	0.0%	5.0%	39.0%
Transportation and Warehousing	2017	10	1,100	620	10	70	680	60	40	0	0	710	3,300
	2045	10	1,210	760	10	170	750	100	40	0	0	740	3,800
	% Change	0.0%	10.0%	22.6%	0.0%	142.9%	10.3%	66.7%	0.0%	0.0%	0.0%	4.2%	15.2%
Information	2017	0	350	810	0	20	110	90	10	0	0	160	1,600
	2045	0	360	810	10	30	110	100	10	0	0	160	1,600
	% Change	0.0%	2.9%	0.0%	0.0%	50.0%	0.0%	11.1%	0.0%	0.0%	0.0%	0.0%	0.0%

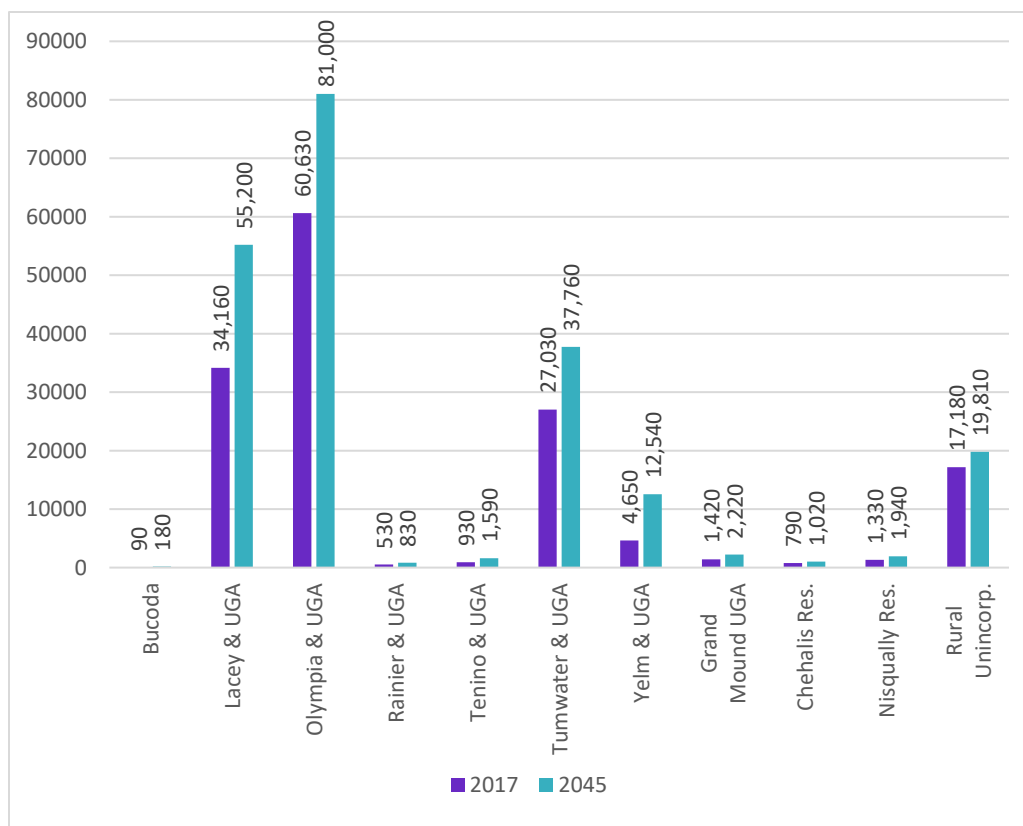
Table 3.8-2. Employment Projections by Industry and Jurisdiction (continued)

Industry		Bucoda	Lacey & UGA	Olympia & UGA	Rainier & UGA	Tenino & UGA	Tumwater & UGA	Yelm & UGA	Grand Mound UGA	Chehalis Res.	Nisqually Res.	Rural Unincorp.	Total
Finance and Insurance	2017	0	1,130	2,130	10	30	560	190	30	0	0	490	4,600
	2045	10	2,190	2,920	30	70	950	650	40	0	0	630	7,500
	% Change	1000.0%	93.8%	37.1%	200.0%	133.3%	69.6%	242.1%	33.3%	0.0%	0.0%	28.6%	63.0%
Real Estate, Rental, and Leasing	2017	10	1,860	1,960	30	20	690	190	10	0	10	1,020	5,800
	2045	10	2,510	2,500	60	70	980	480	20	0	10	1,160	7,800
	% Change	0.0%	34.9%	27.6%	100.0%	250.0%	42.0%	152.6%	100.0%	0.0%	0.0%	13.7%	34.5%
Professional Services	2017	20	4,900	6,480	80	160	2,130	440	90	0	10	2,310	16,600
	2045	30	8,170	8,950	120	210	3,330	1,850	120	0	20	2,600	25,400
	% Change	50.0%	66.7%	38.1%	50.0%	31.3%	56.3%	320.5%	33.3%	0.0%	100.0%	12.6%	53.0%
Education Services	2017	0	1,360	1,280	10	20	380	170	20	0	0	520	3,800
	2045	0	1,810	2,290	20	30	500	320	20	0	0	580	5,600
	% Change	0.0%	33.1%	78.9%	100.0%	50.0%	31.6%	88.2%	0.0%	0.0%	0.0%	11.5%	47.4%
Health Care and Social Assistance	2017	20	3,890	9,730	50	60	1,580	490	40	0	10	1,390	17,300
	2045	20	6,250	13,230	80	120	2,540	1,580	70	0	20	1,610	25,500
	% Change	0.0%	60.7%	36.0%	60.0%	100.0%	60.8%	222.4%	75.0%	0.0%	100.0%	15.8%	47.4%
Arts, Entertainment, and Recreation	2017	0	470	550	0	10	410	50	10	0	0	210	1,700
	2045	10	1,510	1,450	10	20	860	540	20	0	0	270	4,700
	% Change	1000.0%	221.3%	163.6%	1000.0%	100.0%	109.8%	980.0%	100.0%	0.0%	0.0%	28.6%	176.5%
Accommodation and Food Services	2017	10	2,640	4,270	20	70	1,180	480	710	0	0	440	9,800
	2045	20	3,780	5,040	40	170	1,710	920	760	0	0	470	12,900
	% Change	100.0%	43.2%	18.0%	100.0%	142.9%	44.9%	91.7%	7.0%	0.0%	0.0%	6.8%	31.6%
Other Services	2017	10	2,200	3,520	40	30	1,020	240	60	0	20	1,430	8,600
	2045	30	6,520	7,040	100	120	2,850	2,210	150	0	20	2,060	21,100
	% Change	200.0%	196.4%	100.0%	150.0%	300.0%	179.4%	820.8%	150.0%	0.0%	0.0%	44.1%	145.3%

Table 3.8-2. Employment Projections by Industry and Jurisdiction (continued)

Industry		Bucoda	Lacey & UGA	Olympia & UGA	Rainier & UGA	Tenino & UGA	Tumwater & UGA	Yelm & UGA	Grand Mound UGA	Chehalis Res.	Nisqually Res.	Rural Unincorp.	Total
Federal Government	2017	0	400	990	10	10	150	50	0	0	0	60	1,700
	2045	0	450	1,120	20	10	170	60	0	0	0	70	1,900
	% Change	0.0%	12.5%	13.1%	100.0%	0.0%	13.3%	20.0%	0.0%	0.0%	0.0%	16.7%	11.8%
State Government	2017	0	2,480	12,680	0	0	8,500	0	0	0	0	160	23,800
	2045	0	3,590	16,010	0	0	10,330	0	280	0	0	200	30,400
	% Change	0.0%	44.8%	26.3%	0.0%	0.0%	21.5%	0.0%	0.0%	0.0%	0.0%	25.0%	27.7%
State Education	2017	0	40	530	0	0	0	0	0	0	0	850	1,400
	2045	0	40	670	0	0	10	0	0	0	0	1,080	1,800
	% Change	0.0%	0.0%	26.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	27.1%	28.6%
Local and Tribal Government	2017	0	730	2,800	10	30	1,390	140	0	0	510	450	6,100
	2045	0	1,100	3,420	20	30	1,720	290	0	0	610	490	7,700
	% Change	0.0%	50.7%	22.1%	100.0%	0.0%	23.7%	107.1%	0.0%	0.0%	19.6%	8.9%	26.2%
Local Education	2017	0	1,910	1,690	140	210	920	690	0	0	0	900	6,500
	2045	0	2,580	2,140	190	220	1,440	930	0	0	0	1,520	9,000
	% Change	0.0%	35.1%	26.6%	35.7%	4.8%	56.5%	34.8%	0.0%	0.0%	0.0%	68.9%	38.5%
Tribal Enterprise	2017	0	0	0	0	0	0	0	0	720	710	0	1,400
	2045	0	100	0	0	0	0	0	140	940	1,190	30	2,400
	% Change	0.0%	1000.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1400.0%	30.6%	67.6%	300.0%	71.4%
Total	2017	90	34,160	60,630	530	930	27,030	4,650	1,420	790	1,330	17,180	148,700
	2045	180	55,200	81,000	830	1,590	37,760	12,540	2,220	1,020	1,940	19,810	214,100
	% Change	100.0%	61.6%	33.6%	56.6%	71.0%	39.7%	169.7%	56.3%	29.1%	45.9%	15.3%	44.0%

Source: TRPC 2019a (Employment Estimates by Industry, 2017 to 2045).



Source: TRPC 2019a (Employment Estimates by Industry, 2017 to 2045).

Figure 3.8-1. Employment Projections by Jurisdiction

3.8.1.3 Environmental Justice Considerations

The EPA's Office of Environmental Justice offers the following definition of environmental justice:

The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.

The concept of environmental justice is rooted in the Civil Rights Act of 1964, which prohibited discrimination in federally assisted programs, and in Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations," issued February 11, 1994. Executive Order 12898 was intended to ensure that federal actions and policies do not result in disproportionately high adverse effects on minority or low-income populations. Environmental justice issues are mandated and regulated at the federal level, and compliance with NEPA requires analysis of environmental justice effects. As such, effects of the alternatives on environmental justice are evaluated in this EIS.

The remainder of this section presents the background for an analysis of environmental justice, which refers to the fair and equitable treatment of individuals regardless of race, ethnicity, or income level in the development and implementation of environmental management policies and actions. Therefore, the key socioeconomic parameters addressed here are race and ethnicity, as well as measures of social

and economic well-being, including median household income, poverty rates, and unemployment rates. This section also looks at a potentially vulnerable group in Thurston County: rural landowners, especially those associated with farming.

Race and Ethnicity

The racial and ethnic composition of the populations of Thurston County and its jurisdictions is presented in Table 3.8-3 and Figure 3.8-2. Generally, the racial and ethnic makeup of Thurston County is less diverse than statewide conditions. The predominant racial group in the County is White (Caucasian), comprising roughly 81.5 percent of the countywide population in 2018 (U.S. Census Bureau 2020). The largest racial minority group in the county is persons of “Two or More Races” (5.8 percent), followed closely by Asian (5.7 percent). Other racial minority groups, combined, represent about 6.8 percent of the local population, led by Black/African American (3.0 percent), American Indian and Alaska Native (AIAN) (1.7 percent), person of “Some Other Race” (1.3 percent), and Native Hawaiian or Other Pacific Islander (NHOPI) (0.9 percent). In terms of ethnicity, only 8.6 percent of Thurston County population is Hispanic or Latino, compared to 12.5 percent in the state.

Relative to the county, the cities and UGAs are somewhat more diverse overall, with higher proportions of Blacks/African Americans, Asians, persons of “Some Other Race,” and persons of “Two or More Races” (U.S. Census Bureau 2020). The percentage of Hispanics or Latino population is also slightly higher in the cities compared to unincorporated portions of the county. Populations in the unincorporated rural parts of the county are less diverse than the in county overall, with most areas having lower percentages of all racial minority and ethnic groups than local cities (U.S. Census Bureau 2020).

The Council on Environmental Quality identifies these groups as minority populations when either:

- The minority population of the affected area exceeds 50 percent, or
- The minority population percentage in the affected area is meaningfully greater than the minority population percentage in the general population or appropriate unit of geographical analysis.

In order to be classified as meaningfully greater, a local population must exceed the total minority population by 10 percent; in Washington State, this threshold is 34 percent. Thurston County’s minority population is approximately 28.5 percent, which does not exceed the state minority population by 10 percent. In terms of the other local jurisdictions analyzed, only the two Indian reservations (Chehalis and Nisqually) exceed this threshold due to the larger AIAN populations. These areas would not fall within the area where the County conducts, permits, or approves activities. Nevertheless, given the proximity of these areas to the County permit areas, the discussion of socioeconomic environment includes these communities.

Table 3.8-3. Population by Racial and Ethnic Groups

Jurisdiction	Total Population	Race ¹						Ethnicity	
		White	Black/ African American	AIAN	Asian	NHOPI	Other Race	Two or More Races Total	Hispanic or Latino ²
Bucoda	689	678 98.4%	0 0.0%	4 0.6%	0 0.0%	0 0.0%	7 1.0%	0 0.0%	25 3.6%
Lacey	47,852	34,573 72.2%	2,841 5.9%	679 1.4%	4,351 9.1%	821 1.7%	842 1.8%	3,745 7.8%	5,286 11.0%
Olympia	50,836	41,915 82.5%	1,434 2.8%	553 1.1%	3,730 7.3%	203 0.4%	712 1.4%	2,289 4.5%	4,278 8.4%
Rainier	2,346	1,966 83.8%	164 7.0%	3 0.1%	47 2.0%	20 0.9%	11 0.5%	135 5.8%	170 7.2%
Tenino	1,695	1,512 89.2%	9 0.5%	22 1.3%	11 0.6%	0 0.0%	4 0.2%	137 8.1%	144 8.5%
Tumwater	22,500	19,272 85.7%	391 1.7%	109 0.5%	899 4.0%	124 0.6%	215 1.0%	1,490 6.6%	1,497 6.7%
Yelm	8,772	7,085 80.8%	115 1.3%	207 2.4%	448 5.1%	69 0.8%	166 1.9%	682 7.8%	935 10.7%
Grand Mound	3,189	2,588 81.2%	0 0.0%	141 4.4%	23 0.7%	0 0.0%	0 0.0%	437 13.7%	674 21.1%
Chehalis Reservation ³	922	479 52.0%	1 0.1%	411 44.6%	0 0.0%	13 1.4%	0 0.0%	18 2.0%	151 16.4%
Nisqually Reservation ³	666	167 25.1%	14 2.1%	430 64.6%	9 1.4%	16 2.4%	0 0.0%	30 4.5%	48 7.2%
<i>Total Cities and UGAs</i>	137,879	109,589 79.5%	4,954 3.6%	1,577 1.1%	9,486 6.9%	1,237 0.9%	1,957 1.4%	8,478 6.1%	12,335 8.9%
<i>Total Reservations ³</i>	1,588	646 40.7%	15 0.9%	841 53.0%	9 0.6%	29 1.8%	0 0.0%	48 3.0%	199 12.5%
<i>Total Unincorporated</i>	139,994	117,548 84.0%	3,449 2.5%	2,362 1.7%	6,312 4.5%	1,141 0.8%	1,560 1.1%	7,622 5.4%	11,629 8.3%
Thurston County	279,461	227,783 81.5%	8,418 3.0%	4,780 1.7%	15,807 5.7%	2,407 0.9%	3,517 1.3%	16,148 5.8%	24,163 8.6%
Washington State	7,294,336	5,545,997 76.0%	269,854 3.7%	95,048 1.3%	607,429 8.3%	48,043 0.7%	311,170 4.3%	416,795 5.7%	911,573 12.5%

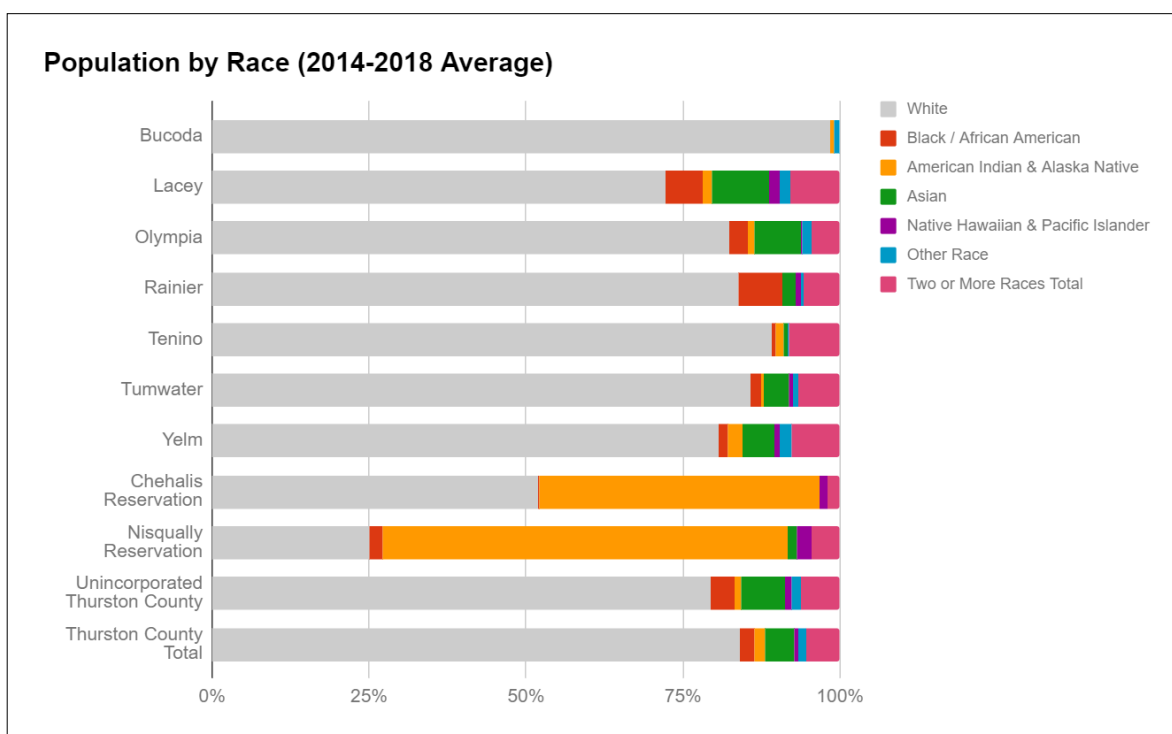
¹ AIAN – American Indian and Alaska Native; NHOPI – Native Hawaiian or Other Pacific Islander.

² These may belong to any race.

³ Data are for reservations and off-reservation trust lands as a whole, including those portions outside Thurston County.

GRAY HIGHLIGHT – higher than Thurston County.

Source: U.S. Census Bureau 2020 (2014-2018 American Community Survey 5-Year Estimates; Table reference numbers B02001 and B03002).



Source: TRPC 2020d (Race and Ethnicity).

Figure 3.8-2. Population by Race

Income-Related Measures of Social Well-Being³

As derivatives of total personal income, median household income and poverty rates are widely used economic indicators of social well-being in addition to unemployment rates. Table 3.8-4 presents these socioeconomic data for Thurston County and the various jurisdictions within the County.

In 2018, the unemployment rate in Thurston County was 6.9 percent, while those in Lacey and Olympia were 6.8 percent and 6.3 percent, respectively (U.S. Census Bureau 2020). Rainier had the highest unemployment rate (14.1 percent), followed by Bucoda (14.0 percent) and Grand Mound (10.6 percent).⁴

According to the 2014-2018 American Community Survey 5-year estimates (U.S. Census Bureau 2020), Thurston County's median household income was estimated at \$69,592. This represents the fifth-highest median household income of all counties in Washington, behind only King, Snohomish, Clark, and Kitsap Counties. The community with the highest median household income (in inflation-adjusted

³ Thurston County is in the process of conducting a separate and more in-depth analysis of the potential economic impacts resulting from the HCP. The data and arguments presented below will be updated to consider the information and results provided in that study, if it is finalized before development of the final EIS.

⁴ These unemployment rates are based on the best publicly available data from a reliable source for jurisdictions within Thurston County. The data presented do not represent the unprecedented unemployment in 2020–2021 due to the COVID-19 pandemic, especially with regards to its potential effect on long-term unemployment trends.

2018 dollars) was Rainier (\$69,417), followed by Lacey (\$66,675). There is, however, disparity between some local and countywide conditions in the context of median household incomes. Bucoda had the lowest median household income among Thurston County communities (\$41,875). These data are not readily available for rural unincorporated part of the county.

About 11.0 percent of Thurston County’s population (29,718 people) lived below the federal poverty level based on the 2014-2018 American Community Survey (U.S. Census Bureau 2020). In 2018, the federal poverty threshold was \$12,784 for a one-person household. An analysis was conducted to compare the poverty rates in the various jurisdictions to that in Thurston County. These data suggest that the poverty rates in five jurisdictions are higher than that for Thurston County. At 40.1 percent, the poverty rate was much higher in Bucoda, followed by Tenino (17.0 percent), Olympia (16.7 percent), Rainier (16.3 percent), and Grand Mound (14.8 percent). For this analysis, these communities are considered to be low income.

Table 3.8-4. Population, Income, Poverty Rates, and Unemployment Rates

Jurisdiction	Population	Median Household Income	Poverty Rate	Unemployment Rate
Bucoda	689	\$41,875	40.1%	14.0%
Lacey	47,852	\$66,675	10.0%	6.8%
Olympia	50,836	\$58,606	16.7%	6.3%
Rainier	2,346	\$69,417	16.3%	14.1%
Tenino	1,695	\$55,774	17.0%	7.6%
Tumwater	22,500	\$65,167	9.6%	5.8%
Yelm	8,772	\$65,377	10.1%	8.9%
Grand Mound	3,189	\$61,384	14.8%	10.6%
Chehalis Reservation	922	\$56,875	N/A	N/A
Nisqually Reservation	666	\$59,167	N/A	N/A
Rural Unincorporated County	N/A	N/A	N/A	N/A
Thurston County	274,684	\$69,592	11.0%	6.9%
Washington State	7,294,336	\$70,116	11.5%	5.3%

N/A = Not Readily Available.

GRAY HIGHLIGHTING – Significantly higher than County average.

Source: U.S. Census Bureau 2020 (2014-2018 American Community Survey 5-Year Estimates).

Rural Landowners

Rural landowners are considered more vulnerable to the effects of the alternatives because of their more common exposure to ESA-listed species as well as their socioeconomic conditions. For the purpose of this discussion, rural landowners include landowners and residents of the unincorporated rural parts of Thurston County as well as those in the more rural UGAs (per the discussion in Section 3.6, UGAs for smaller cities such as Rainier, Tenino, and Yelm are more rural in terms of land use). As noted earlier, about 30.4 percent of the population of Thurston County (88,370) resides in unincorporated rural areas, while a little over 1.0 percent (2,930) are housed in the smaller UGAs (Rainier, Tenino, Yelm, and Grand Mound) (TRPC 2019a).

A notable proportion (14.7 percent) of residents of unincorporated rural parts of the county are involved in agriculture and related professions. Additional rural residents conduct agricultural activities for personal non-commercial purposes. Agricultural jobs in the area are anticipated to decline by about 2.0 percent by 2045 in that part of the County (TRPC 2019a). The overall employment growth in the unincorporated rural parts of the county is forecast at only 15.3 percent between 2020 and 2045, which

is very low compared to the 44.0 percent employment growth in the county overall. However, because of the short commuting distances involved, many of the rural residents may obtain urban employment, so the geographic disparity in job growth between urban and rural Thurston County does not indicate as severe of an employment disparity among residents of these areas.

Data on the median household income, poverty rates, and unemployment rates are available at countywide scales, but not at scales that allow assessment of these metrics for “rural landowners” within the county. Therefore, this analysis looks at data related to the largest employment sector in that area, agriculture, as a surrogate for impacts on rural landowners. Trends in agricultural employment is a meaningful socioeconomic metric for rural landowners. As presented in Table 3.8-5, there are about 1,200 farms in Thurston County spread over 62,250 acres of land (13.5 percent of total land in the County) (NASS 2017). The average size of a farm in the county is 52 acres.

Table 3.8-5. Overview of Farms in Thurston County

	Washington State	Thurston County
Number of Farms	35,793	1,200
Land in Farms (in acres)	14,679,857	62,250
Proportion of Land Area in Farms (%)	34.5	13.5
Average Size (in acres)	410	52
Average Net Cash Farm Income of Operations ¹	\$47,641	\$23,496
Farms with Net Gains ²	12,244	283
Farms with Net Losses	23,549	917
Farms with Sales Values Less than \$25,000	75.5%	88.3%
Farms with Sales Values Less than \$50,000	80.7%	92.7%
Farms with Sales Values Less than \$100,000	84.5%	93.9%
Farms with Sales Values \$100,00 or More	15.5%	6.1%

¹ This concept is derived by subtracting total farm expenses from total sales, government payments, and other farm-related income. Depreciation is not used in the calculation of net cash farm income.

² Includes those operations that broke even.

Source: NASS 2017 (2017 Census of Agriculture – Quick Stats; tables 1, 3, 4, 6, and 8 for Washington Counties).

About 93.9 percent of these farms have annual sales values of less than \$100,000. Given that the U.S. Department of Agriculture defines a small farm as an operation with gross cash farm income under \$250,000 (USDA 2017), these are considered small farms. It is not clear from the data how many of the remaining 6.1 percent farms are small (with annual sales values of less than \$250,000).

It is anticipated that within that group of small farms are commercial and noncommercial farms. While most farms in the U.S. are small (91 percent according to the Census of Agriculture), large farms account for 85 percent of the market value of agricultural production (USDA 2017). Moreover, the number of small commercial farms, as well as their share of sales, has shrunk over time. This trend is evident in data regarding gains and losses in terms of net cash farm income of operations presented in Table 3.8-5. In Thurston County, 917 farms suffered net losses in 2017, while only 283 experienced net gains in farm income. Also, the average net cash farm income of operations for farms in the county is only \$23,496 compared to \$47,641 in Washington State (NASS 2017). All these indicators point to the vulnerabilities of a fairly large portion of rural landowners in the county.

3.8.2 Environmental Consequences

This section outlines the potential socioeconomic and environmental justice effects of the Proposed Action, No Action, and the Modified HCP Alternative. It focuses on the two main areas of potential effects: economic resources and environmental justice. This analysis considers the reasonably foreseeable environmental trends and planned actions (collectively described above as the affected environment) together with each alternative in order to assess the environmental effects of the alternatives on socioeconomics and environmental justice.

The following criterion was used to determine significance of impacts of Proposed Action and alternatives on socioeconomics: impacts would be significant if implementation would result in measurable changes in the population or community and social relationships or result in measurable economic impacts.

An alternative would have significant adverse impacts on environmental justice if implementation would result in:

- Actions that could lead to a potential reduced income/employment to minority or low-income communities, or
- Actions that could lead to an impediment to economic development in low-income or minority communities.

Based on the resources evaluated, socioeconomic and environmental justice effects are anticipated within the study area for socioeconomics analysis (Thurston County), but these are expected to range from negligible to beneficial for the two action alternatives. Under the No Action Alternative, there could potentially be significant negative socioeconomic effects on landowners impacted by ESA-listed species occupancy.

3.8.2.1 No Action Alternative

Under the No Action Alternative, no ITP would be issued to Thurston County and no HCP would be implemented. This alternative would constitute a continuation of current practices in Thurston County. Thurston County would continue to conduct, permit, and approve activities in the permit area in compliance with the Thurston County Code, including the CAO and state and federal requirements. The County and individual project proponents would be responsible for evaluating each project for ESA compliance. For projects in modeled habitat, the cost and legal liability for site inspections and ESA compliance would be borne by the project proponent through direct costs and costs of extended planning timelines to assess habitat or species occupancy consistent with the best available science, for any ground-disturbing projects that may be proposed in habitat for ESA-listed species.

According to the Draft HCP, which forecasts a certain amount of take of each covered species that may result from otherwise legal construction or maintenance activities, a small number of activities throughout Thurston County jurisdiction would be negatively impacted each year by take avoidance measures. There would, therefore, continue to be a heavy regulatory burden on property owners developing land where ESA-listed species may be present (TRPC 2019e). The time and cost of screening individual projects for occupancy by ESA-listed species may be different in different cases, but those could potentially be significant, along with the uncertainties this creates for project planners. Without a countywide ITP, actions on sites with ESA-listed species would be modified to avoid take wherever possible or may even be deferred indefinitely. As discussed previously in this report, future individual HCPs are not anticipated, and individual ITPs are not reasonably foreseeable. Without an ITP, projects that are not able to avoid impacts to ESA-listed species would not proceed. This results in a negative

impact on socioeconomic conditions of affected landowners and project proponents under the No Action Alternative. At the same time, as discussed in more detail later in this section, the County is expected to be able to meet growth demands and, between that and the sporadic distribution of ESA-listed species, is likely to disperse these impacts, so these negative impacts would not prevent development from meeting growth needs at the local or countywide scales. Even so, this could be a significant negative outcome on the socioeconomics of the affected landowners and project proponents.

Under the No Action Alternative, development and county maintenance projects would occur only at sites where prohibited impacts to ESA-listed species can be avoided. This would not restrict activities that could be implemented in accordance with the 4(d) rule for *Mazama* pocket gophers or other threatened species. Individual development activities could occur at a slower pace and/or be delayed due to permitting requirements. While there is uncertainty in the magnitude of site-specific costs, the economic analysis conducted separately by the County determined development costs would be higher under current conditions than under the Proposed Action on the overwhelming majority of parcels in their analysis (Thurston County 2021b), resulting primarily from current procedures to demonstrate compliance with the ESA.

Even with the slower procedures for development permitting and take avoidance under the No Action Alternative, the growth needs of the community would be met, and no reduction in countywide development or revenue trends would be expected because there is sufficient developable land at a countywide scale, and zoning can be updated to address growth needs. As a result, there are no negative effects anticipated on countywide development trends and there would be no measurable fiscal impacts on County revenues, as through business taxes, sales taxes, and other municipal revenues would increase commensurate with development and community growth. While the County's separate economic analysis does identify negative outcomes from not adopting the HCP, there is a worst-case scenario in which zoning is assumed not to change. This EIS, in contrast, assumes that otherwise legal updates to strategic development plans, comprehensive plans, and localized zoning would occur to support otherwise legal development.

Based on the above analysis, no measurable changes in the population or community or interrelated social impacts are expected under this alternative. Consistent with existing trends, negative economic impacts would result for individual project proponents who wish to develop lands occupied by ESA-listed species. These impacts would be most profound to the individual landowners or project proponents, not to the countywide economics, resulting in a significant negative economic trend being maintained by the No Action Alternative in this portion of the affected environment.

Environmental Justice Effects

Under the No Action Alternative, project proponents undertaking activities in modeled habitat for ESA-listed species, such as new construction, adding an accessory structure, or septic extension or repair would be required to conduct occupancy screening for ESA-listed species. If ESA-listed species are present, take avoidance measures may range from altering, or delaying, to canceling the project. As discussed earlier, rural property owners are a potential vulnerable group due to their location and their socioeconomic disparities, compared to residents of larger cities. The County's economic analysis shows the trend for rural landowners throughout Thurston County jurisdiction would be higher development costs under this Alternative than the Proposed Action, and that gap would grow over time (Thurston County 2021b). While a small number of parcels concentrated in the northern portion of the county, southwest of Tumwater and Olympia, were forecasted in the County's analysis to have lower development costs under this alternative than the Proposed Action, this would be a very limited exception to the

foreseeable trends. In addition, rural landowners include lower-income, minority, and other vulnerable sub-populations, who could be further disproportionately affected by the No Action Alternative, as their ability to alter projects for take avoidance or to bear costs and delays for occupancy screening may be limited.

Typically, changes in county revenues could disproportionately affect programs for lower-income, minority, and other vulnerable populations. However, as discussed previously, given that the county buildout is expected to meet growth needs, reduction in county revenues is not anticipated in this case, and there would be no effect on these programs under the No Action Alternative.

Under the No Action Alternative, the significant negative socioeconomic trends resulting from ESA-listed species occupancy will continue to impact rural landowners and project proponents, which would include low-income or minority populations, as described in Section 3.8.1.3. This negative socioeconomic impact results from the currently applicable take avoidance measures, which apply throughout the habitat for ESA-listed species in Thurston County, and are not disproportionately applied to any demographic among rural landowners and project proponents. As a result, the negative socioeconomic outcomes described above are not a significant negative environmental justice outcome.

3.8.2.2 Proposed Action

The Proposed Action would establish a multi-species conservation program to minimize and mitigate the impacts of the incidental take of covered species that would result from the covered activities. As part of the conservation program, the HCP would establish standardized assumptions about impacts to ESA-listed species, based on the best available information on species distribution, habitat quality, and landscape position. The Implementation of this process would simplify, streamline, and coordinate the approaches to tracking impacts to ESA-listed species and approving requests for County permits. The County would also coordinate the establishment and long-term management of conservation sites, encouraging the implementation of mitigation in a number of consolidated areas throughout the County, representative of the relative impacts to each covered species. Under the HCP, project proponents would be required to obtain a County permit for covered activities that result in unavoidable impacts to covered species. Proponents would apply to the County for a certificate of inclusion under the ITP (HCP Appendix J). The streamlined procedures for County-issued permits created by the HCP would improve the predictability of the permitting process for developers and residents, eliminating uncertainty and delays related to species occupancy assessments that characterize the No Action Alternative.

Under the Proposed Action, the time and uncertainty associated with ESA compliance would be reduced when compared to the No Action Alternative. As a result, the pace of site-specific development activities could increase (see discussion in Section 2.1.3).

To secure a certificate of inclusion under the ITP, proponents of development or maintenance projects with identified impacts to modeled habitat for ESA-listed species would pay a mitigation fee (or dedicate eligible land to conservation; see Section 2.1.3.4). The mitigation fee would be based on the type and extent of impacts and would be in addition to normal county permit fees. Implementation of this process under the Proposed Action would streamline the permitting process for project proponents and provide increased certainty for projects proposed in modeled habitat for covered species. By managing conservation for at a countywide scale, this process would efficiently fund and implement conservation projects. In addition, the HCP creates economic opportunities for landowners seeking to maintain the rural character of the county through the HCP's conservation program.

Over the 30-year ITP term, approximately 433 acres are anticipated to go into conservation easements on working lands for the HCP (Table 2.1-3), in addition to the fee acquisitions made by the County for

the conservation program. The economics surrounding easements stem from the idea that the use of the land is conditioned in perpetuity. Under the HCP, easements and conservation acquisitions would be made with willing landowners or willing sellers. This can have multiple economic impacts, including a new revenue source for the property owner from sale of the easement, and the ability to use the property's conservation benefits in agricultural product marketing. A conservation easement would extinguish certain development rights and identify conservation values to be protected on the identified portion of the property. The separate economic analysis conducted by the County incorporates a worst-case scenario comparing the Proposed Action to the status quo (current zoning in perpetuity) and concludes there would be economic benefits to landowners, project proponents, and county revenues resulting from this strategy (Thurston County 2021b). For this analysis, the available information indicates a positive economic opportunity from the Proposed Action for landowners on lands occupied by ESA-listed species may result from the HCP's conservation program.

The conservation of open space under the Proposed Action could have the effect of increasing property values of the surrounding land. These increases could result in beneficial impacts to the tax base. However, many spatial characteristics of the conserved land affect this, such as size, shape, and spatial location.

The Proposed Action would not result in any negative fiscal impacts on county revenues given that the growth needs of the community are anticipated to be met under this alternative. In fact, it is expected that the negative impacts of the No Action Alternative on landowners discussed earlier are alleviated by implementing their activities under the HCP.

Overall, it is anticipated that by providing tools to maintain working lands and by permanently managing reserves, the Proposed Action would help slow the loss of agricultural jobs and would create some land management jobs. Therefore, the Proposed Action would not result in adverse impacts to employment, income, and tax base. The County's separate economic analysis quantified these effects by comparing the Proposed Action to the status quo, and found benefits to employment, income, taxes, and county revenues would result from the Proposed Action (Thurston County 2021b). In contrast to that analysis, this EIS acknowledges that zoning revisions would occur over time. While this difference in assumptions may reduce the magnitude of economic benefits expected from the Proposed Action through this analysis, both analyses supports the conclusion that the Proposed Action improves the foreseeable trends related to socioeconomics compared to the No Action Alternative.

The Proposed Action would improve regulatory certainty and streamline the permitting process for project proponents. The Proposed Action would also create economic incentives for conservation and improve predictability of development costs. For these reasons, the Proposed Action would resolve the negative socioeconomic trends associated with ESA-listed species described under the No Action Alternative. We anticipate these positive economic effects will offset the incremental increase in County permit fees associated with HCP implementation. The HCP would have no adverse impacts on county revenues, employment, income, or the tax base. As such, the Proposed Action would result in no adverse socioeconomic changes in the population or community and social relationships or other economic impacts, and no significant adverse impacts would occur.

Environmental Justice Effects

Rural property owners who undertake one of the covered activities (e.g., added accessory structures, septic extension or repair) would benefit from the regulatory certainty and streamlined procedures established by the HCP. While they would face mitigation fees under the Proposed Action, resulting in some effects on their income, the HCP fees are less burdensome than implementing take avoidance measures under the No Action Alternative. Because the Proposed Action provides regulatory certainty that landowners can develop consistent with their zoning potential, creates economic value for

occupied habitat through the conservation program, and provides support for working lands, this alternative has the most positive effects on environmental justice among the alternatives. Potential inequities among landowners in modeled habitat, landowners with ESA-listed species, and other landowners are resolved to the greatest degree practicable given the County's multiple objectives.

As discussed earlier, rural property owners are a potential vulnerable group due to their location and their socioeconomic disparities compared to those residing in larger cities. The County's separate economic analysis quantified these effects. Their analysis forecasts lower costs and improved cost feasibility for development to parcel-scale zoning potential for the overwhelming majority of landowners and project proponents in Thurston County jurisdictions, not limited to rural populations (Thurston County 2021b). In addition, rural landowners include lower income, minority, and other vulnerable sub-populations. It is anticipated that the rural property owners would not be disproportionately negatively affected by the Proposed Action because it would resolve the socioeconomic disparity associated with development costs and uncertainty compared to the No Action Alternative.

Typically, changes in county revenues could disproportionately affect programs for lower income, minority, and other vulnerable populations. However, as discussed previously, given that the county buildout is expected to meet growth needs, reduction in county revenues is not anticipated in this case, and there would be no effect on these programs under the Proposed Action.

In conclusion, the Proposed Action is not anticipated to disproportionately negatively affect the low-income and minority communities within the study area through reduced income/employment or through impeding their economic development.

3.8.2.3 Modified HCP Alternative

The primary difference between this alternative and the Proposed Action would be in the network of conservation lands. Under this alternative, mitigation for unavoidable impacts to covered species would be provided only on new reserves with permanent conservation easements, but conservation lands would not remain working lands. All conservation lands or easements would be acquired from willing parties, would be conserved, restored to the highest practical habitat targets, and maintained to conserve covered species. The same number of functional acres of occupied habitat would be protected under both action alternatives. This alternative would not support working lands as well as the Proposed Action, and it would not allow for the dedication of land in lieu of fee (except in extremely rare circumstances). As a result, compared to the Proposed Action, the Modified HCP Alternative would not provide as great a benefit to rural landowners.

The potential socioeconomic effects of the Modified HCP Alternative are anticipated to be similar to those of the Proposed Action, but the effects would be slightly reduced for some agricultural landowners. No measurable changes in the population or community or interrelated social impacts are expected under this alternative. Also, the Modified HCP Alternative is not anticipated to disproportionately negatively affect the low-income and minority communities within the study area through reduced income/employment or through impeding their economic development.

3.8.2.4 Avoidance, Minimization, and Mitigation Measures

In accordance with 40 CFR § 1502.16 and WAC 197-11-440(6)(c)(iii), this analysis considers other appropriate mitigation measures not already included in the proposed action or alternatives to address impacts related to socioeconomics and environmental justice. Under existing regulations, summarized in Section 3.8.1, mitigation measures related to socioeconomics and environmental justice are generally managed through local planning and public services that are common to all alternatives. As described above, the action alternatives include measures intended to avoid, minimize, and mitigate impacts to

covered species, which create some foreseeable minor costs associated with covered activities, described above. These measures are not expected to result in significant adverse effects on socioeconomics and environmental justice, and no additional avoidance or mitigation measures are proposed for inclusion in the action alternatives. Nothing in this EIS is intended to limit the mitigation authorities of other agencies, should additional mitigation responsibilities be identified while planning, permitting, or carrying out individual activities.

3.9 Aesthetics, Light, and Glare

The study area for aesthetics, light, and glare includes all of Thurston County. Although the permit area for the alternatives only includes lands where the County has jurisdiction, changes in the quality of the visual landscape may be perceived by viewers at any location throughout the county, regardless of jurisdictional boundaries. In addition, activities on lands where the County has jurisdiction may generate light or glare that is visible in nearby areas, which may include incorporated cities, tribal lands, and lands under state or federal control.

3.9.1 Affected Environment

This subsection describes reasonably foreseeable environmental trends pertinent to aesthetics, light, and glare in the study area. Aside from individual County-permitted development activities and periodic updates to the TCCP, consistent with reasonably foreseeable environmental trends, no other planned actions specific to this environmental discipline have been identified.

The geography of Thurston County is aesthetically diverse and includes urban, rural, and agricultural lands as well as shorelines, forests, and open spaces. The county is primarily made up of prairies and rolling grasslands but also includes coastal lowlands in the north, the foothills of the Cascade Range in the southeast, and minor hills in between. The vegetation varies throughout the county and is a major visual element because of the large swaths of undeveloped land. The county also contains three major river basins (Nisqually River, Deschutes River, and Black River) and more than 100 lakes and ponds (Thurston County 2020e).

Since the mid-nineteenth century, much of Thurston County has been used for logging and agriculture, and these land uses still dominate rural parts of the county. Forested areas, primarily those dominated by conifers, make up approximately 60 percent of the total land cover. Agricultural lands in the county include large-scale commercial farms, small-scale family farms, livestock farms, and orchards.

Approximately 93 percent of the county is unincorporated, and the remaining area is divided among the seven incorporated cities and towns of Olympia, Lacey, Tumwater, Bucoda, Rainier, Tenino, and Yelm. Residential and limited commercial land uses generally spread outward from concentrated urban areas along transportation corridors, with low-density residential areas in between. As required by the Washington State GMA, the TCCP includes measures to preserve rural character by ensuring visual compatibility of rural development with surrounding areas and reducing the inappropriate conversion of undeveloped land into sprawling, low-density development. The land use goals and policies in the Comprehensive Plan aim to contain development so that vegetation, open space, and the natural landscape predominate over the built environment as found in traditionally rural areas and communities.

The natural features of Thurston County are generally grouped by geographic area. The northern portion of the county is situated at the southern end of Puget Sound and has more than 120 miles of marine coastline along four peninsulas. Much of the land on the peninsulas is devoted to residential uses, but topographic features such as bluffs, beaches, and river deltas are also present. The cities of Olympia,

Lacey, and Tumwater, surrounded by the county's UGAs, are located at the bases of the peninsulas and are the most densely populated areas in Thurston County.

The central portion of the county mainly includes rolling prairie interspersed with conifer and Oregon white oak trees. Native prairie vegetation includes a diverse variety of grasses (e.g., Roemer's fescue) and culturally significant species (e.g., camas). This area includes the town of Bucoda and the city of Tenino, which has a historic downtown that is listed on the National Register of Historic Places.

The eastern portion of the county is bound by the Nisqually River along the eastern border and the Cascade foothills to the southeast. Most of the southeastern portion of the county is forested and designated for long-term forestry. The cities of Yelm and Rainier are the most densely populated areas in this portion of the county and are surrounded by primarily residential land uses. JBLM extends into eastern Thurston County and this portion of the base is largely undeveloped.

The western portion of the county includes the Black Hills and Capitol State Forest, which are densely vegetated with conifers and designated for long-term forestry. Capitol Peak is the highest point in the county at 2,664 feet and is surrounded by other smaller but similar peaks such as Larch Mountain and Rock Candy Mountain. The Black River winds through the western portion of the county and eventually joins the Chehalis River, which cuts through the southwestern corner of the county.

Other notable features that contribute to the visual character of Thurston County include the distinctive geological features of the Mima Mounds Natural Area Preserve and nearby prominent mountains, such as Mount Rainier to the southeast and the Olympic Mountains to the northwest. Landscape aesthetics are a subjectively important local value, reflected by the County's goal to maintain the rural character of Thurston County, even as growth and development trends proceed.

3.9.2 Environmental Consequences

The County and USFWS have determined that an alternative could have significant adverse impacts on visual resources (i.e., aesthetics, light, and glare) if implementation would result in development that is incompatible with visual landscapes that are traditionally found in rural areas and communities.

Significant impacts would also occur if implementation would result in a substantially increased rate of noncompliance with County policies and regulations pertaining to light and glare. This analysis considers the reasonably foreseeable environmental trends and planned actions (collectively described above as the affected environment) together with each alternative in order to assess the environmental effects of the alternatives on aesthetics, light, and glare.

Residential development and the other activities described in Chapter 2 would continue to occur under all of the alternatives, and the alternatives do not differ in their requirements pertinent to visual resources or light and glare. As such, all alternatives could have the following impacts on visual resources:

- Conversion of undeveloped open space, native vegetation, and natural terrain to residential, commercial, or industrial uses
- Increased light and glare in areas where residential, commercial, or industrial development occurs

Accessory structures, septic repair/extension, removal of underground storage tanks, transportation and infrastructure maintenance projects, and water resource management projects are not expected to affect visual resources.

As discussed in Chapter 2, the degree of development activities would be similar under all alternatives. Over the next 30 years, development of residential-zoned properties is expected to increase from its current level (58 percent of capacity) to approximately 70 percent of capacity, within current zoning

allowances (see Section 2.1.1.4 for more information about anticipated buildout). All projects would be guided by county zoning and land use codes that condition aesthetics, light, and glare, particularly resulting from development activities. While aesthetics are usually conditioned through zoning, off-site light and glare are locally regulated in a manner not altered by alternatives. Likewise, implementation of the other activities described in Chapter 2 would be similar under the No Action Alternative and the action alternatives during the same period. As a result, the alternatives are not expected to differ in amount of open space converted to other uses, and activities conducted, permitted, or authorized by the County under all alternatives would have an equal potential to affect visual resources.

Under any of the alternatives, all activities conducted, permitted, or authorized by the County would be required to comply with the TCCP and subarea plans, which include requirements to assure the visual compatibility of rural development with surrounding rural areas and policies that consider light and glare for land use compatibility. As a result, none of the alternatives would have significant adverse impacts on visual resources.

Because County-permitted development projects and County infrastructure activities are unlikely to result in significant adverse impacts on this resource, the county-scale differences between the alternatives arise primarily from the mitigation for impacts on the proposed covered species. Under the action alternatives, mitigation would be coordinated and implemented in consolidated areas. Conservation areas would not be established under the No Action Alternative. At individual sites, the alternatives would also vary in site-specific outcomes on sites occupied by ESA-listed species. On these sites, individual projects that would not occur under the No Action Alternative, may occur under the action alternatives, provided they remain consistent with zoning and local code. The following subsections compare the potential impacts of the alternatives.

3.9.2.1 No Action Alternative

Under the No Action Alternative, implementation of activities conducted, permitted, or authorized by the County would modify the visual character of the landscape and would contribute to increased light and glare near developed areas. Because implementation of these activities would comply with applicable policies and zoning standards, they would not be incompatible with the visual character of surrounding areas or result in the inappropriate conversion of undeveloped land into sprawling, low-density development. Further, avoiding impacts to ESA-listed species where they occur would not impact aesthetics light and glare because development activity that avoids these impacts would also be subject to applicable policies and zoning standards. As such, these activities would not be expected to result in significant adverse impacts on visual resources because they would not result in development that is incompatible with visual landscapes that are traditionally found in rural areas and communities.

3.9.2.2 Proposed Action

Similar to the No Action Alternative, activities implemented under the Proposed Action would modify the visual character of the landscape and would contribute to increased light and glare near developed areas.

Under the Proposed Action, the County would accommodate development and maintenance activities consistent with local zoning and codes and would coordinate mitigation in consolidated blocks of land. The Proposed Action would result in a network of lands with natural, open-space aesthetics and ensured management in grassland and wetland areas. In contrast, the No Action Alternative would not include the establishment and long-term maintenance of open spaces as mitigation for impacts to ESA-listed species. In addition, areas prioritized for acquisition as conservation sites would include those with diverse native plant communities and would occur in each of the Mazama pocket gopher service areas, providing for a

geographic distribution of permanent conservation lands. As a result of these factors, the establishment of conservation sites under the Proposed Action would contribute to the long-term maintenance of a higher-quality visual landscape compared to the No Action Alternative, and thus no significant adverse impacts are expected to result from the Proposed Action with regard to aesthetics, light, and glare.

3.9.2.3 Modified HCP Alternative

Similar to the No Action Alternative and the Proposed Action, activities implemented under the Modified HCP Alternative would modify the visual character of the landscape and would contribute to increased light and glare near developed areas. In contrast to the No Action Alternative, and similar to the Proposed Action, the Modified HCP Alternative would result in the creation of blocks of land with consistency in landform, vegetation, and land use. Because mitigation under this alternative would be accomplished only through the establishment of new reserves (rather than including enhancements of existing reserves and the establishment of working-land easements), this alternative would maintain slightly fewer blocks of land in an open-space condition compared to the Proposed Action, with relatively similar aesthetic benefits. Similar to the Proposed Action, no significant adverse impacts would be expected to result from the Modified HCP Alternative with regard to aesthetics, light, and glare.

3.9.2.4 Avoidance, Minimization, and Mitigation Measures

In accordance with 40 CFR § 1502.16 and WAC 197-11-440(6)(c)(iii), this analysis considers other appropriate mitigation measures not already included in the proposed action or alternatives to address impacts related to aesthetics, light, and glare. Under existing regulations, summarized in Section 3.9.1, measures to avoid, minimize, or mitigate impacts on surrounding land uses related to aesthetics, light, and glare are generally managed through local planning, zoning, and building codes that are common to all alternatives.

Under any alternative, all County-authorized projects would be required to comply with the TCCP and subarea plans, which include requirements to assure the visual compatibility of rural development with surrounding rural areas.

Under the action alternatives, several of the HCP's measures to avoid or minimize impacts on covered species (HCP, Appendix C) would reduce the visual impacts of covered activities at localized scales. These measures would be applied where compatible with project objectives, and include, but are not limited to, clustering multiple structures and development activities (e.g., staging areas and access points), configuring development activities to maximize patches of undisturbed habitat, planting host and nectar/food plants for butterflies and other pollinators, and maintaining movement corridors and larger contiguous areas of undeveloped habitat for covered species. Likewise, the mitigation for take of covered species provided under either action alternative would protect open spaces as conservation lands, supporting the rural visual character the County seeks to maintain through long-term planning.

As described above, the action alternatives are not expected to result in significant adverse effects on aesthetics, light, and glare. No additional avoidance or mitigation measures are included in the action alternatives. Nothing in this EIS is intended to limit the mitigation authorities of other agencies, should additional mitigation responsibilities be identified while planning, permitting, or carrying out individual activities.

3.10 Historic and Cultural Resources – Archaeological, Historic, Cultural, Indian Trust Resources

This section describes the affected environment for historic and cultural resources and effects on resources that would result from the Proposed Action and alternatives. For this analysis, historic and cultural resources specifically relate to archaeological resources as well as buildings, structures, and objects per 36 CFR 800. The study area for this analysis is defined as Thurston County's jurisdictional area (412,228 acres), in which changes associated with the activities described in Chapter 2 could affect historic and cultural resources.

While activities analyzed in this EIS would occur at currently unknown locations in the County's jurisdictional area, we used the HCP's proposed ITP coverage for activities in modeled habitat to estimate the extent of activities related to this analysis. County projects outside this area are not modified by the alternatives and do not depend on a federal action.

All activities analyzed under the alternatives would occur in the modeled habitat for covered species in the County's jurisdiction, which totals 102,849 acres. However, the actual extent of activities and modeled habitat is likely less because the 102,849-acre value is the sum of overlapping areas affected by activities that may impact each covered species (HCP Table 2.2). Based on information provided by Thurston County (HCP Tables 4.4 and 4.5), over 30 years, within modeled habitat, up to 6,726 acres could be impacted through new or redeveloped residential, commercial/industrial, landfill/solid waste management, or other public service facilities. Ground disturbance on an additional 2,495 acres would result from activities related to water resources management, transportation maintenance, County park and land management, and other County-authorized actions (such as accessory structures and septic repair) to support existing land uses. In addition, under the Proposed Action, land management for mitigation would occur on up to 3,469 acres of conservation lands, of which up to approximately 2,698 acres would be new reserves (Table 3-2). The remainder of conservation lands would be working lands and existing reserves where management would be ongoing.

For historic and cultural resources, the affected environment is identified by the areas where ground-disturbing activities that require or result from ITP coverage would occur under the alternatives, such as County-authorized development, County infrastructure activities, and mitigation site management. As a result, National Historic Preservation Act (NHPA) consultation for historic and cultural resources is likely to focus on the 12,690-acre area within the 102,849 acres of modeled habitat in Thurston County's jurisdiction where ground-disturbing activities could impact historic and cultural resources. This informs our analysis in regard to the potential exposure of historic and cultural resources to the alternatives within the affected environment. However, because that area includes up to 5,188 acres where activities would support existing land uses (e.g., infrastructure maintenance, some mitigation site management), the actual affected environment for this resource is likely smaller. As discussed in greater detail below, the County would seek to avoid, minimize, and mitigate both indirect and direct impacts on historic and cultural resources resulting from the No Action Alternative, in accordance with applicable law. Likewise, under the action alternatives, USFWS would likely also have a cooperative role in avoiding, minimizing, and mitigating indirect and direct impacts on historic and cultural resources, in accordance with applicable law, if a programmatic agreement is reached.

3.10.1 Regulatory Requirements

Federal and state laws and regulations require agencies to consider the effects of an action on historic and cultural resources. These laws and regulations set forth processes for compliance, define the

responsibilities of the party proposing the action, and prescribe the relationship among other agencies, such as the Washington State Department of Ecology, the Washington State Department of Archaeology and Historic Preservation (DAHP), and the Advisory Council on Historic Preservation (ACHP). The NHPA (54 USC §300101 et seq.) is the centerpiece of federal legislation protecting historic and cultural resources.

Section 106 of the NHPA prohibits federal agencies from funding or approving an undertaking unless the agency first considers the potential effects of the project on any historic properties that are listed on or eligible for listing in the National Register. The USFWS considers ITP issuance to be an undertaking that is subject to Section 106 compliance. Consistent with Section 106 requirements, USFWS proposes consultation with DAHP, affected tribes, and other parties, as appropriate, under Section 106.

As part of the NHPA compliance process, USFWS must identify the geographic Areas of Potential Effect (APE) for historic properties. The USFWS anticipates the precise scope of the APE associated with those activities would be finalized through Section 106 consultation, which may result in a programmatic agreement to further address NHPA compliance for individual projects. While this NEPA analysis will help to inform future USFWS Section 106 compliance efforts, USFWS does not intend the NEPA process to be used in lieu of Section 106 procedures set out in 36 CFR §§ 800.3-800.6.

The State of Washington also requires compliance with the historic and cultural resource management laws and regulations under the GMA, the TCCP, the Thurston County Historic Register Program, the County's role as a Certified Local Government, RCW 27.53 Archaeological Sites and Resources, RCW 27.44 Indian Graves and Records, and RCW 68.50.645 Skeletal Human Remains—Duty to Notify. The latter regulation provides a strict process for notification of law enforcement and other interested parties in the event of the discovery of any human remains, regardless of inferred cultural affiliation.

The County's proposed approval of the HCP and its subsequent adoption by the Thurston County Board of County Commissioners require review under SEPA, conducted here with Thurston County as the SEPA lead agency. This EIS is prepared jointly by the County and USFWS to meet respective SEPA and NEPA requirements.

SEPA requires that impacts to historic and cultural resources be considered during the public environmental review process; local development proposals subject to SEPA and all zoning changes evaluated under SEPA consider adverse impacts to historic resources and may require avoidance, minimization, or mitigation. SEPA projects are reviewed by multiple state and local government agencies (including DAHP), Tribes, the Historic Commission, and the public. Under SEPA, DAHP is the sole agency with technical expertise in historic and cultural resources, so DAHP will work with Thurston County on impacts analysis and mitigation for the Proposed Action.

Overall, the County's responsibilities include maintaining a historic preservation commission, promoting the preservation of historic resources, enforcing state or local preservation laws, reviewing National Register Nominations, and providing for public participation in historic preservation activities. USFWS and the County anticipate the County would assume a leading role in ensuring proper consideration of the effects of ITP-related activities on historic and cultural resources within the permit area over the term of the proposed ITP, and in resolution of adverse effects, where appropriate. These roles may be clarified through a programmatic agreement, if reached through Section 106 consultation.

3.10.2 Tribal Consultation

As part of the Section 106 consultation process, triggered by the County's ITP application for the Proposed Action, affected tribes are invited to provide information on the potential historic properties, including properties of religious and cultural significance to tribes.

As part of the SEPA process, affected tribes will also be contacted. If covered activities require individual SEPA review or County processes that integrate the GMA, the project proponent would also engage with concerned tribes. Under SEPA, when the County consults with DAHP, affected or interested tribes would be offered the opportunity to comment.

If an ITP is issued, it may be appropriate for consulting tribes to work directly with the County on historic and cultural resource concerns of importance to tribes, in accordance with and reliance on mutually agreed-to programmatic agreement procedures, if such an agreement is developed. However, USFWS would meet its obligation to conduct government-to-government consultations should a tribe prefer to consult directly with the United States on activities that may affect a tribe's interest in historic properties and cultural resources.

3.10.3 Affected Environment

This subsection describes reasonably foreseeable environmental trends pertinent to historic and cultural resources in the study area. Aside from individual County-permitted development activities and periodic updates to TCCP, consistent with reasonably foreseeable environmental trends, no other planned actions specific to this environment discipline have been identified. This section also presents summary information on Thurston County's historic and cultural resources and identifies and evaluates these resources. Sources of information include numerous cultural resource -related reports, historical works, and Thurston County plans and resource data.

Thurston County is host to a rich history, ranging from pre-European contact (precontact) to modern settlement in Washington State. The historic and cultural resources associated with precontact and early European settler occupation and land use were closely tied to the environment; as both land use and environment have changed, the historic and cultural resources of that time and through time do not exist in their original state today, but remnants remain. Table 3.10-1 describes the historic and cultural setting from precontact to modern Thurston County. DAHP recognizes that archaeological sites are nonrenewable resources that contribute to the collective heritage of the state and maintains a confidential record of known archaeological sites in the state, including Thurston County. Though tribal lands are not within County jurisdiction, there are archaeological and cultural resources of the Nisqually Tribe, Squaxin Tribe, and Confederated Tribes of the Chehalis in many unpublished locations throughout the county that are not included in DAHP's confidential record.

Table 3.10-1. Historic and Cultural Timeline of Thurston County

12,000 – 17,000 BP	Foraging populations relied on smaller game, aquatic animals, plants. Artifacts: leaf-shaped and stemmed points, scrapers, flake tools, blade cores.
13,000 BP	Mobile human society relied heavily on large game (archaeological evidence in Manis, WA outside of Thurston County)
5,000 BP and later	Larger, more complex populations relied on salmon, shellfish, land mammals, plants (berries, roots, bulbs). More complex ground-stone tools, antlers, harpoons.
1775 - 1844	Spanish explorers arrive in Washington State; Wilkes maps northern Thurston County; Hudson Bay Company forts established on Nisqually Delta
1845 - 1869	First European settlers arrive in Thurston County; City of Olympia established as "Smithfield" and later named Olympia; Thurston County created in 1852; Governor and legislature established; Olympia becomes territorial capital; railroad reaches Thurston County
1870 - present	Washington becomes a state and Olympia becomes state capital; railroads, industry, automobiles bring prosperity to Thurston County, resulting in extensive highway system and modern buildings

Sources: Carlson 1983; Ames 2009; Newell 1950

BP = Years Before Present

For this EIS analysis, the proposed permit area of Thurston County includes an inventory of over 8,800 historic properties, some dating to the 1850s, and 307 archaeological sites, most of which are located within Thurston County's cities (DAHP 2020a). Those historic properties of exceptional significance have been added either to the state or national registers of historic places. The NHPA defines a historic (cultural) resource as any prehistoric or historic district, site, building, or object included in, or eligible for inclusion in the National Register of Historic Places (NRHP). This includes "artifacts, records, and remains which are related to such a district, site, building, structure, or object." All resources that meet the specific criteria for inclusion in the NRHP, whether they are formally listed or not, fall under this classification. Only those resources that meet the NHPA criteria are protected under the act. Similarly, RCW 27.53 defines historic archaeological resources as those properties listed or eligible for listing in the Washington State Register of Historic Places (WHR). The WHR is administered by DAHP and the NRHP is administered by the Department of Interior, National Park Service, and DAHP. At the state level, DAHP also administers a register for historic barns, the Washington Heritage Barn Register (WHBR), that represent the agricultural, economic, and cultural development of the state.

Historic resources in Thurston County include buildings and landmarks that have undergone field verification of historic significance based on historic context. The WHR for properties in Thurston County lists those that are more than 50 years old and have been verified to possess architectural or historic importance that have not undergone changes that alter their historic appearance. The process for designation to and removal from the register is included in TCC 2.106.040. A database of historic resources is maintained to include properties that are eligible for listing in the NRHP, are listed in the NRHP and WHR, or are listed on the WHBR. The number of each of these listings for unincorporated Thurston County and Thurston County UGAs as of November 2020 is included in Table 3.10-2.

Table 3.10-2. Recorded Historic Resources in Unincorporated Thurston County, Including UGAs

Jurisdiction	Eligible for NRHP	Listed on NRHP	Listed on WHR	Listed on WHBR
		and WHR		
Grand Mound UGA	0	1	0	0
Lacey UGA	0	2	0	0
Tenino UGA	0	1	0	0
Yelm UGA	0	0	1	0
Unincorporated Thurston County	2	14	4	11

Source: DAHP 2020a.

3.10.4 Environmental Consequences

Effects on historic and cultural resources are defined by 36 CFR 800.16(i) as any alteration to the characteristics of a historic property qualifying it for inclusion in, or eligibility for the NRHP. For this analysis, cultural resources include those whose locations are known and recorded, as well as currently unrecorded sites, and may include tribal cultural resources (such as traditional cultural properties), unique paleontological resources or sites, unique geologic features, or human remains. As the locations of specific covered activities are not known at this time, the potential for impacts to specific historic properties, should any be present, cannot be assessed at this time.

The County and USFWS have determined that an alternative could have significant adverse impacts on historic or cultural resources if implementation would result in substantial adverse changes in the status of such resources or would violate state or federal regulations for management of historic or cultural resources. This analysis considers the reasonably foreseeable environmental trends and planned actions

(collectively described above as the affected environment) together with each alternative in order to assess the environmental effects of the alternatives on historic and cultural resources.

Under any of the alternatives, the potential for effects on historic and cultural resources would exist wherever implementation of covered activities results in grading and other land-disturbing activities (e.g., clearing, grubbing, replanting, and staging of materials and equipment). Mitigation activities implemented for compliance with local, state, or federal requirements (e.g., the Thurston County critical areas code, wetland regulations, or, under the action alternatives, the terms of the ITP) could also entail ground-disturbing work with the potential to affect historic and cultural resources. Adverse effects on historic or cultural resources could include physical alteration of those resources or their setting in a manner that alters the character or use of the resource. Potential impacts could be avoided or mitigated to a less-than-significant level by implementing measures, typically conditioned by the County, or through procedures detailed in a potential programmatic agreement under NHPA. These avoidance measures are primarily included in the County's BMPs, which are standard practice for projects such as those associated with activities conducted, permitted, or authorized by the County, under all alternatives considered in this EIS.

The NHPA Section 106 process is designed to identify possible conflicts between historic preservation objectives and federal undertakings and to resolve those conflicts in the public interest through consultation. Neither NHPA nor ACHP regulations require that all historic properties be preserved, only that the agency consider the effects of any proposed undertaking prior to implementation. County procedures that provide for SEPA review of certain zoning or significant ground-disturbing actions provide the opportunity for site-specific public involvement and tribal consultation with the County prior to the County's final SEPA determination. In comparison, the federal process for compliance with NHPA Section 106 is included in Table 3.10-3.

Table 3.10-3. National Historic Preservation Act Section 106 Compliance Steps and Applicability to the Thurston County HCP

Compliance Step	Definition	Applicability to Thurston County HCP
Cultural Resource Identification	Ensure identification of historic and cultural resources located in Area of Potential Effect (APE) through review of existing documentation, field surveys, and interviews. Requires State Historic Preservation Officer (SHPO) and/or the Tribal Historic Preservation Officer (THPO) input, as applicable, and consultation with affected or potentially affected Native American tribe(s)	The geographic area within which proposed covered activities, conservation measures, and any other ground-disturbing measures required by terms and conditions in an ITP may directly or indirectly cause alterations in the character or use of historic properties
Property Evaluation	Evaluate using NRHP (36 CFR Part 63) in consultation with DAHP. Cultural resources listed in NRHP or eligible for listing are designated historic properties. Historic properties include archaeological sites and historic buildings	Portion of Thurston County jurisdictional area affected by proposed covered activities
Effects Determination	<p>No Historic Properties Affected: No effects or no historic property found, DAHP provided with documentation with concurrence by consulted parties</p> <p>No Adverse Effect: Effects criteria of 36 CFR 800.5(b) results in no adverse effects on historic property(ies); findings require DAHP concurrence</p> <p>Adverse Effect: Adverse effects occur when an undertaking may directly or indirectly alter characteristics of a historic property that qualify it for inclusion in the NRHA in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association (36 CFR 800.5(a)(1)).</p>	

Source: DAHP 2020b.

3.10.4.1 No Action Alternative

Under the No Action Alternative, USFWS would not issue an ITP and would not establish an agreement with terms around historic and cultural resource protection procedures. As such, County-permitted development projects and County infrastructure activities would comply with state laws and regulations, but NHPA compliance would not be explicitly required (except in the case of projects that involve federal funding or approval). Local procedures would provide ongoing means for identifying and protecting historic and cultural resources or for mitigating impacts to those resources. For example, residential zoning decisions and commercial building permits typically trigger SEPA evaluations of direct and indirect impacts to historic and cultural resources, with on-site professional archaeological evaluations where appropriate. Residential and commercial building permits also include inadvertent discovery plans. As a result, the No Action Alternative would not be expected to result in substantial changes to the condition of historic or cultural resources, consistent with current and foreseeable environmental trends for this resource.

As discussed in Section 2.1.2.4, development and infrastructure maintenance projects that are otherwise legal would proceed only where unauthorized impacts to ESA-listed species can be avoided. In locations where ground-disturbing projects are modified or deferred to avoid unauthorized take of ESA-listed species, potential impacts to historic and cultural resources would also likely be minimized or avoided. As discussed in Section 2.1.1.4, the total amount of development activity and infrastructure maintenance under the No Action Alternative is not expected to differ from the total amount under

either action alternative. Because the locations of individual future development or maintenance projects cannot be predicted, it is not possible to determine whether differences in the locations of such projects would translate into differences in the potential for effects on historic or cultural resources. Therefore, because ground-disturbing activity would result from development activity and infrastructure maintenance projects at currently unknown sites, the No Action Alternative would have potential for effects on historic or cultural resources to be identified, avoided, minimized, or mitigated under local procedures.

In contrast to the action alternatives, the No Action Alternative would not include the implementation of mitigation projects at sites established and maintained to mitigate impacts to ESA-listed species because the Thurston County HCP would not be permitted or adopted. As a result, the No Action Alternative would not result in impacts to cultural resources from management of conservation lands.

Projects implemented under the No Action Alternative would comply with state laws and regulations governing protection of historic and cultural resources, as well as with local procedures for identifying and protecting or mitigating impacts to those resources. For this reason, the No Action Alternative would not result in substantial adverse changes in the status of historic and cultural resources or violate state or federal regulations for cultural resource management. As such, the No Action Alternative would have no significant adverse impacts on historic or cultural resources.

3.10.4.2 Proposed Action

Under the Proposed Action, USFWS would issue an ITP authorizing incidental take of covered species resulting from proposed covered activities, most of which would include ground-disturbing activities that, in turn, could result in potential impacts to historic and cultural resources, if present. USFWS would not issue permits for ground-disturbing activities through the ITP. Rather, it would permit the incidental take of species associated with ground-disturbing activities.

The ITP would include mitigation and conservation requirements for impacts to covered species. Mitigation for unavoidable impacts of covered activities on covered species would be accomplished by establishing new reserves on lands purchased from willing sellers, maintaining and enhancing existing habitat reserves, and working with willing landowners to establish conservation easements on working lands. Management of these conservation sites could entail ground disturbance and other earth-moving activities in modeled habitat for covered species, which could inadvertently affect buried or unknown historic or cultural resources.

While it is not expected that monitoring, maintenance, and habitat enhancement on mitigation lands would disturb historic or cultural resources, these conservation activities would be considered further through Section 106 consultation and may be a subject of a programmatic agreement incorporating existing laws, regulations, and policies. If a programmatic agreement is adopted, these conservation activities along with other covered activities that could result in impacts to historic or cultural resources would be subject to the procedural details of such an agreement to identify, avoid, minimize, or mitigate impacts.

Under the Proposed Action, ground-disturbing projects that could impact historic and cultural resources would occur on the same lands as the No Action Alternative, plus areas occupied by ESA-listed species. In addition, the Proposed Action includes permanent management of conservation lands that would include new reserves, agricultural lands, and existing reserves. As a result, the ITP could cause projects to occur in areas occupied by ESA-listed species, including project sites and conservation sites that would not be expected to occur under the No Action Alternative. Due to prior land use, the potential for these actions to affect historic or cultural resources is likely greatest on development sites and new reserves because these are the lands where such resources are most likely to remain intact compared to

continuously managed lands. Even with potential exposure, implementation of local procedures and any procedures agreed to during the proposed Section 106 consultation, would be implemented to identify, avoid, minimize, or mitigate potential impacts to these resources to avoid adverse effects.

Because the Proposed Action would include the same amount of development as the No Action Alternative plus conservation activities at conservation sites, the area affected by ground-disturbing work under this alternative would be greater than under the No Action Alternative and entirely within the same affected environment. Conservation activities could occur on approximately 3,469 acres. The greater area of ground-disturbing work could result in a higher potential for the Proposed Action to impact historic or cultural resources compared to the No Action Alternative. As discussed above, however, the Proposed Action triggers NHPA Section 106 consultation, through which USFWS and consulting parties may develop a programmatic agreement for identification, avoidance, minimization, and mitigation of impacts to historic and cultural resources, where present.

Once established, the projected conservation sites would be protected from development in perpetuity, resulting in beneficial impact to the status of historic or cultural resources on those sites. Because conservation sites are likely to include remaining intact prairies that may have been culturally important sites for local tribes, their conservation would protect unidentified cultural resources. For these reasons, conservation activities implemented under the HCP could contribute to improved protection of historic and cultural resources that occur on lands managed as conservation sites.

As under the No Action Alternative, certain activities would be subject to evaluation on a project-by-project basis pursuant to SEPA and local procedures that provide ongoing means to identify and protect or mitigate impacts to historic and cultural resources. Through the life of the ITP, Thurston County would implement cultural resource assessments through SEPA when properties are re-zoned for residential purposes or proposed for commercial, industrial, or infrastructure development. Additionally, USFWS proposes a programmatic agreement, if determined appropriate through Section 106 consultation, to ensure NHPA compliance for ground-disturbing actions altered by the ITP. Given the County's Certified Local Government status and its responsibility for permitting development projects in the county over the requested 30-year ITP term, USFWS and the County anticipate the County assuming a leading role in consultation and historic property identification, avoidance, minimization, and mitigation for individual projects covered under the ITP, should the ITP be granted. This role would be defined and described further in a programmatic agreement, if developed, incorporating existing laws, regulations, and policies.

As under the No Action Alternative, Thurston County would continue to implement robust procedures to identify, avoid, minimize, and mitigate impacts to historic and cultural resources. Therefore, similar to the No Action Alternative, the Proposed Action would have no significant adverse effects on historic and cultural resources. The Proposed Action would support existing environmental trends that reflect community engagement to protect historic and cultural resources.

3.10.4.3 Modified HCP Alternative

The Modified HCP Alternative explores whether additional protection to covered species would be achieved by emphasizing the management and protection of the highest quality habitat for the conservation network, rather than working lands easements or incremental enhancement of existing reserves as under the Proposed Action. The number, size, and distribution of conservation lands under this alternative are expected to be slightly less than the Proposed Action. Proposed covered activities would be the same as those discussed for the Proposed Action and, through the life of the ITP, project screening would trigger the same reviews for historic and cultural resources protection as the No Action Alternative, and the same NHPA compliance approach as the Proposed Action.

As with the Proposed Action, impacts to historic or cultural resources at conservation sites would be identified and avoided, minimized, or mitigated in advance through local procedures, as appropriate, such as through consultation with DAHP and tribes, and through procedures agreed to under the proposed Section 106 consultation, if any. With new reserves as the conservation lands program under the Modified HCP Alternative, the potential for long-term preservation of cultural resources could be marginally higher than if some of the conservation network consisted of working agricultural lands or existing reserves because the conservation lands could maintain natural cover across areas with minimal prior disturbance. Though because all lands in Thurston County have some management history, this is a very small difference compared to the outcomes for historic and cultural resources under the Proposed Action. If no ground disturbance or vegetation management that would disturb soil were proposed in a conservation site, there would be no potential to affect any archaeological or cultural resources.

As under the No Action Alternative, Thurston County would continue to implement robust procedures to identify, avoid, and mitigate impacts to historic and cultural resources. Under the Modified HCP Alternative, USFWS also proposes Section 106 consultation under which USFWS and SHPO may establish a programmatic agreement, if appropriate to ensure HCP implementing procedures also meet NHPA procedural expectations. Therefore, similar to the No Action Alternative, the Modified HCP Alternative would implement local procedures to avoid adverse effects on historic and cultural resources. Similar to the Proposed Action, the Modified HCP Alternative also includes NHPA compliance procedures through Section 106 consultation. Similar to the Proposed Action and the No Action Alternatives, the Modified HCP Alternative would support existing environmental trends that reflect community engagement to protect historic and cultural resources. With these measures incorporated into this alternative, we anticipate sufficient procedures to ensure the Modified HCP Alternative would have no significant adverse effect on historic and cultural resources, commensurate with the Proposed Action.

3.10.4.4 Avoidance, Minimization, and Mitigation Measures

In accordance with 40 CFR § 1502.16 and WAC 197-11-440(6)(c)(iii), this analysis considers other appropriate mitigation measures not already included in the proposed action or alternatives to address impacts to historic and cultural resources. Under local and state regulations, summarized in Section 3.10.1, mitigation measures related to historic and cultural resources are directly authorized through regulations under the GMA, the TCCP, the Thurston County Historic Register Program, the County's role as a Certified Local Government, RCW 27.53 Archaeological Sites and Resources, RCW 27.44 Indian Graves and Records, and RCW 68.50.645 Skeletal Human Remains—Duty to Notify, and other authorities. These regulations are common to all alternatives.

Under the action alternatives, several of the measures to avoid, minimize, or mitigate impacts to covered species are consistent with common practices to avoid or minimize impacts on historic and cultural resources, if they are present, including minimizing construction-related ground disturbance. Additional measures provided under the action alternatives include establishing special management areas for the Oregon spotted frog and promoting site designs that minimize impacts on intact prairies, wetlands, and wetland buffers, which would protect historic and cultural resources occurring in such areas. In addition, under the action alternatives, USFWS proposes Section 106 consultation with SHPO and Tribes, under which a programmatic agreement may be developed to ensure that procedures also meet NHPA requirements. If a programmatic agreement is reached, it would provide the details, conditions, or procedures related to all other appropriate mitigation to address impacts on historic and cultural resources.

3.11 Transportation

The study area for transportation includes all of Thurston County. While the HCP permit area excludes areas where the County does not have permitting authority, the transportation network within the county is interconnected and cannot function separately. Additionally, temporary traffic impacts during county road maintenance or changes to traffic patterns from county road improvements may extend throughout Thurston County. Therefore, the affected environment is all of Thurston County and includes incorporated cities, tribal lands, and federal and state lands analyzed in addition to unincorporated Thurston County.

Information in this section is based on the TCCP (Thurston County 2020e) and the TRPC What Moves You Regional Transportation Plan (TRPC 2020h). The Comprehensive Plan is updated every 8 years as required by the GMA and outlines the County's planning policies and commitments to building an efficient, multimodal transportation system.

3.11.1 Affected Environment

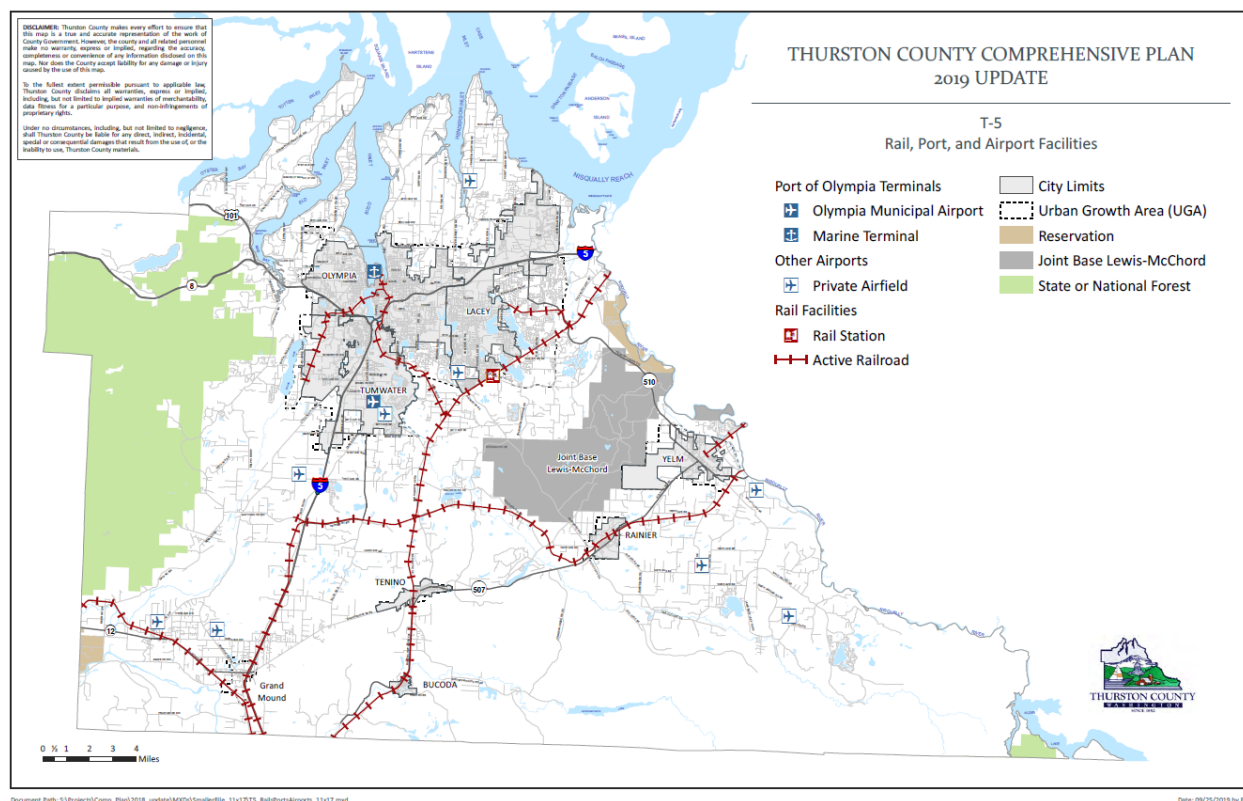
This subsection describes reasonably foreseeable environmental trends and planned actions pertinent to transportation in the study area. The following subsections describe the roadway system, transit and nonmotorized routes, airports, and railroads in the study area, identifying known planned actions in each of those components of the county's transportation network. The County's planned transportation improvement projects are identified in the TCCP. Other reasonably foreseeable trends and planned actions related to transportation are individual County-permitted development activities, County infrastructure activities, and periodic updates to the TCCP. No other planned actions specific to this discipline have been identified. Note these projects may be considered as planned actions in this analysis for NEPA, even if their planning status does not qualify them as planned actions under SEPA.

The Thurston County transportation network is most dense surrounding the urban core area of Olympia, Lacey, and Tumwater and relies heavily on roadways that branch out from this area towards more rural areas in the county. Figure 3.11-1 shows the major transportation elements in Thurston County, including roadways, railroads, airports, and ports (Thurston County 2020e). Rivers and streams in the study area are generally not used for transportation.

3.11.1.1 Roadway System

The Thurston County roadway systems includes a network of federal interstates and highways, state highways, and local routes. In general, roadways within incorporated cities and their associated UGAs experience varying levels of congestion. For the most part, rural roads operate with minimal congestion, though trends in traffic volumes are projected to increase, especially near urban areas (Thurston County 2020e). The majority of traffic congestion in the study area is during peak travel hours (e.g., commuting hours) on federal highways, key urban intersections, and some collector routes that cross multiple jurisdictions (e.g., Yelm Highway).

According to WSDOT (2020b), there are almost 700 miles of Thurston County roads within the Freight and Goods Transportation System, including 100 miles of city-owned roads, 383 miles of county-owned roads, and 210 miles of WSDOT-owned roads.



Source: Thurston County Comprehensive Plan (Thurston County 2020e)

Figure 3.11-1. Rail, Port, and Airport Facilities

Federal Highways

Three federal highways, operated by WSDOT, traverse Thurston County: I-5, US 12, and US 101.

- I-5 bisects the county for approximately 29 miles and travels from Pierce County in the northeast corner to Olympia and then south through Grand Mound towards Lewis County. I-5 is Washington's busiest highway and is the largest north-south freight route corridor in Thurston County.
- US 12 is located in the southwest portion of the county and travels approximately 8 miles between I-5 in Grand Mound and the Thurston-Grays Harbor county line towards Aberdeen. Much of US 12 in the study area traverses habitat for the Yelm pocket gopher.
- US 101 is located in the northwest portion of the county and travels approximately 10 miles between Tumwater and the Thurston-Mason county line towards Shelton. Tumwater is the terminus of US 101, where it joins with I-5. The majority of US 101 in the study area is located west of the Black River and away from listed-species habitat.

State Highways

Four state highways, maintained by WSDOT, traverse Thurston County: SR 8, SR 121, SR 507, and SR 510. All of these roads except SR 8 intersect with areas of habitat for ESA-listed species along parts of their routes.

- SR 8 is located in the northwest portion of the county, west of the Black River, and travels approximately 10 miles between US 101 near Madrona Beach and the Thurston-Grays Harbor county line towards McCleary.

- SR 121 is an approximately 8-mile loop that starts near I-5 milepost 99.3, travels east along 93rd Avenue SE, south along Tilley Road SW through South Union, west along Maytown Road SW through Maytown, and ends near I-5 milepost 95.2.
- SR 507 is located in the southeast portion of the county and travels approximately 25 miles between Yelm and the Thurston-Lewis county line through Rainier, Tenino, and Bucoda.
- SR 510 is located in eastern portion of the county and travels approximately 13 miles between I-5 in Tanglewilde-Thompson Place and SR 507 in Yelm.

County Roads

Thurston County maintains all public roadways not within the incorporated cities of Olympia, Lacey, Tumwater, Bucoda, Rainier, Tenino, and Yelm. For roads within UGAs surrounding these incorporated cities, Thurston County attempts to adopt roadway standards of the applicable jurisdictions, and all other roads are maintained according to rural road standards.

Roadway Improvements

Reasonably foreseeable environmental trends and planned actions in the permit area and during the permit term include the 20-year transportation capital projects listed in Table 3.6 of the HCP (Thurston County 2020f). These projects include construction of new transportation facilities and planned improvements for roads, bridges, nonmotorized facilities, and other road features. Additional projects are likely to occur over the 30-year analysis period for this EIS, but they have not been identified.

Proposed transportation maintenance activities include vegetation maintenance, open drainage maintenance (ditching), enclosed drainage system maintenance, existing guardrail maintenance, sign installation, bridge maintenance, beaver dam management, and watercourse and stream maintenance (Thurston County 2020f).

3.11.1.2 Transit and Nonmotorized Routes

Intercity Transit, managed by the Intercity Transit Authority, is the primary public transit agency in Thurston County. Its service area is approximately 94 square miles and includes the UGAs of Olympia, Lacey, Tumwater, and Yelm (Thurston County 2020e). Intercity Transit operates 20 bus routes and makes connections to other regional transit services including Mason Transit, Grays Harbor Transit, Pierce Transit, Sound Transit, Greyhound, and Amtrak. It also operates a vanpool program and door-to-door services for people with disabilities.

Rural Transit, managed by TRPC, operates routes that serve residents in Rochester, Tenino, Bucoda, Rainier, Yelm, and the Confederated Tribes of the Chehalis Reservation. Rural Transit also connects to Intercity Transit in Tumwater and Twin Transit in Lewis County.

Thurston County nonmotorized routes include on- and off-street bicycle and pedestrian facilities, such as bike lanes, sidewalks, road shoulders, and trails (which are discussed specifically in Section 3.7, Recreation). The nonmotorized transportation network is most dense in the Thurston County urban core but also includes several on-street facilities, such as bicycle lanes, along state highways and other county roads. Planned actions, such as improvements to nonmotorized routes, are generally part of roadway improvements (see Section 3.11.1.1), except in the case of designated shared-use paths.

3.11.1.3 Airports

There are no commercial passenger airports in Thurston County. The closest commercial airports are Seattle-Tacoma International Airport (SeaTac) and Portland International Airport. Olympia Regional

Airport, located in Tumwater and operated by the Port of Olympia, is a public general aviation airport that offers aircraft service and maintenance, flight instruction, hangar storage, and corporate aviation facilities. There are no charter flight services available at Olympia Regional Airport. There are also several private airfields in Thurston County. No planned actions specific to airports have been identified.

3.11.1.4 Railroads

There are approximately 90 miles of active railway in Thurston County, operated by Burlington Northern Santa Fe (BNSF), Puget Sound and Pacific (PSAP) railroad, Union Pacific (UP) railroad, Port of Olympia, and Tacoma Rail. The railroads are primarily used for the transportation of freight and goods. The only passenger train is operated by Amtrak Cascades on the BNSF railroad, which travels in a north-south direction between Tacoma (Pierce County) and Centralia (Lewis County), passing through Lacey, Tenino, and Bucoda. Amtrak has one stop in Thurston County at the Olympia-Lacey Centennial Station located in Lacey. Thurston County does not have jurisdiction over the maintenance of railroad facilities, and railroad maintenance is not identified as a proposed covered activity in the HCP. As such, the alternatives would not differ in their potential impacts on railroads, and railroads are not addressed further in this EIS. No planned actions specific to railroads have been identified.

3.11.2 Environmental Consequences

The County and USFWS have determined that an alternative could have significant adverse impacts on transportation if implementation would lead to development that exceeds, either individually or collectively, regional level-of-service standards established by TRPC for designated roads; substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections); result in inadequate emergency access; or conflict with adopted policies, plans, or programs supporting the region's diverse transportation system. The alternatives may impact transportation through development in response to increased population density, through construction of new infrastructure, and through infrastructure maintenance. This analysis considers the reasonably foreseeable environmental trends and planned actions (collectively described above as the affected environment) together with each alternative in order to assess the environmental effects of the alternatives on transportation.

Under any of the alternatives, all activities described in Chapter 2 (including transportation maintenance and capital projects) would be required to comply with the TCCP (Thurston County 2020e) and subarea plans as well as with capital facilities plans. They would also be subject to all applicable tribal, federal, state, and local laws, regulations, and permitting requirements. These plans, laws, and regulations are designed to ensure that development does not lead to conditions that exceed level-of-service standards, increases design hazards, or impedes emergency access. Under any of the alternatives, Thurston County would continue to comply with all applicable laws, regulations, and environmental review procedures.

As discussed in Chapter 2, the total acreage of development activities would be similar under all alternatives. Over the next 30 years, development of residential-zoned properties is expected to increase from its current level (58 percent of capacity) to approximately 70 percent of capacity, within current zoning allowances. Likewise, implementation of the other activities described in Chapter 2 would be similar under the No Action Alternative and the action alternatives during the same period. As a result, the impacts of those activities on transportation would not differ substantially in the short term or long term.

The activities described in Chapter 2 would continue to occur under all of the alternatives. As such, all alternatives could have the following impacts on transportation:

- Short-term increases in traffic volumes during construction

- Long-term changes in traffic volumes associated with new residential or commercial/industrial development in currently undeveloped areas

The activities described in Chapter 2 would not differ substantially in their impacts on transportation, either in the short term or in the long term, and none of the alternatives would have any significant impacts on transportation in the study area. Under any of the alternatives, all activities conducted, permitted, or authorized by the County (including transportation infrastructure and maintenance projects) would be required to comply with the TCCP (Thurston County 2020e) and subarea plans as well as with the Regional Transportation Plan (TRPC 2020f).

The differences between the alternatives arise primarily from the way in which mitigation for impacts on the proposed covered species would be implemented and managed. Under the action alternatives, implementation of some transportation projects could be expedited because compliance with ESA requirements may be accomplished simply by demonstrating consistency with HCP requirements rather than through take avoidance (i.e., the No Action Alternative) or through future federal actions outside the scope of this analysis (e.g., Section 7 consultations). The following subsections compare the potential impacts of the alternatives.

3.11.2.1 No Action Alternative

Under the No Action Alternative, many transportation maintenance and capital projects would be implemented only if impacts to ESA-listed species can be avoided or are allowed under the 4(d) special rule for *Mazama* pocket gophers. As noted in the HCP, ESA-listed species are known to be present at several sites where the County expects to construct or expand transportation facilities in the next 30 years and may occur at other sites as well. If a proposed transportation project has federal involvement (e.g., funding or permitting), ESA compliance would be accomplished through the Section 7 consultation process. For projects with no federal involvement, the County would bear the responsibility for avoiding violations of the take prohibitions in ESA Section 9. If impacts to ESA-listed species cannot be avoided, the County could prepare project-specific HCPs and seek ITPs, which, as discussed in Section 2.1.1.2, are not considered reasonably foreseeable for analysis in this EIS.

Take avoidance may reduce the scope or delay implementation of some transportation projects, potentially resulting in minor increases in traffic where infrastructure expansion is needed to meet growing transportation demands. In recent years, USFWS has received requests for individual ITPs to cover three transportation infrastructure expansion projects. In addition, USFWS has conducted Section 7 consultation on several similar federal projects. According to the County, approximately five projects are currently being modified or delayed as a result of take avoidance procedures consistent with the No Action Alternative, including safety projects (e.g., bike lanes, sidewalks, intersections) and projects to add capacity for additional traffic due to new development. Without take authorizations, these project deferrals may create or prolong exceedances of regional level-of-service standards. Under the No Action Alternative, some projects identified as planned actions may not occur, may partially occur, or may not occur in a timely manner. This alternative does not provide regulatory certainty for transportation projects that may affect ESA-listed species and could negatively impact projects intended to improve the safety and level-of-service of roads if they are in areas occupied by ESA-listed species. While this is significant with existing trends, the No Action Alternative could have significant adverse impacts on transportation resources.

3.11.2.2 Proposed Action

Under the Proposed Action, County approval of transportation projects would be streamlined in the modeled habitat of covered because ESA compliance would be accomplished simply by demonstrating

consistency with HCP requirements rather than through take avoidance. Transportation-related covered activities would benefit from streamlined project requirements under the HCP. As a result, the necessary transportation improvements and maintenance projects are expected to occur as needed under the Proposed Action. Therefore, this alternative would not be expected to result in significant adverse impacts to transportation resources. Further, the Proposed Action would resolve the significant adverse effects on transportation that are expected to result from take avoidance procedures under the No Action Alternative.

3.11.2.3 Modified HCP Alternative

Impacts associated with the Modified HCP Alternative would be nearly identical to those of the Proposed Action. Under the Modified HCP Alternative, mitigation would occur only on new reserves, but this would not have meaningful differences for covered activities in terms of transportation. Therefore, the Modified HCP Alternative would provide equivalent outcomes for transportation resources as the Proposed Action and would not have significant adverse impacts to transportation resources.

3.11.2.4 Avoidance, Minimization, and Mitigation Measures

In accordance with 40 CFR § 1502.16 and WAC 197-11-440(6)(c)(iii), this analysis considers other appropriate mitigation measures not already included in the proposed action or alternatives to address impacts to transportation. Under existing regulations, summarized in Section 3.11.1, measures related to transportation are managed by local and state agencies working in coordination with federal and municipal governments to ensure federal, state, and local standards for transportation are met. The County routinely addresses transportation as a key factor in strategic planning, comprehensive plans, zoning, CAO, and related codes and regulations. These planning measures are common to all alternatives.

Under the No Action Alternative, conflicts arise when transportation improvement or maintenance projects are delayed or not undertaken due to take avoidance procedures for ESA-listed species. The Proposed Action is the County's proposed approach to mitigate transportation conflicts because the HCP supports improved conservation and regulatory certainty for transportation improvement and maintenance projects in Thurston County jurisdiction.

Take authorization under the action alternatives would support streamlined County approvals for transportation projects in modeled habitat for covered species regardless of species occupancy, which is a major factor limiting the certainty and timing of some transportation improvement projects under the No Action Alternative. In addition, the action alternatives include measures to avoid, minimize and mitigate impacts on covered species resulting from transportation improvements and transportation maintenance projects. Though BMPs detailed in HCP Appendix C may impact siting and configuration, or project footprints, these measures would replace take avoidance measures for covered species and would not adversely affect any transportation projects. The action alternatives would resolve the significant adverse effects on transportation resources that could occur under the No Action Alternative. No additional mitigation measures are included.

Nothing in this EIS is intended to limit the mitigation authorities of other agencies, should additional mitigation responsibilities be identified while planning, permitting, or carrying out individual activities.

3.12 Public Services and Utilities

The study area for public services and utilities includes only lands over which the County has permitting authority – approximately 412,228 acres, or 87 percent of the total county area. This area excludes tribal

lands, lands under state or federal control, and the incorporated cities of Olympia, Lacey, Tumwater, Yelm, Rainier, Tenino, and Bucoda. The study area is relatively expansive because public services and utilities are an interconnected network. As a result, this analysis considers the network of public services and utilities in Thurston County jurisdiction, with attention to site-scale and county-scale outcomes of the alternatives.

Thurston County public services and utilities include water supply; sanitary and storm sewers; solid waste management; police and fire protection; and government offices, libraries, and animal control. Additional facilities identified in the TCCP, such as streets, transit, and nonmotorized routes, are discussed in Chapter 3.11 (Transportation), and public and community parks and trails are discussed in Chapter 3.7 (Recreation).

Information in this section is based on Thurston County's Comprehensive Plan, including updated chapters on Health and Human Services and Capital Facilities (Thurston County 2020e), and the Stormwater Management Plan (Thurston County 2020d).

3.12.1 Affected Environment

This subsection describes reasonably foreseeable environmental trends pertinent to public services in the study area. Aside from individual County-permitted development, County infrastructure activities, utility and public service facility maintenance, and periodic updates to the TCCP, consistent with reasonably foreseeable environmental trends, no other planned actions specific to this environment discipline have been identified.

In the study area, the levels of public services and utilities vary. The highest levels of public services and facilities are provided in UGAs and, to a lesser extent, in smaller towns. Several rural land uses do not require provision of public services, such as water supply and sewer systems, because they are too far from urban areas to be cost-effective, or extension of facilities is contingent upon inclusion within a UGA. Approximately 20 percent of the county area is within the incorporated cities of Olympia, Lacey, Tumwater, Bucoda, Rainier, Tenino, and Yelm and their surrounding UGAs. According to 2017 population estimates, 69 percent of the county population is located within these same areas, and by 2040 it is projected to be 74 percent (Thurston County 2020e). The following sections describe the utilities and other public services managed by Thurston County.

3.12.1.1 Utilities

Thurston County owns and operates solid waste, stormwater, water, and sewer utilities within the county. Private utilities provide electricity, natural gas, cable, and telephone services.

Solid Waste

The Thurston County Solid Waste Management Plan (SWMP) outlines solid waste management services in coordination with the incorporated cities within the county. Services include waste reduction, collection, handling, recycling, and disposal. Waste collection from residences and businesses is provided by private collection companies, and Thurston County is responsible for waste transfer and disposal. Thurston County Public Works Solid Waste Division manages the Waste and Recovery Center which includes a closed landfill, a moderate-risk waste collection facility, and a contractor-operated transfer station for residential trash, yard waste, and recyclable materials (Thurston County 2020e). There are also smaller drop-box facilities located in Rainier and Rochester. Solid waste collected from all Thurston County facilities is transferred to landfills located outside of the County.

Reasonably foreseeable environmental trends and planned actions that would occur in the study area include the following:

- Construction of one small solid waste facility and one large facility, although the exact locations of these planned facilities are not known yet.
- Expansion of two existing recycling centers.
- Solid waste cleanup and remediation of 12 sites, each totaling 5,000 square feet. (Thurston County 2020f).

Stormwater

The Thurston County Stormwater Utility was expanded in 2008 to include all portions of unincorporated Thurston County and is responsible for flood reduction, erosion prevention, and pollution control in rainwater runoff in compliance with federal and state water regulations (Thurston County 2019a). According to the Comprehensive Plan, Thurston County has an inventory of the 103 miles of pipe systems, nearly 6,290 catch basins, 3,246 culverts, and 26,765 pipes, ditches, and swales. Additionally, the County maintains a drainage inventory of 77 County-owned and/or operated stormwater facilities and 991 privately owned residential or commercial facilities.

To meet level-of-service standards and address the impacts of development, the County has proposed and prioritized capital improvement program projects for stormwater facilities. The proposed capital improvement program projects for the 2021 to 2026 planning period are categorized as flood control, water quality facility, or riparian restoration projects (Thurston County 2020f). These projects are within previously developed areas served by the stormwater utility that have inadequate or failing existing facilities, which are causing flooding or other water quality issues (Thurston County 2020e).

Ecology has issued an NPDES municipal stormwater permit to Thurston County, which requires the County to develop, implement, and update a Stormwater Management Program Plan (Stormwater Plan). The permit covers the UGAs of Olympia, Lacey, and Tumwater, and federally designated unincorporated urbanized areas, which are the densely populated residential areas surrounding Olympia, Lacey, and Tumwater. In order to comply with Ecology's 2019 NPDES permit requirements, Thurston County is required implement a stormwater planning program, which now includes Stormwater Management Action Planning. By March 2022, the County is required to assess receiving water conditions and prioritize subbasin areas for stormwater infrastructure investments throughout the permit area. By March 2023, the County is required to develop a Stormwater Management Action Plan for at least one high-priority catchment area that identifies stormwater retrofit needs, including locations and types of stormwater BMPs, and land management and development strategies for water quality management.

Water and Sewer

The County owns and operates three water systems (Boston Harbor, Grand Mound, and Tamoshan), five rural sewer systems (Grand Mound, Boston Harbor, Tamoshan/Beverly Beach, and Olympic View), and one sewer line system (Woodland Creek Sanitary Sewer) in the Lacey UGA (Thurston County 2019a). Thurston County supplies drinking water to approximately 800 county residents and operates three wastewater treatment facilities. As part of the county improvement plan, the County has proposed several projects to address the growing demands for water and sewer services in Boston Harbor, Grand Mound, and Tamoshan (Thurston County 2020f).

Municipal wastewater services in Thurston County are provided by the LOTT Clean Water Alliance, which is a nonprofit corporation consisting of four government partners including the County and the cities of Lacey, Olympia, and Tumwater. LOTT treats the wastewater from residences and businesses in

the UGAs for the cities listed above. The service area is approximately 52,300 acres including an estimated residential population of 175,500 and employment population of 115,200 (LOTT 2020a). The LOTT system includes the Budd Inlet Treatment Plant, Budd Inlet Reclaimed Water Plant, Martin Way Reclaimed Water Plant, Hawks Prairie Reclaimed Water Ponds and Recharge Basin, three major pump stations, 22 miles of sewer interceptor lines, and 11 miles of reclaimed water pipelines (LOTT 2020b). Based on TRPC populations growth projections, LOTT anticipates expanding capacity at multiple facilities within their system to meet growing service demands (LOTT 2020a).

Other than the previously mentioned systems, the County does not provide municipal water and/or sewer services to rural areas. Residents without public services for water or sewer use private or community wells and septic systems, subject to permits by Thurston County.

Based on growth projections, reasonably foreseeable trends include placement of approximately 4,300 septic system extensions (i.e., installation of septic systems outside the development envelope of associated structures) and repair/alteration of approximately 6,200 existing septic systems over the next 30 years (Thurston County 2020e). The County also expects to construct new water treatment systems and reservoirs and install new groundwater wells. Other potential projects include water conveyance, flow, runoff, treatment, and retention facilities.

Private Utilities

Private utilities are available to most residents in Thurston County, including electricity and natural gas, cable, and telephone (standard and cellular). Some County residents furnish their own utility services through solar panels or by maintaining on-site heating oil or propane tanks.

Reasonably foreseeable trends include the removal of approximately 150 heating oil tanks in the permit area, and the extension of these utilities, as needed for County-permitted residential, commercial, or other construction (Thurston County 2020f).

In Thurston County, Puget Sound Energy was issued an ITP to cover the limited take of three threatened subspecies of *Mazama* pocket gopher resulting from the replacement, repair, and upgrade of existing utility systems within the County. Reasonably foreseeable planned actions related to implementing the Puget Sound Energy HCP include the ongoing maintenance of electric and natural gas utilities in Thurston County.

3.12.1.2 Public Services

The following sections describe public services in Thurston County, including emergency services (fire and police) and education.

Emergency Services

The Thurston County Fire Marshal Office serves the entire area of unincorporated Thurston County. The county is divided into 15 fire districts.

The Thurston County Sheriff's Office serves all of unincorporated Thurston County as well as the cities of Bucoda and Rainer. The County sheriff's office has five response districts that divide the county into geographic regions: Adam (northwest), Boy (northeast), Charles (central), David (southwest), and Edward (southeast).

Reasonably foreseeable planned actions for emergency services include construction of approximately 10 new rural fire stations within the permit area, though specific locations are not yet known (Thurston County 2020f).

Education

There are nine school districts within Thurston County: Griffin School District, North Thurston Public Schools, Olympia School District, Rainier School District, Rochester School District, Tenino School District, Tumwater School District, and Yelm School District. There are currently eight public school campuses within county jurisdiction, and most are on sites that are 10 to 20 acres in size. The exception is the Rochester School District campus, which is 77 acres.

According to the TRPC What Moves You Transportation Plan, grade school enrollment is expected to increase by 81 percent between 2019 and 2045 (TRPC 2020f). Reasonably foreseeable planned actions for educational facilities include the expansion of the Rochester primary through high school complex; refurbishment of Littlerock Elementary and East Olympia Elementary; and construction of new schools in the Tumwater UGA and Rochester District (Thurston County 2020f).

3.12.2 Environmental Consequences

The County and USFWS have determined that an alternative could have significant adverse impacts on public services and utilities if undertaking covered activities would result in development that exceeds the County's capacity to provide these services. This analysis considers the reasonably foreseeable environmental trends and planned actions (collectively described above as the affected environment) together with each alternative in order to assess the environmental effects of the alternatives on public services and utilities.

Under any of the alternatives, all activities described in Chapter 2 (including public service facility construction) would be required to comply with the TCCP (2019a) and subarea plans as well as with capital facilities plans (e.g., for school districts and fire districts). They would also be subject to all applicable tribal, federal, state, and local laws, regulations, and permitting requirements. These plans, laws, and regulations are designed to ensure development is consistent with the County's capacity to provide public services and utilities. As a result, none of the alternatives are expected to result in significant adverse impacts on public services and utilities. However, outcomes for public services and utilities would vary in some locations between the No Action Alternative and the action alternatives.

Residential development and the other activities described in Chapter 2 would continue to occur under all of the alternatives, though some project locations may vary. New residential, commercial, and industrial development in currently undeveloped areas would increase the demand for public services and utilities. Existing plans and their anticipated updates are expected to ensure that future demand continues to be aligned with the availability of public services and utilities. The locations of some projects would differ based on take avoidance under the No Action Alternative and take authorization under the action alternatives, where individuals of listed species are present.

As discussed in Chapter 2, the total amount of development activities would be similar under all alternatives, although locations of individual projects may vary. Over the next 30 years, development of residential-zoned properties in County jurisdiction is expected to increase from its current level (58 percent of capacity) to approximately 70 percent of capacity, within current zoning allowances. Likewise, during the same period, implementation of the other activities described in Chapter 2 would be similar under the No Action Alternative and the action alternatives at a countywide scale but may vary on a site-specific basis. As a result, none of the alternatives would have significant adverse impacts on public services and utilities at the countywide scale, but project locations would differ substantially under the No Action Alternative compared to the action alternatives, because projects in modeled habitat for covered species would not be implemented under the No Action Alternative.

Under the action alternatives, installation and maintenance of all utilities and public service facilities permitted by the County, along with some capital facility improvement projects, could be expedited under the HCP and would benefit from improved planning certainty with regard to covered species. The following subsections compare the potential impacts of the alternatives.

3.12.2.1 No Action Alternative

Under the No Action Alternative, individual projects that occur in modeled habitat for ESA-listed species would be screened for species occupancy, and projects that would avoid impacts to ESA-listed species would proceed. As noted in the HCP, ESA-listed species are known to be present at several sites where the County expects to construct or expand public facilities in the next 30 years; ESA compliance issues are likely to arise at other sites, as well. Where there is a need for species occupancy review, there would be a slight delay in project completion, even if no ESA species are detected. Where take is unavoidable, local, short-term public service levels could be negatively impacted. Existing electric and gas services would likely be maintained during the term of PSE's ITP, which covers replacement, repair, and upgrade of existing service lines.

Extension of public services to new developments would be considered in land use planning, as described in Section 3.6; therefore, most new construction occurring under this alternative would likely be able to install appropriate utilities to meet their utility demands because the projects would be sited in areas where take of ESA-listed species can be avoided. As a result, most residents in Thurston County would have reliable access to utility services.

The take avoidance approach is not compatible with foreseeable utility and public service facility needs where impacts to ESA-listed species cannot be avoided. This alternative could prevent utility extension, installation, or repair, as well as construction of new/expanded public service facilities in certain locations. As a result, the No Action Alternative would result in the loss of options for utilities or public services at some individual locations occupied by residents of Thurston County and thus likely considered significant and adverse for the entire community.

As a result, the biggest differences among alternatives would be the site-specific locations of new construction. Without a countywide ITP, extension of public services would occur only where unauthorized take of ESA-listed species can be avoided. Where take cannot be avoided, some individual projects may not occur or may be delayed under the No Action Alternative due to take avoidance procedures.

3.12.2.2 Proposed Action

Under the Proposed Action, implementation of County-owned public facility projects would be expedited for covered activities with the potential to impact covered species because ESA compliance would be accomplished through the HCP. Covered activities such as septic repair and/or extension, landfill and solid waste management, water resources management, and public service facility construction would also benefit from expedited permitting. These projects would occur wherever needed, subject to County permitting criteria, providing increased certainty that the public services and utilities necessary to fulfill the County's responsibilities to the public would be supported. As a result, the Proposed Action would resolve a significant conflict expected to result from the No Action Alternative by improving access and reliability of utilities and public service facilities located in the modeled habitat for covered species. Therefore, the Proposed Action is expected to significantly benefit this resource.

3.12.2.3 Modified HCP Alternative

Impacts on public services and utilities resulting from the Modified HCP Alternative would be identical to those of the Proposed Action. Under the Modified HCP Alternative, mitigation would occur only in new reserves, but this would not result in meaningful differences among action alternatives for public services and utilities. Therefore, the Modified HCP would significantly benefit this resource.

3.12.2.4 Avoidance, Minimization, and Mitigation Measures

In accordance with 40 CFR § 1502.16 and WAC 197-11-440(6)(c)(iii), this analysis considers other appropriate mitigation measures not already included in the proposed action or alternatives to address impacts to public services and utilities, summarized in Section 3.12.1.

Under any of the alternatives, Thurston County would continue to have authority to mitigate impacts of land use conversion on public services through impact fees. In addition, the Thurston County CAO conditions development in certain areas. No other mitigation authorities related to impacts on public services have been identified.

Under the action alternatives, BMPs applicable to public service facility construction are described in Appendix C of the HCP and would be implemented to the maximum extent practicable. HCP Appendix C includes multiple measures to minimize impacts through project siting and configuration, in addition to guidelines for procedures during construction and maintenance of facility grounds (e.g., invasive species control) that can minimize impacts to the covered species.

Under existing regulations, mitigation measures related to public services and utilities are indirectly authorized through requirements for compliance with SWMP, LOTT Clean Water Alliance agreements, Washington Utility and Transportation Commission standards, and other measures, which are common to all alternatives. As described above, the action alternatives would not result in significant adverse effects on public services and utilities. No additional avoidance or mitigation measures are included in the action alternatives. Nothing in this EIS is intended to limit the mitigation authorities of other agencies, should additional mitigation responsibilities be identified while planning, permitting, or carrying out individual activities.

Appendix A

Literature Cited



APPENDIX A. LITERATURE CITED

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All material substantiating analysis fundamental to the impact statement and all material relevant to the decision to be made are cited here, per 40 CFR § 1502.19.

Appendix B

List of Preparers



APPENDIX B. LIST OF PREPARERS

Staff from Thurston County and the USFWS Western Washington Field office led the development of this EIS, with support from a team of consultants led by Confluence Environmental. The following professionals contributed to the preparation of this document.

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Appendix C

Effects Mechanisms Tables



APPENDIX C. EFFECTS MECHANISMS TABLES

This appendix contains summary tables describing the effect mechanisms, covered activities, descriptions of effects, and their interactions with the best management practices (BMPs) that may limit impacts to protected species or habitats from covered activities within the Thurston County HCP EIS. These tables are presented by resource, in order of presentation within Chapter 3 of the EIS.

The symbology within the following effect mechanisms tables is defined as follows:

Symbol	Definition
n/a	BMP does not interact with effect mechanism in meaningful way
*	discountable effect on resource from BMP implementation
-	potential negative effect on resource from BMP implementation
+	Potential positive effect on resource from BMP implementation

Table C-1. Soils and Geology Resource Effect Mechanisms, Related Covered Activities, Description of Effects, and Potentially Mitigating Best Management Practices

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
Surface soil compaction from grading and heavy equipment increases runoff and can result in erosion and sediment movement from cleared and disturbed areas	Residential Development and Added Accessory Structures	Development of new residential, commercial, and industrial areas, public facilities, and transportation infrastructure typically decreases surface soil permeability by compacting native soil and/or overlaying with pavement or buildings. <ul style="list-style-type: none"> Permanent impacts to soil hydrologic functions Slower or lower infiltration rates Increased runoff in rainy season Increased erosion and sediment movement 	+	*	+	+	+	*	*
	Commercial/Industrial Development		+	*	+	+	+	*	*
	Public Service Facilities		+	*	+	+	+	*	*
	Transportation Capital Projects		+	*	+	+	+	*	*
	Landfill/Solid Waste Management		+	*	+	+	+	*	*
	Septic Installation, Repair, Extension; Underground Storage Tank Removal	Affects relatively small areas. Activity initially disturbs soil surface; long-term impacts to infiltration are minimal as surface of disturbed area is typically vegetated and permeable.	*	*	*	+	+	*	*
	Transportation Maintenance Projects	Minor surface compaction from mowing equipment; possible microbial impacts affecting soil structure from use of pesticides, herbicide, and fumigants.	+	*	*	+	+	*	*
	Water Resource Management	Stormwater systems in developed areas are designed to capture and infiltrate sediment-laden stormwater runoff, reducing adverse effects of increased erosion and sediment movement from development activities (described above).	+	*	+	+	+	*	*

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
	Parks, Trails, and Rec. Lands Management	In areas that are dominated by surface vegetation rather than impervious surfaces, small-scale trail projects and continued maintenance of existing infrastructure will have minimal impact on overall long-term infiltration function in recreational lands. During construction, there may be short-term increases in erosion and sediment movement.	+	*	*	+	+	+	*
Plowing, deep-tilling, herbicide use, pesticide application and fumigation disrupt soil physical and biochemical functions	Public Service Facilities	<ul style="list-style-type: none"> Plowing and deep tilling disrupts soil structure and soil animal, insect, and microbial processes. Increases rate of soil organic matter decomposition, which affects physical and biological processes. 	+	*	*	+	+	+	+
	Transportation Capital Projects		+	*	*	+	+	+	+
	Landfill/Solid Waste Management	<ul style="list-style-type: none"> Fumigation may have inadvertent impacts on soil mycorrhizae, which are a critical component of the prairie plant community support ecosystem. 	+	*	+	+	+	+	+
	Septic Installation, Repair, Extension; Underground Storage Tank Removal	Initial soil disturbance is temporary; pesticide, herbicide and fumigant use is typically minimal. Long term impact introduces a new nutrient source to subsoils and slightly changes local microbial populations.	*	+	+	+	+	+	+
	Transportation Maintenance Projects	Use of herbicides, pesticides and fumigants impacts soil microbial populations associated with plant growth and decomposition, but across the greater	+	*	+	+	+	+	+

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
		landscape is assumed to be an insignificant impact on soil functions.							
	Water Resource Management	Stormwater facility management seldom involves regular use of pesticides, herbicides, or fumigants. Assumed to be an insignificant impact on soil functions.	+	+	+	+	+	+	+
	Parks, Trails, and Rec. Lands Management	Plowing and deep tilling is typically minimal. Use of pesticides, herbicides and fumigants in parks can be significant, but is typically limited to trail management. Assumed to be an insignificant impact on soil functions.	+	*	*	+	+	+	+
Grading and plowing results in loss of prairie topsoil which contains nutrients and native plant seed repositories needed to maintain prairie plant communities.	Residential Development and Added Accessory Structures	Grading for that removes topsoil in any of the Covered activities may lead to loss of prairie seed source and prairie habitat regrowth. <ul style="list-style-type: none"> Removes topsoil which contains nutrients and native plant seeds. 	+	+	+	+	*	+	*
	Commercial/Industrial Development		+	+	+	+	*	+	*
	Public Service Facilities		+	+	+	+	*	+	*
	Transportation Capital Projects		+	+	+	+	*	+	*
	Landfill/Solid Waste Management		+	+	+	+	*	+	*
	Septic Installation, Repair, Extension; Underground Storage Tank Removal		+	+	+	+	*	+	*
	Transportation Maintenance Projects		+	+	+	+	*	+	*

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
	Water Resource Management		+	+	+	+	*	+	*
	Parks, Trails, and Rec. Lands Management		+	+	+	+	*	+	*

Table C-2. Air Quality and Climate Change: Effect Mechanisms, Related Covered Activities, Description of Effects, and Potentially Mitigating Best Management Practices

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
Temporary changes in air quality during construction of proposed covered activities.	Residential Development	Construction of new residential and commercial/industrial areas, public facilities, and transportation infrastructure may lead to minor, short-term increases in local concentrations of fugitive dust and suspended particulate matter.	n/a	n/a	n/a	+	+	*	*
	Commercial/Industrial Development		n/a	n/a	n/a	+	+	*	*
	Public Service Facilities		n/a	n/a	n/a	+	+	*	*
	Transportation Capital Projects		n/a	n/a	n/a	+	+	*	*
	Landfill/Solid Waste Management		n/a	n/a	n/a	+	+	*	*
	Added Accessory Structures	Construction of small-scale projects and continued maintenance of existing infrastructure lead to very minor, short-term increases in local concentrations of fugitive dust and suspended particulate matter.	n/a	n/a	n/a	+	+	*	*
	Septic Installation, Repair, Extension; Underground Storage Tank Removal		n/a	n/a	n/a	+	+	*	*
	Transportation Maintenance Projects		n/a	n/a	n/a	+	+	*	*
	Water Resource Management		n/a	n/a	n/a	+	+	*	*
	Parks, Trails, and Rec. Lands Management		n/a	n/a	n/a	+	+	*	*

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
Long-term changes in greenhouse gas emissions due to increased vehicular traffic associated with urban growth.	Residential Development	Development of new residential and commercial/industrial areas, public facilities, and transportation infrastructure may lead to increased greenhouse gas emissions.	n/a	n/a	n/a	*	*	*	*
	Commercial/Industrial Development		n/a	n/a	n/a	*	*	*	*
	Public Service Facilities		n/a	n/a	n/a	*	*	*	*
	Transportation Capital Projects		n/a	n/a	n/a	*	*	*	*
	Landfill/Solid Waste Management		n/a	n/a	n/a	*	*	*	*
	Added Accessory Structures	Unlikely to affect greenhouse gas emissions.	n/a	n/a	n/a	*	*	*	*
	Septic Installation, Repair, Extension; Underground Storage Tank Removal		n/a	n/a	n/a	*	*	*	*
	Transportation Maintenance Projects		n/a	n/a	n/a	*	*	*	*
	Water Resource Management		n/a	n/a	n/a	*	*	*	*
	Parks, Trails, and Rec. Lands Management		n/a	n/a	n/a	*	*	*	*

Table C-3. Water Resource Effect Mechanisms, Related Covered Activities, Description of Effects, and Potentially Mitigating Best Management Practices

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
Increased runoff and pollutant loading from impervious surfaces	Residential Development	new residential, commercial, and industrial areas, public facilities, and transportation infrastructure typically increases watershed impervious area. Increased impervious area: <ul style="list-style-type: none"> Alters basin hydrology, contributing to increased runoff rates in winter, reduced groundwater recharge, and lower baseflows in summer. 	+	+	n/a	+	+	*	*
	Commercial/Industrial Development		+	+	n/a	+	+	*	*
	Public Service Facilities		+	+	n/a	+	+	*	*
	Transportation Capital Projects		+	+	n/a	+	+	*	*
	Landfill/Solid Waste Management	<ul style="list-style-type: none"> Elevated runoff rates increase the delivery of toxic contaminants, nutrients, and fine sediments to wetlands, streams, and the marine environment. 	+	+	n/a	+	+	*	*
	Added Accessory Structures	Accessory structures marginally increase impervious area in residential developments, contributing to effects described above.	n/a	+	n/a	+	+	*	*
	Septic Installation, Repair, Extension; Underground Storage Tank Removal	Activity reduces/removes potential sources of nutrients and toxic pollutants	n/a	*	n/a	*	*	*	*
	Transportation Maintenance Projects	Activity maintains and improves existing transportation stormwater management infrastructure, limiting pollutant loading to surface waters.	+	n/a	n/a	*	*	n/a	n/a

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
	Water Resource Management	Activity includes stormwater system improvements designed to capture and infiltrate stormwater, reducing adverse effects on stream and wetland hydrology and limiting delivery of pollutants to surface waters.	+	*	*	+	+	*	*
	Parks, Trails, and Rec. Lands Management	Activity maintains existing impervious surfaces and drainage infrastructure and has minimal effect on watershed impervious area.	*	*	*	+	+	*	*
Loss of forest cover, leading to reduced shade, flood storage, pollutant filtration, and organic inputs.	Residential Development	Development of new residential and commercial/industrial areas, new public facilities, and transportation infrastructure may lead to loss of forest cover. Loss of forest cover: <ul style="list-style-type: none"> Limits ability of riparian areas to store floodwaters and reduces inputs of insects, woody debris, and coarse organic material to aquatic ecosystems, negatively affecting physical and biological processes. 	*	*	*	+	+	+	+
	Commercial/Industrial Development		*	*	*	+	+	+	+
	Public Service Facilities		*	*	*	+	+	+	+
	Transportation Capital Projects		*	*	*	+	+	+	+
	Landfill/Solid Waste Management	<ul style="list-style-type: none"> Reduces shading and microclimate conditions, negatively impacting water temperatures. Reduces the capacity of upland and riparian vegetation to filter toxic contaminants, nutrients, and fine sediments from stormwater, 	*	*	*	+	+	+	+

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
		increasing pollutant delivery to wetlands, streams, and the marine environment.							
	Added Accessory Structures	Added accessory structures may marginally increase loss of forest cover associated with residential and commercial/industrial development at the basin scale, contributing to the effects described above.	*	*	*	+	+	+	+
	Septic Installation, Repair, Extension; Underground Storage Tank Removal	Unlikely to significantly affect forest cover at the basin scale.	n/a	n/a	n/a	*	*	*	*
	Transportation Maintenance		+	n/a	n/a	*	*	*	*
	Water Resource Management		*	n/a	n/a	*	*	*	*
	Parks, Trails, and Rec. Lands Management		n/a	n/a	n/a	*	*	n/a	n/a
Loss of intact prairie habitat, leading to reduced flood storage, pollutant filtration, and organic inputs.	Residential Development	Development of new residential and commercial/industrial areas, new public facilities, and transportation infrastructure may lead to loss of intact prairie habitat. Conversion of prairie habitat to impervious surfaces: <ul style="list-style-type: none"> Reduces inputs of insects, woody debris, and coarse organic material to aquatic ecosystems, 	*	*	*	+	+	+	+
	Commercial/Industrial Development		*	*	*	+	+	+	+
	Public Service Facilities		*	*	*	+	+	+	+
	Transportation Capital Projects		*	*	*	+	+	+	+
	Landfill/Solid Waste Management		*	*	*	+	+	+	+

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
	Added Accessory Structures	negatively affecting physical and biological processes. <ul style="list-style-type: none"> Removes upland and riparian vegetation that filters toxic contaminants, nutrients, and fine sediments from stormwater, increasing pollutant delivery to wetlands, streams, and the marine environment. 	*	*	*	+	+	+	+
	Septic Installation, Repair, Extension; Underground Storage Tank Removal	Unlikely to significantly affect intact prairie cover at the basin scale.	n/a	n/a	n/a	*	*	*	*
	Transportation Maintenance Projects		+	n/a	n/a	*	*	*	*
	Water Resource Management		*	n/a	n/a	*	*	*	*
	Parks, Trails, and Rec. Lands Management		n/a	n/a	n/a	*	*	n/a	n/a

Table C-4. Plants and Animals Effect Mechanisms, Related Covered Activities, Description of Effects, and Potentially Mitigating Best Management Practices

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
Non-native/invasive species introduction and/or spread	Residential Development	Covered activities can result in import and spread of invasive species with the following effects: <ul style="list-style-type: none"> Native species displacement Native habitat loss Habitat diversity reduction or loss Functional community changes Soil anchoring species loss resulting in erosion and sedimentation Wetland or riparian function alteration Threat to human health 	n/a	+	*	+	+	+	+
	Added Accessory Structures		n/a	+	*	+	+	+	+
	Septic Installation, Repair, Extension; Underground Storage Tank Removal		n/a	+	*	+	+	+	+
	Commercial/Industrial Development		n/a	+	*	+	+	+	+
	Public Service Facilities		n/a	+	*	+	+	+	+
	Transportation Capital Projects		n/a	+	*	+	+	+	+
	Water Resource Management		n/a	+	*	+	+	+	+
	Parks, Trails, and Rec. Lands Management		n/a	+	*	+	+	+	+
	Transportation Maintenance Projects	Activity can mobilize invasive plant and animal species in terrestrial and aquatic environments	*	n/a	n/a	+	+	+	+
	Landfill/Solid Waste Management	Activity increases potential for movement of invasive species over the long term through importation of material and material/wind interaction	n/a	n/a	n/a	+	+	+	n/a

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
Loss of species diversity	Residential Development	Covered activities lead to changes in species assemblages such that:	n/a	*	*	+	+	+	+
	Added Accessory Structures	<ul style="list-style-type: none"> Changes in nutrient loading and availability constrain productivity, composition, and diversity of terrestrial ecosystems 	n/a	*	*	+	+	+	+
	Commercial/Industrial Development		n/a	*	*	+	+	+	+
	Public Service Facilities	<ul style="list-style-type: none"> Abundance in both terrestrial and aquatic ecosystems is limited by the densities and species of pathogens and predators; populations become isolated, diversity decreases, population decreases 	n/a	*	*	+	+	+	+
	Transportation Capital Projects		n/a	*	*	+	+	+	+
	Landfill/Solid Waste Management		n/a	*	*	+	+	+	+
	Water Resource Management	<ul style="list-style-type: none"> Physical disturbances and temporal variation limit terrestrial, freshwater, and marine plant and animal communities 	n/a	*	*	+	+	+	+
	Septic Installation, Repair, Extension; Underground Storage Tank Removal	Unlikely to result in impacts greater than those associated with primary land use.	*	*	*	*	*	*	*
	Transportation Maintenance	Yearly work unlikely to result in impacts greater than those associated with existing roadways. Work programmed for 30 years could result in impacts described for development activities.	+	*	*	+	+	+	+
	Parks, Trails, and Rec. Lands Management	Ongoing trail maintenance and in-park development unlikely to result in plant/animal community or compositional changes. Expansion of park facilities would	*	*	*	+	+	+	+

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
		result in impacts described for development activities.							
Habitat fragmentation	Residential Development	Covered activities lead to wildlife corridor removal or reduction of existing habitat to patches of habitat with other major effects: <ul style="list-style-type: none"> Elimination of connections between habitat areas Isolation of interdependent species Effects on genetic health through reduction in species' ability to withstand stress 	n/a	*	*	+	+	+	+
	Added Accessory Structures		n/a	*	*	+	+	+	+
	Commercial/Industrial Development		n/a	*	*	+	+	+	+
	Public Service Facilities		n/a	*	*	+	+	+	+
	Transportation Capital Projects		n/a	*	*	+	+	+	+
	Landfill/Solid Waste Management		n/a	*	*	+	+	+	+
	Water Resource Management		n/a	*	*	+	+	+	+
	Parks, Trails, and Rec. Lands Management		n/a	*	*	+	+	+	+
	Septic Installation, Repair, Extension; Underground Storage Tank Removal	Unlikely to result in new habitat fragmentation or corridor interruption.	*	*	*	*	*	*	*
	Transportation Maintenance Projects		+	*	*	+	+	+	+

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
Wetland or stream alteration	Residential Development	Covered activities could alter streams, wetlands, aquatic habitat such that habitat and water management functions are reduced or eliminated, such as:	n/a	*	*	*	+	*	+
	Added Accessory Structures		n/a	*	*	*	+	*	+
	Commercial/Industrial Development		n/a	*	*	*	+	*	+
	Public Service Facilities		n/a	*	*	*	+	*	+
	Transportation Capital Projects		n/a	*	*	*	+	*	+
	Landfill/Solid Waste Management	<ul style="list-style-type: none"> Sediment entrapment Floodwater retention Shoreline stabilization Streamflow maintenance Water filtration Groundwater maintenance. <p>Functions are replaced under existing CAO rules, but may not be effective after completion of monitoring periods. Functional effects could also:</p> <ul style="list-style-type: none"> Alter flows or introduce nutrients or pollutants such that wetland or riparian vegetation is inundated, and habitat is compromised Alter wetland hydroperiods such that species assemblage is compromised Alter flows such that life history periods for aquatic species are affected 	n/a	*	*	*	+	*	+
	Water Resource Management	Activities that typically include facility repair and replacement would be unlikely to affect wetlands and aquatic habitats. Water treatment wetlands created. Extension or development of new facilities could result in impacts described for development.	n/a	n/a	n/a	+	+	+	+

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
	Septic Installation, Repair, Extension; Underground Storage Tank Removal	Septic repair would be unlikely to affect wetlands and aquatic habitats. Placement of septic system outside of building envelopes would be unlikely to be approved in wetland soils.	n/a	*	*	*	+	*	+
	Transportation Maintenance Projects	Yearly maintenance unlikely to affect wetlands/aquatic habitats or wetland mitigation projects. Programmed 30-year improvements could affect wetlands/aquatic habitats that have developed over time.	+	*	*	+	+	+	+
	Parks, Trails, and Rec. Lands Management	Trail extensions could potentially affect wetlands, with similar impacts to those described for development.	n/a	*	*	+	*	+	+
Prairie and other terrestrial habitat alteration/loss	Residential Development	Covered activities will remove or permanently alter existing prairie habitat, as well as unique habitats within prairie/wetland/coniferous forest associations.	n/a	*	*	+	*	+	*
	Added Accessory Structures		n/a	*	*	+	*	+	*
	Commercial/Industrial Development		n/a	*	*	+	*	+	*
	Public Service Facilities		n/a	*	*	+	*	+	*
	Septic Installation, Repair, Extension; Underground Storage Tank Removal		n/a	*	*	+	*	+	*
	Transportation Capital Projects		n/a	*	*	+	*	+	*
	Landfill/Solid Waste Management		n/a	*	*	+	*	+	*
	Parks, Trails, and Rec. Lands Management		n/a	*	*	+	*	+	*

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
	Water Resource Management		n/a	*	*	+	*	+	*
	Transportation Maintenance Projects	Unlikely to remove or alter prairie habitat.	+	*	*	+	+	+	+

Table C-5. Noise Effect Mechanisms, Related Covered Activities, Description of Effects, and Potentially Mitigating Best Management Practices

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
Equipment noise during construction of proposed covered activities.	Residential Development	Temporarily increases in noise levels during construction of new residential and commercial/industrial areas, public facilities, and transportation infrastructure.	n/a	n/a	n/a	+	+	*	*
	Commercial/Industrial Development		n/a	n/a	n/a	+	+	*	*
	Public Service Facilities		n/a	n/a	n/a	+	+	*	*
	Transportation Capital Projects		n/a	n/a	n/a	+	+	*	*
	Landfill/Solid Waste Management		n/a	n/a	n/a	+	+	*	*
	Added Accessory Structures	Very minor, temporarily increases in noise levels during construction of new residential and commercial/industrial areas, public facilities, and transportation infrastructure.	n/a	n/a	n/a	+	+	*	*
	Septic Installation, Repair, Extension; Underground Storage Tank Removal		n/a	n/a	n/a	+	+	*	*
	Transportation Maintenance Projects		n/a	n/a	n/a	+	+	*	*
	Water Resource Management		n/a	n/a	n/a	+	+	*	*
	Parks, Trails, and Rec. Lands Management		n/a	n/a	n/a	+	+	*	*

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
Long-term changes in noise levels due to increased vehicular traffic and other activities in areas where development contributes to increased levels of human activity.	Residential Development	Development of new residential and commercial/industrial areas, public facilities, and transportation infrastructure may lead to increased noise associated with vehicle traffic and human activity.	n/a	n/a	n/a	+	+	*	*
	Commercial/Industrial Development		n/a	n/a	n/a	+	+	*	*
	Public Service Facilities		n/a	n/a	n/a	+	+	*	*
	Transportation Capital Projects		n/a	n/a	n/a	+	+	*	*
	Landfill/Solid Waste Management		n/a	n/a	n/a	+	+	*	*
	Added Accessory Structures	Unlikely to significantly affect long-term noise levels.	n/a	n/a	n/a	*	*	*	*
	Septic Installation, Repair, Extension; Underground Storage Tank Removal		n/a	n/a	n/a	*	*	*	*
	Transportation Maintenance Projects		n/a	n/a	n/a	*	*	*	*
	Water Resource Management		n/a	n/a	n/a	*	*	*	*
	Parks, Trails, and Rec. Lands Management		n/a	n/a	n/a	*	*	*	*

Table C-6. Land Use Effect Mechanisms, Related Covered Activities, Description of Effects, and Potentially Mitigating Best Management Practices

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
Land use compatibility	Residential Development	Covered activities could result in development that is in conflict with the existing mosaic of area land uses or projected projects envisioned under covered activities may not be complementary in use or scale to either existing uses or the projected pattern of development.	*	*	*	+	+	+	+
	Added Accessory Structures		*	*	*	+	+	+	+
	Commercial/Industrial Development		*	*	*	+	+	+	+
	Public Service Facilities		*	*	*	+	+	+	+
	Transportation Capital Projects		*	*	*	+	+	+	+
	Landfill/Solid Waste Management	Unlikely to incur land use compatibility impacts.	*	*	*	*	*	*	*
	Septic Installation, Repair, Extension; Underground Storage Tank Removal		*	*	*	*	*	*	*
	Transportation Maintenance Projects		*	*	*	*	*	*	*
	Water Resource Management		*	*	*	*	*	*	*
	Parks, Trails, and Rec. Lands Management		*	*	*	*	*	*	*

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
Land use policy/plan/regulation consistency	Residential Development	Thurston County land use planning and biological conservation have been concurrent processes and growth will progress with or without the HCP. HCP acknowledges GMA goals to preserve agricultural lands which may be in conflict with reserve area designation. Additional plans and policies may realize similar conflicts.	*	*	*	+	+	+	+
	Added Accessory Structures		*	*	*	+	+	+	+
	Commercial/Industrial Development		*	*	*	+	+	+	+
	Public Service Facilities		*	*	*	+	+	+	+
	Transportation Capital Projects		*	*	*	+	+	+	+
	Landfill/Solid Waste Management		*	*	*	+	+	+	+
	Septic Installation, Repair, Extension; Underground Storage Tank Removal		*	*	*	+	+	+	+
	Transportation Maintenance	Unlikely to incur land use plan, policy, or regulation consistency impacts.	*	*	*	*	*	*	*
	Water Resource Management		*	*	*	*	*	*	*
	Parks, Trails, and Rec. Lands Management		*	*	*	*	*	*	*

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
Agricultural (or other resource) land conversion	Residential Development	Covered activities may result in conversion of land not currently designated as resource land of long-term commercial significance but currently used for agriculture, timber, or mining resources.	*	*	*	+	+	+	+
	Added Accessory Structures		*	*	*	+	+	+	+
	Commercial/Industrial Development		*	*	*	+	+	+	+
	Public Service Facilities		*	*	*	+	+	+	+
	Transportation Capital Projects		*	*	*	+	+	+	+
	Landfill/Solid Waste Management		*	*	*	+	+	+	+
	Septic Installation, Repair, Extension; Underground Storage Tank Removal		*	*	*	+	+	+	+
	Transportation Maintenance	Unlikely to result in resource land conversion.	*	*	*	*	*	*	*
	Water Resource Management		*	*	*	*	*	*	*
	Parks, Trails, and Rec. Lands Management		*	*	*	*	*	*	*

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
Population distribution change	Residential Development	Covered activities may result in population distribution changes over population distribution envisioned and projected in Thurston County planning documents.	*	*	*	+	+	+	+
	Added Accessory Structures		*	*	*	+	+	+	+
	Commercial/Industrial Development		*	*	*	+	+	+	+
	Public Service Facilities		*	*	*	+	+	+	+
	Transportation Capital Projects		*	*	*	+	+	+	+
	Landfill/Solid Waste Management		*	*	*	+	+	+	+
	Septic Installation, Repair, Extension; Underground Storage Tank Removal		*	*	*	+	+	+	+
	Transportation Maintenance	Unlikely to result in resource land conversion.	*	*	*	*	*	*	*
	Water Resource Management		*	*	*	*	*	*	*
	Parks, Trails, and Rec. Lands Management		*	*	*	*	*	*	*

Table C-7. Recreation: Effect Mechanisms, Related Covered Activities, Description of Effects, and Potentially Mitigating Best Management Practices

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
Reduced acreage of open space available for recreational opportunities, as undeveloped parcels are converted to residential or commercial uses.	Residential Development	Land conversion associated with development may reduce recreation opportunities.	n/a	n/a	n/a	+	+	+	+
	Commercial/Industrial Development		n/a	n/a	n/a	+	+	+	+
	Public Service Facilities		n/a	n/a	n/a	+	+	+	+
	Transportation Capital Projects		n/a	n/a	n/a	+	+	+	+
	Landfill/Solid Waste Management		n/a	n/a	n/a	+	+	+	+
	Added Accessory Structures	Projects on private property or public property with existing infrastructure are unlikely to affect recreation opportunities.	n/a	n/a	n/a	*	*	*	*
	Septic Installation, Repair, Extension; Underground Storage Tank Removal		n/a	n/a	n/a	*	*	*	*
	Transportation Maintenance Projects		n/a	n/a	n/a	*	*	*	*
	Water Resource Management	Siting of water resource management facilities is unlikely to affect recreation opportunities.	n/a	n/a	n/a	*	*	*	*
	Parks, Trails, and Rec. Lands Management	Implementing park improvements may increase recreation opportunities.	n/a	n/a	n/a	-	-	-	*

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
Changes in the amount of publicly accessible undeveloped land (through dedication of currently developable parcels to long-term conservation).	Residential Development	By encouraging the implementation of mitigation in consolidated areas rather than at small, scattered sites on private property, the action alternatives may increase the amount of undeveloped land that is accessible to recreational users. It is not known, however, whether management plans for conservation sites established under the HCP would include restrictions (either seasonal or year-round) on public access.	n/a	n/a	n/a	*	*	-	*
	Commercial/Industrial Development		n/a	n/a	n/a	*	*	-	*
	Public Service Facilities		n/a	n/a	n/a	*	*	-	*
	Transportation Capital Projects		n/a	n/a	n/a	*	*	-	*
	Landfill/Solid Waste Management		n/a	n/a	n/a	*	*	-	*
	Added Accessory Structures		n/a	n/a	n/a	*	*	*	*
	Septic Installation, Repair, Extension; Underground Storage Tank Removal		n/a	n/a	n/a	*	*	*	*
	Transportation Maintenance Projects		n/a	n/a	n/a	*	*	*	*
	Water Resource Management		n/a	n/a	n/a	*	*	-	*
	Parks, Trails, and Rec. Lands Management		n/a	n/a	n/a	-	-	-	*

Table C-8. Socioeconomics and Environmental Justice Effect Mechanisms, Related Covered Activities, Description of Effects, and Potentially Mitigating Best Management Practices

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
Potential increase in the number of land development and capital projects due to lower cost and time savings for ESA compliance.	Residential Development	The costs of ESA compliance are anticipated to be less for projects within the land with species covered by the HCP, both in terms of time savings and decreased costs associated with hiring consultant staff. This can potentially result in more land development and capital projects. It can also result in such projects being completed more quickly.	*	+	*	+	+	*	*
	Commercial/Industrial Development		*	+	*	+	+	*	*
	Public Service Facilities		*	+	*	+	+	*	*
	Transportation Capital Projects		*	+	*	+	+	*	*
	Transportation Maintenance Projects	Unlikely to have significant socioeconomics or environmental justice effects.	*	*	*	*	*	*	*
	Added Accessory Structures	Unlikely to have significant socioeconomics or environmental justice effects.	*	*	*	*	*	*	*
	Septic Installation, Repair, Extension; Underground Storage Tank Removal	Unlikely to have significant socioeconomics or environmental justice effects.	*	*	*	*	*	*	*
	Landfill/Solid Waste Management	Unlikely to have significant socioeconomics or environmental justice effects.	*	*	*	*	*	*	*
	Water Resource Management	Unlikely to have significant socioeconomics or environmental justice effects.	*	*	*	*	*	*	*

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
	Parks, Trails, and Rec. Lands Management	Unlikely to have significant socioeconomics or environmental justice effects.	*	*	*	*	*	*	*
Economic development can potentially be restrained due to use of the land constrained in perpetuity because of easements.	Residential Development	Several hundred acres over the years are anticipated to go into easements on working lands for the HCP in addition to the fee acquisitions made by the County for the conservation program. The economic issues surrounding easements stem from the idea that the use of the land is constrained in perpetuity, and this can place a restraint on economic development.	*	+	*	+	+	*	*
	Commercial/Industrial Development		*	+	*	+	+	*	*
	Public Service Facilities	Unlikely to have significant socioeconomics or environmental justice effects.	*	*	*	*	*	*	*
	Transportation Capital Projects		*	*	*	*	*	*	*
	Transportation Maintenance Projects		*	*	*	*	*	*	*
	Added Accessory Structures		*	*	*	*	*	*	*
	Septic Installation, Repair, Extension; Underground Storage Tank Removal		*	*	*	*	*	*	*
	Landfill/Solid Waste Management		*	*	*	*	*	*	*
	Water Resource Management		*	*	*	*	*	*	*

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
	Parks, Trails, and Rec. Lands Management		*	*	*	*	*	*	*
Potential increase in property values and, consequently, the tax base, stemming from conservation of open space.	Residential Development	The conservation of open space could have the effect of increasing property values of the surrounding land. These increases could result in beneficial impacts to the tax base.	*	+	*	+	+	*	*
	Commercial/Industrial Development		*	+	*	+	+	*	*
	Public Service Facilities		*	*	*	*	*	*	*
	Transportation Capital Projects	Unlikely to have significant socioeconomics or environmental justice effects.	*	*	*	*	*	*	*
	Transportation Maintenance Projects		*	*	*	*	*	*	*
	Added Accessory Structures		*	*	*	*	*	*	*
	Septic Installation, Repair, Extension; Underground Storage Tank Removal		*	*	*	*	*	*	*
	Landfill/Solid Waste Management		*	*	*	*	*	*	*
	Water Resource Management		*	*	*	*	*	*	*
	Parks, Trails, and Rec. Lands Management		*	*	*	*	*	*	*

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
Potential fiscal impacts on County revenues, through business taxes, sales taxes, and other municipal revenues.	Residential Development	It is anticipated that the Proposed Action Alternative will result in some fiscal impacts on County revenues, through business taxes, sales taxes, and other municipal revenues. This could stem from additional land development activities due to lower ESA compliance costs and shorter timelines for such projects. The resulting effect on employment and income could also potentially affect the tax base.	*	+	*	+	+	*	*
	Commercial/Industrial Development		*	+	*	+	+	*	*
	Public Service Facilities	Unlikely to have significant socioeconomics or environmental justice effects.	*	*	*	*	*	*	*
	Transportation Capital Projects		*	*	*	*	*	*	*
	Transportation Maintenance Projects		*	*	*	*	*	*	*
	Added Accessory Structures		*	*	*	*	*	*	*
	Septic Installation, Repair, Extension; Underground Storage Tank Removal		*	*	*	*	*	*	*
	Landfill/Solid Waste Management		*	*	*	*	*	*	*
	Water Resource Management		*	*	*	*	*	*	*

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
	Parks, Trails, and Rec. Lands Management		*	*	*	*	*	*	*
Potential effects on rural property owners due to HCP fees.	Residential Development	It is anticipated that the Proposed Action Alternative will result in some fiscal impacts on County revenues, through business taxes, sales taxes, and other municipal revenues. This could stem from additional land development activities due to lower ESA compliance costs and shorter timelines for such projects. The resulting effect on employment and income could also potentially affect the tax base.	*	+	*	+	+	*	*
	Commercial/Industrial Development		*	+	*	+	+	*	*
	Public Service Facilities	Unlikely to have significant socioeconomics or environmental justice effects.	*	*	*	*	*	*	*
	Transportation Capital Projects		*	*	*	*	*	*	*
	Transportation Maintenance Projects		*	*	*	*	*	*	*
	Added Accessory Structures		*	*	*	*	*	*	*
	Septic Installation, Repair, Extension; Underground Storage Tank Removal		*	*	*	*	*	*	*
	Landfill/Solid Waste Management		*	*	*	*	*	*	*
	Water Resource Management		*	*	*	*	*	*	*

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
	Parks, Trails, and Rec. Lands Management		*	*	*	*	*	*	*
Lower income, minority, and other vulnerable populations within the rural property owners could be disproportionately affected while undertaking certain covered activities.	Residential Development	Unlikely to have significant socioeconomics or environmental justice effects.	*	*	*	*	*	*	*
	Commercial/Industrial Development		*	*	*	*	*	*	*
	Public Service Facilities		*	*	*	*	*	*	*
	Transportation Capital Projects		*	*	*	*	*	*	*
	Transportation Maintenance Projects		*	*	*	*	*	*	*
	Added Accessory Structures	Rural property owners who might be undertaking one of the covered activities, such as “Added accessory structures” or “Septic extension or repair,” will face HCP fees under the Proposed Action Alternative.	*	+	*	+	+	*	*
	Septic Installation, Repair, Extension; Underground Storage Tank Removal	It is anticipated that the rural landowners may include lower income minority, and other vulnerable populations, who could be disproportionately affected by the Proposed Action Alternative.	*	+	*	+	+	*	*
	Landfill/Solid Waste Management	Unlikely to have significant socioeconomics or environmental justice effects.	*	*	*	*	*	*	*
	Water Resource Management		*	*	*	*	*	*	*

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
	Parks, Trails, and Rec. Lands Management		*	*	*	*	*	*	*
Programs for lower income, minority, and other vulnerable groups could be disproportionately affected due to changes in County revenues.	Residential Development	The changes in County revenues could also disproportionately affect programs for lower income minority, and other vulnerable populations, but that would mostly be speculative.	*	*	*	*	*	*	*
	Commercial/Industrial Development		*	*	*	*	*	*	*
	Public Service Facilities		*	*	*	*	*	*	*
	Transportation Capital Projects	Unlikely to have significant socioeconomics or environmental justice effects.	*	*	*	*	*	*	*
	Transportation Maintenance Projects		*	*	*	*	*	*	*
	Added Accessory Structures		*	*	*	*	*	*	*
	Septic Installation, Repair, Extension; Underground Storage Tank Removal		*	*	*	*	*	*	*
	Landfill/Solid Waste Management		*	*	*	*	*	*	*
	Water Resource Management		*	*	*	*	*	*	*
	Parks, Trails, and Rec. Lands Management		*	*	*	*	*	*	*
	Water Resource Management		*	*	*	*	*	*	*
	Parks, Trails, and Rec. Lands Management								

Table C-9. Aesthetics, Light, and Glare: Effect Mechanisms, Related Covered Activities, Description of Effects, and Potentially Mitigating Best Management Practices

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
Alteration of the visual character of currently undeveloped sites through the conversion of undeveloped open space, native vegetation, and natural terrain to commercial or residential uses.	Residential Development	Land conversion associated with developments may affect the visual character of the landscape.	n/a	n/a	n/a	+	+	+	+
	Commercial/Industrial Development		n/a	n/a	n/a	+	+	+	+
	Public Service Facilities		n/a	n/a	n/a	+	+	+	+
	Transportation Capital Projects		n/a	n/a	n/a	+	+	+	+
	Landfill/Solid Waste Management		n/a	n/a	n/a	+	+	+	+
	Added Accessory Structures	Small-scale projects may marginally affect visual character.	n/a	n/a	n/a	+	+	+	+
	Water Resource Management		n/a	n/a	n/a	+	+	+	+
	Transportation Maintenance Projects	Subsurface projects and maintenance of existing infrastructure have no potential to affect visual character.	n/a	n/a	n/a	*	*	*	*
	Septic Installation, Repair, Extension; Underground Storage Tank Removal		n/a	n/a	n/a	*	*	*	*
	Parks, Trails, and Rec. Lands Management	Unlikely to result in land conversion that affects visual character.	n/a	n/a	n/a	*	*	*	*

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
Increased availability of comparatively large blocks undeveloped land on the landscape.	Residential Development	By encouraging the implementation of mitigation in consolidated areas rather than at small, scattered sites, the action alternatives may result in the creation of larger blocks of land with natural visual characteristics, compared to the no-action alternative.	n/a	n/a	n/a	-	-	-	-
	Commercial/Industrial Development		n/a	n/a	n/a	-	-	-	-
	Public Service Facilities		n/a	n/a	n/a	-	-	-	-
	Transportation Capital Projects		n/a	n/a	n/a	-	-	-	-
	Landfill/Solid Waste Management		n/a	n/a	n/a	-	-	-	-
	Added Accessory Structures		n/a	n/a	n/a	-	-	-	-
	Septic Installation, Repair, Extension; Underground Storage Tank Removal		n/a	n/a	n/a	-	-	-	-
	Transportation Maintenance Projects		n/a	n/a	n/a	-	-	-	-
	Water Resource Management		n/a	n/a	n/a	-	-	-	-
	Parks, Trails, and Rec. Lands Management		n/a	n/a	n/a	-	-	-	-

Table C-10. Historic and Cultural Resources: Effect Mechanisms, Related Covered Activities, Description of Effects, and Potentially Mitigating Best Management Practices

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
Ground-disturbing work (e.g., clearing, grubbing, excavation, site preparation for mitigation activities) at sites where cultural or historic resources are present.	Residential Development and Added Accessory Structures	Physical alteration of cultural or historic resources or their setting in a manner that alters the character or use of the resource.	+	+	+	+	*	+	*
	Commercial/Industrial Development		+	+	+	+	*	+	*
	Public Service Facilities		+	+	+	+	*	+	*
	Transportation Capital Projects		+	+	+	+	*	+	*
	Landfill/Solid Waste Management		+	+	+	+	*	+	*
	Septic Installation, Repair, Extension; Underground Storage Tank Removal		+	+	+	+	*	+	*
	Transportation Maintenance Projects		+	+	+	+	*	+	*
	Water Resource Management		+	+	+	+	*	+	*
	Parks, Trails, and Rec. Lands Management		+	+	+	+	*	+	*

Table C-11. Transportation: Effect Mechanisms, Related Covered Activities, Description of Effects, and Potentially Mitigating Best Management Practices

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
Short-term increase in traffic volumes during construction of proposed covered activities.	Residential Development	Construction of new residential and commercial/industrial areas, public facilities, and transportation infrastructure may affect short-term traffic volumes.	n/a	n/a	n/a	*	*	*	*
	Commercial/Industrial Development		n/a	n/a	n/a	*	*	*	*
	Public Service Facilities		n/a	n/a	n/a	*	*	*	*
	Transportation Capital Projects		n/a	n/a	n/a	*	*	*	*
	Landfill/Solid Waste Management		n/a	n/a	n/a	*	*	*	*
	Transportation Maintenance Projects	Small-scale projects and maintenance of existing infrastructure may marginally affect short-term traffic volumes.	n/a	n/a	n/a	*	*	*	*
	Water Resource Management		n/a	n/a	n/a	*	*	*	*
	Parks, Trails, and Rec. Lands Management		n/a	n/a	n/a	*	*	*	*
	Added Accessory Structures	Unlikely to affect short-term traffic volumes.	n/a	n/a	n/a	*	*	*	*
	Septic Installation, Repair, Extension; Underground Storage Tank Removal		n/a	n/a	n/a	*	*	*	*

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
Long-term changes in traffic volumes associated with new residential or commercial development in currently undeveloped areas.	Residential Development	Development of new residential and commercial/industrial areas, public facilities, and transportation infrastructure may increase long-term traffic volumes.	n/a	n/a	n/a	+	+	*	*
	Commercial/Industrial Development		n/a	n/a	n/a	+	+	*	*
	Public Service Facilities		n/a	n/a	n/a	+	+	*	*
	Transportation Capital Projects		n/a	n/a	n/a	+	+	*	*
	Landfill/Solid Waste Management		n/a	n/a	n/a	+	+	*	*
	Added Accessory Structures	Unlikely to affect long-term changes in traffic volumes.	n/a	n/a	n/a	*	*	*	*
	Septic Installation, Repair, Extension; Underground Storage Tank Removal		n/a	n/a	n/a	*	*	*	*
	Transportation Maintenance Projects		n/a	n/a	n/a	*	*	*	*
	Water Resource Management		n/a	n/a	n/a	*	*	*	*
	Parks, Trails, and Rec. Lands Management		n/a	n/a	n/a	*	*	*	*

Table C-12. Public Services and Utilities: Effect Mechanisms, Related Covered Activities, Description of Effects, and Potentially Mitigating Best Management Practices

Effect Mechanism	Covered Activity	Description of Effect	Best Management Practices that May Limit Impact Mechanisms or Mitigate Effects from Covered Activities						
			Special Management Areas	Exempt Activities		Standard BMPs		Enhanced BMPs	
			Oregon Spotted Frog	Single Family Residential	Agriculture	Prairie Habitat	Oregon Spotted Frog Habitat	Prairie Habitat	Oregon Spotted Frog
Long-term increases in demand for public services due to new residential or commercial development in currently undeveloped areas.	Residential Development	Residential and commercial development may increase the demand for public services.	n/a	n/a	n/a	+	+	*	*
	Commercial/Industrial Development		n/a	n/a	n/a	+	+	*	*
	Public Service Facilities		n/a	n/a	n/a	-	-	-	-
	Landfill/Solid Waste Management	[These covered activities are examples of public service projects.]	n/a	n/a	n/a	-	-	-	-
	Water Resource Management		n/a	n/a	n/a	-	-	-	-
	Added Accessory Structures		n/a	n/a	n/a	*	*	*	*
	Septic Installation, Repair, Extension; Underground Storage Tank Removal	Unlikely to affect demand for public services.	n/a	n/a	n/a	*	*	*	*
	Transportation Capital Projects		n/a	n/a	n/a	*	*	*	*
	Transportation Maintenance Projects		n/a	n/a	n/a	*	*	*	*
	Parks, Trails, and Rec. Lands Management		n/a	n/a	n/a	*	*	*	*

Appendix D

Supporting Information for Plants and Animals



Table D-1. Plants of the Thurston County Fescue/White-Top Aster Community

Common Name	Scientific Name
Common camas	<i>Camassia quamash</i>
Long-stolon sedge	<i>Carex inops</i>
California danthonia	<i>Danthonia californica</i>
Field woodrush	<i>Luzula multiflora</i>
Woolly sunflower	<i>Eriophyllum lanatum</i>
Houndstongue hawkweed	<i>Hieracium cynoglossoides</i>
White-top aster	<i>Aster curtus</i>
Cutleaf microseris	<i>Microseris laciniata</i>
Broadpetal strawberry	<i>Fragaria virginiana</i> var. <i>playpetala</i>
Spikelike goldenrod	<i>Solidago spathulata</i>
Early blue violet	<i>Viola adunca</i>
Prairie lupine	<i>Lupinus lepidus</i>
Western buttercup	<i>Ranunculus occidentalis</i>
Yarrow	<i>Achillea millefolium</i>
Meadow death-camas	<i>Zygadenus venenosus</i>
Slender cinquefoil	<i>Potentilla gracilis</i>
Common lomatium	<i>Lomatium utriculatum</i>
Henderson's shooting star	<i>Dodecatheon hendersonii</i>
Brackenfern	<i>Pteridium aquilinum</i>
Puget balsamroot	<i>Balsamorhiza deltoidea</i>
Serviceberry	<i>Amelanchier alnifolia</i>
Black hawthorn	<i>Crataegus douglasii</i>
Kinnikinnick	<i>Arctostaphylos uva-ursi</i>

Source: Chappell and Crawford 1997

Table D-2. Species on the Thurston County Noxious Weeds List That Are Known to Occur in the County

Common Name	Scientific Name
Brazilian elodea	<i>Egeria densa</i>
Bugloss, annual	<i>Anchusa arvensis</i>
Bugloss, common	<i>Anchusa officinalis</i>
Common fennel except variety <i>azoricum</i>	<i>Foeniculum vulgare</i>
Common reed (non-native genotypes)	<i>Phragmites australis</i>
Dalmatian toadflax	<i>Linaria dalmatica</i> ssp. <i>dalmatica</i>
European coltsfoot	<i>Tussilago farara</i>
Giant hogweed	<i>Heracleum mantegazzianum</i>
Gorse	<i>Ulex europaeus</i>
Hawkweed, mouseear	<i>Hieracium pilosella</i>
Hawkweed, orange	<i>Hieracium aurantiacum</i>
Hawkweed, wall	<i>Hieracium murorum</i>
Hawkweed, yellow	<i>Hieracium caespitosum</i>
Hawkweed, yellow devil	<i>Hieracium floribundum</i>
Knapweed, diffuse	<i>Centaurea diffusa</i>
Knapweed, meadow	<i>Centaurea jacea</i> x <i>nigra</i>
Knapweed, spotted	<i>Centaurea biebersteinii</i>
Knotweed, Bohemian	<i>Polygonum Bohemicum</i>
Knotweed, giant	<i>Polygonum sachalinense</i>
Knotweed, Himalayan	<i>Persicaria wallichii</i>
Knotweed, Japanese	<i>Polygonum cuspidatum</i>
Loosestrife, purple	<i>Lythrum salicaria</i>
Pampas grass	<i>Cortaderia seloana</i>
Parrotfeather	<i>Myriophyllum aquaticum</i>
Perennial pepperweed	<i>Lepidium latifolium</i>
Perennial sowthistle	<i>Sonchus arvensis</i> ssp. <i>arvensis</i>
Poison hemlock	<i>Conium maculatum</i>
Rush skeletonweed	<i>Chondrilla juncea</i>
Shiny geranium	<i>Geranium Lucidum</i>
Spurge laurel	<i>Daphne laureola</i>
Sulfur cinquefoil	<i>Potentilla recta</i>
Tansy ragwort	<i>Jacobaea vulgaris</i>
Thistle, Italian	<i>Carduus pycnocephalus</i>
Thistle, Scotch	<i>Onopordum acanthium</i>
Thistle, slenderflower	<i>Carduus tenuiflorus</i>
Variable-leaf milfoil	<i>Myriophyllum heterophyllum</i>
Wild chervil	<i>Anthriscus sylvestris</i>
Yellow flag iris	<i>Iris pseudacorus</i>

Source: Thurston County 2020.

Table D-3. Invasive Noxious, Native, and Pasture/Turf Species Affecting the Prairie Ecosystem

Common Name	Scientific Name
Colonial bentgrass	<i>Agrostis tenuis</i>
Sweet vernalgrass	<i>Anthoxanthum odoratum</i>
Tall oatgrass	<i>Arrhenatherum elatius</i>
Oxeye daisy	<i>Chrysanthemum leucanthemum</i>
Scotch broom	<i>Cytisus scoparius</i>
Velvet grass	<i>Holcus lanatus</i>
St. John's wort	<i>Hypericum perforatum</i>
False dandelion or cat's ear	<i>Hypochaeris radicata</i>
English plantain	<i>Plantago lanceolata</i>
Kentucky bluegrass	<i>Poa pratense</i>
Nootka rose	<i>Rosa nutkana</i>
Sheep sorrel	<i>Rumex acetosella</i>
Common snowberry	<i>Symphoricarpos albus</i>
Common shepherdscress	<i>Teesdalia nudicaulis</i>

Source: Stinson 2005.

Table D-4. WDFW Priority Species in Thurston County

Species Type	Species Name	State Status	Federal Status
Fishes	Pacific Lamprey		
	River Lamprey	Candidate	
	White Sturgeon		
	Olympic Mudminnow	Sensitive	
	Pacific Herring	Candidate	
	Longfin Smelt		
	Surf Smelt		
	Bull Trout/ Dolly Varden	Candidate (Bull trout only)	Threatened (Bull Trout only)
	Chinook Salmon	Candidate	Threatened
	Chum Salmon	Candidate	Threatened
	Coastal Resident/ Sea-run Cutthroat		
	Coho Salmon		
	Pink Salmon		
	Rainbow Trout/ Steelhead/ Inland Redband Trout	Candidate (Steelhead only)	Threatened (Steelhead only)
	Sockeye Salmon	Candidate	
	Pacific Cod	Candidate	
	Pacific Hake	Candidate	
	Walleye Pollock	Candidate	
	Brown Rockfish	Candidate	
	Copper Rockfish	Candidate	
	Quillback Rockfish	Candidate	
	Lingcod		
	Pacific Sand Lance		
	English Sole		
	Rock Sole		
Amphibians	Cascade Torrent Salamander	Candidate	
	Van Dyke's Salamander	Candidate	
	Oregon spotted frog	Endangered	Threatened
	Western Toad	Candidate	
Reptiles	Western Pond Turtle (formerly Pacific Pond Turtle)	Endangered	
Birds	Common Loon	Sensitive	
	Marbled Murrelet	Threatened	Threatened
	Western grebe	Candidate	
	W WA nonbreeding concentrations of: Loons, Grebes, Cormorants, Fulmar, Shearwaters, Storm-petrels, Alcids		
	W WA breeding concentrations of: Cormorants, Storm-petrels, Terns, Alcids		
	Great Blue Heron		
	Western High Arctic Brant (formerly called Brant)		
	Cavity-nesting ducks: Wood Duck, Barrow's Goldeneye, Common		

Species Type	Species Name	State Status	Federal Status
	Goldeneye, Bufflehead, Hooded Merganser		
	Western Washington nonbreeding concentrations of: Barrow's Goldeneye, Common Goldeneye, Bufflehead		
	Harlequin Duck		
	Waterfowl Concentrations		
	Golden Eagle	Candidate	
	Mountain Quail		
	Sooty Grouse		
	Wild Turkey		
	W WA nonbreeding concentrations of: Charadriidae, Scolopacidae, Phalaropodidae		
	Band-tailed Pigeon		
	Yellow-billed Cuckoo	Endangered	Threatened
	Northern Spotted Owl	Endangered	Threatened
	Vaux's Swift	Candidate	
	Pileated Woodpecker	Candidate	
	Oregon vesper sparrow	Endangered	
	Slender-billed White-breasted Nuthatch	Candidate	
	Streaked Horned Lark	Endangered	Threatened
Mammals	Dall's Porpoise		
	Harbor Seal		
	Orca (Killer Whale)	Endangered	Endangered
	Harbor Porpoise	Candidate	
	California Sea Lion		
	Roosting Concentrations of: Big-brown Bat, Myotis bats, Pallid Bat		
	Townsend's Big-eared Bat	Candidate	
	Western Gray Squirrel	Threatened	
	Mazama (Western) pocket gopher	Threatened	Threatened (<i>glacialis</i> , <i>pugetensis</i> , <i>tumuli</i> , and <i>yelmensis</i> subspecies only)
	Fisher	Endangered	
	Marten		
	Columbian Black-tailed Deer		
	Elk		
Invertebrates	Pacific Geoduck (formerly Geoduck)		
	Butter Clam		
	Native Littleneck Clam		
	Manila (Japanese) Littleneck Clam (formerly called Manila Clam)		
	Olympia Oyster	Candidate	
	Pacific Oyster		
	Dungeness Crab		
	Pandalid shrimp (Pandalidae)		
	Beller's Ground Beetle	Candidate	
	Pacific Clubtail	Candidate	
	Leschi's Millipede	Candidate	

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Species Type	Species Name	State Status	Federal Status
	Mardon Skipper	Endangered	
	Puget Blue	Candidate	
	Valley Silverspot	Candidate	
	Taylor's Checkerspot	Endangered	Endangered
Plants	Tall bugbane (<i>Actaea elata</i> var. <i>elata</i>)	Sensitive	
	Tall agoseris (<i>Agoseris elata</i>)	Sensitive	
	Marsh sandwort (<i>Arenaria paludicola</i>)	Presumed Extirpated	Endangered
	Dense sedge (<i>Carex densa</i>)	Sensitive	
	Golden paintbrush (<i>Castilleja levisecta</i>)	Threatened	Threatened
	Bulb-bearing water-hemlock (<i>Cicuta bulbifera</i>)	Sensitive	
	Pacific fringed thistle (<i>Cirsium remotifolium</i>)	Sensitive	
	Tree-clubmoss (<i>Dendrolycopodium dendroideum</i>)	Sensitive	
	Coast fawn-lily (<i>Erythronium revolutum</i>)	Sensitive	
	Western wahoo (<i>Euonymus occidentalis</i> var. <i>occidentalis</i>)	Sensitive	
	Common blue-cap (<i>Githopsis specularioides</i>)	Sensitive	
	Oregon goldenweed (<i>Heterotheca oregona</i>)	Sensitive	
	Water howellia (<i>Howellia aquatilis</i>)	Threatened	Threatened
	Large St. Johns'-wort (<i>Hypericum majus</i>)	Sensitive	
	Nuttall's quillwort (<i>Isoetes nuttallii</i>)	Sensitive	
	Pacific peavine (<i>Lathyrus vestitus</i> var. <i>ochropetalus</i>)	Endangered	
	True babystars (<i>Leptosiphon minimus</i>)	Sensitive	
	Kincaid's lupine (<i>Lupinus sulphureus kinkaidii</i>)		Threatened
	Northern bog clubmoss (<i>Lycopodiella inundata</i>)	Sensitive	
	Large-flowered blue toadflax (<i>Nuttallanthus texanus</i>)	Threatened	
	Puget groundsel (<i>Packera macounii</i>)	Threatened	
	Pine-foot (<i>Pityopus californica</i>)	Threatened	

Species Type	Species Name	State Status	Federal Status
	Salmon Jacob's-ladder (<i>Polemonium carneum</i>)	Threatened	
	California sword-fern (<i>Polystichum californica</i>)	Threatened	
	Blunt-leaved pondweed (<i>Potamogeton obtusifolius</i>)	Sensitive	
	Columbia white-topped aster (<i>Sericocarpus rigidus</i>)	Sensitive	
	Nelson's checker-mallow (<i>Sidalcea nelsonianna</i>)	Endangered	Threatened
	Rose checkermallow (<i>Sidalcea virgata</i>)	Threatened	
	Scouler's catchfly (<i>Silene scouleri</i> ssp. <i>scouleri</i>)	Sensitive	
	Hall's aster (<i>Symphyotrichum hallii</i>)	Threatened	
	Small-flowered trillium (<i>Trillium albidum</i> ssp. <i>parviflorum</i>)	Sensitive	
	Whipplevine (<i>Whipplea modesta</i>)	Threatened	
	Chain-fern (<i>Woodwardia fimbriata</i>)	Sensitive	
	Narrow-leaf mule's-ears (<i>Wyethia angustifolia</i>)	Sensitive	

Sources: WDFW 2020, WDNR 2019

Table D-5. Thurston County Priority Invasive Wildlife and Freshwater Plant Species

Species Type	Species Common Name	Species Scientific Name
Amphibians	African clawed frog	<i>Xenopus laevis</i>
	American bullfrog	<i>Lithobates catesbeianus</i>
Reptiles	Snapping turtle	<i>Chelydra serpentina</i>
	Red-eared slider	<i>Trachemys scripta elegans</i>
Bryozoan	Magnificent sryozoan	<i>Pectinatella magnifica</i>
	Bryozoan	<i>Stephanella hina</i>
Fishes	Rock bass	<i>Ambloplites rupestris</i>
	Pumpkinseed	<i>Lepomis gibbosus</i>
	Warmouth	<i>Lepomis gulosus</i>
	Bluegill	<i>Lepomis macrochirus</i>
	Smallmouth bass	<i>Micropterus dolomieu</i>
	Largemouth bass	<i>Micropterus salmoides</i>
	White crappie	<i>Pomoxis annularis</i>
	Black crappie	<i>Pomoxis nigromaculatus</i>
	Grass carp	<i>Ctenopharyngodon idella</i>
	Common carp	<i>Cyprinus carpio</i>
	Golden shiner	<i>Notemigonus crysoleucas</i>
	Brown bullhead	<i>Ameiurus nebulosus</i>
	Yellow perch	<i>Perca flavescens</i>
	Walleye	<i>Sander vitreus</i>
	Atlantic salmon	<i>Salmo salar</i>
	Brown trout	<i>Salmo trutta</i>
Mammals	Nutria	<i>Myocastor coypus</i>
Mollusks	Asian clam	<i>Corbicula fluminea</i>
	Pacific giant oyster	<i>Crassostrea gigas</i>
	New Zealand mudsnail	<i>Potamopyrgus antipodarum</i>
	European ear snail	<i>Radix auricularia</i>
	Chinese mystersnail	<i>Cipangopaludina chinensis</i>
Freshwater Plants	Delta arrowhead	<i>Sagittaria platyphylla</i>
	forget-me-not	<i>Myosotis scorpioides</i>
	water-cress	<i>Nasturtium officinale</i>
	watermilfoil	<i>Myriophyllum heterophyllum</i>
	Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
	Wild celery	<i>Vallisneria americana</i>
	Yellow iris	<i>Iris pseudacorus</i>
	Peppermint	<i>Mentha X piperita</i>
	Swollen bladderwort	<i>Utricularia inflata</i>
	Purple loosestrife	<i>Lythrum salicaria</i>
	American white waterlily	<i>Nymphaea odorata</i>
	Pond water-starwort	<i>Callitriche stagnalis</i>
	Northern wild rice	<i>Zizania palustris</i> var. <i>palustris</i>
	Marshpepper knotweed	<i>Persicaria hydropiper</i>
	Curly-leaf pondweed	<i>Potamogeton crispus</i>
Freshwater/Brackish Plants	Brazilian waterweed	<i>Egeria densa</i>

Source: USGS 2020.

References:

- Chappell, C. and R. C. Crawford. 2005. Native Vegetation of the South Puget Sound Prairie Landscape. Washington Natural Heritage Program, Washington Department of Natural Resources, Olympia, WA. 18 pp.
- Stinson, D. W. 2005. Washington state status report for the Mazama Pocket Gopher, Streaked Horned Lark, and Taylor's Checkerspot. Washington Department of Fish and Wildlife, Olympia, WA. 102+vii pp. Available at: <http://wdfw.wa.gov/publications/00390/>. Accessed March 2021
- Thurston County. 2020. Thurston County Noxious Weed List. Available at: <https://www.co.thurston.wa.us/tcweeds/weed-list.htm>. Accessed November 25, 2020.
- USGS (United States Geologic Survey). 2020. Non-Indigenous Invasive Species. Available at: <https://nas.er.usgs.gov/queries/SpeciesList.aspx?group=&size=100&sortBy=1&status=0&fmb=0&pathway=0&stcolist=WA%20--%20Thurston>. Accessed November 25, 2020.
- WDFW (Washington Department of Fish and Wildlife). 2020. Priority Habitats and Species List. Available at: <https://wdfw.wa.gov/publications/00165>. Accessed November 25, 2020.
- WDNR (Washington Department of Natural Resources). 2019. Washington Vascular Plant Species of Special Concern. Washington Natural Heritage Program Report Number 2019-04, July 15, 2019. Available at <https://www.dnr.wa.gov/NHPlists>. Accessed August 6, 2021.

Appendix E

Public Scoping Comments



APPENDIX E: PUBLIC SCOPING COMMENTS

This appendix presents a summary of alternatives, information, and analyses submitted during the public scoping periods, pursuant to 40 CFR § 1501.9, 40 CFR § 1502.17, and WAC 197-11-408. The full text of all comment letters is appended.

Background on Public Scoping Comments

USFWS initially published an initial Notice of Intent (NOI) to prepare a draft Environmental Impact Statement (EIS) for the Thurston County Habitat Conservation Plan (HCP) on March 20, 2013 (78 FR 17224). In response, USFWS and the County received 23 comment letters. USFWS issued a new NOI on October 16, 2020 (85 FR 65861), in response to the incidental take permit (ITP) application submitted by Thurston County. The NOI opened a 30-day public scoping period through November 16, 2020. USFWS received 19 comment letters during this scoping period, as well as a letter and a related email from the U.S. Environmental Protection Agency (EPA) on November 18, 2020, and December 17, 2020, respectively. During the 2020 scoping period, Thurston County concurrently accepted public scoping comments pursuant to the Washington State Environmental Policy Act (SEPA) through a collaborative effort with USFWS and received five public comment letters. All comments were considered in preparation of this draft EIS and are included in this appendix. We attempted to redact personal contact information; however, privacy of commenters is not guaranteed. In the following subsections, comment letters are grouped by 2020 NEPA comments, 2020 SEPA comments, and 2013 comments.

Comment Summary

This section summarizes alternatives, information, and analyses identified through public scoping comments. We considered each comment letter in full.

Alternatives

Commenters identified alternatives for consideration, summarized here:

- Consider an incentive program as alternative to the HCP.
- Consider a shorter permit term, especially if covering a broad list of species.
- Consider HCP coverage for utility construction in county jurisdiction, as included in the proposed action.
- Focus development in cities and urban growth areas.
- Prioritize conservation with multiple benefits, including groundwater/drinking water, wetlands, Puget Sound health, and other ecosystems.
- Pursue net gains in prairie habitat.
- Align HCP with landscape-level efforts for the Prairies: establish conservation banks, prioritize the largest habitat patches, establish connectivity corridors, provide redundancy/refugia/restoration, work with partners, etc.
- Analyze a “Modified Mitigation” alternative to provide for highest conservation benefit.

Information

Comments identified information for consideration, summarized here:

- Consider impacts on additional species to ensure their survival.
- Review existing recovery and restoration plans including:
 - Mazama pocket gopher status update and recovery plan
 - Status review for Taylor's checkerspot butterfly
 - Oregon vesper sparrow draft recovery plan
 - Oregon spotted frog draft recovery plan
 - Occupancy data in Chehalis Basin Strategy Aquatic Species Restoration Plan
- Use active management to restore prairies.
- Consider specific actions as part of cumulative effects.
- Consider the population size and isolation of Mazama pocket gopher and risk of extinction.
- Recognize state protections related to species and climate change in the No Action Alternative.
- Include [Tribal] traditional ecological knowledge and recognize the historic and cultural significance of the prairie habitats.
- Consider how climate change, such as changes in rainfall, may require additional measures to ensure long-term survival.
- Consider whether there is enough information to cover all the species identified in early phases of HCP development.
- Consider whether the “No action” alternative results in economic hardship for landowners and conflict with government.
- Adhere to scientific goals.
- Question about how the HCP addresses additional ESA listings.
- HCP will operate best with active mitigation banks.
- HCP will work for Public Works and Public Works will use it.
- Ensure grading and filling of land will utilize only clean fill and consider whether additional permit approval or coordination may be required from the local jurisdictional health department.

Analyses

Commenters identified analyses for consideration, summarized here:

- Analyze water quality impacts related to impacted waters and stormwater, considering 303(d) listed waters, stormwater discharges, the nature of impacts, and pollutants.
- Analyze aquatic resources related to waters of the US and wetlands, with particular consideration to floodplains and to dredge and fill in surface waters of the United States.

- Analyze impacts related to solid waste, hazardous materials, wastewater management, and contaminated sites.
- Analyze air quality impacts, considering ambient air conditions, national Ambient Air Quality Standards, and criteria pollutant non-attainment areas, if applicable. Address emissions over time from mobile and stationary sources, as well as ground disturbance.
- Clarify where Mazama pocket gopher 4(d) rule applies for take analysis and mitigation strategies, especially in relation to take of other species.
- The scale of the analysis should include more than unincorporated areas.
- Analytical scope should address land development and other prairie-incompatible uses.
- Evaluate efficacy of existing conservation efforts relative to conservation needs of the species.
- The HCP should address climate change impacts on covered species.
- Address private landowner economic needs.
- Evaluate the probability of species occupancy and how this information could be modified over time.

Comment Letters

2020 Scoping Comments: NEPA

The following letters were received through 2020 NEPA public scoping.

1. MD Edwards
2. Anonymous
3. Black Hills Audubon Society
4. Gregory Davis
5. Puget Sound Energy
6. South Sound Sierra Club Group
7. Bill Yake
8. Anonymous
9. Victoria Lopez
10. Anonymous
11. Kenneth M Stone
12. Charlotte Zinski
13. Washington Department of Fish and Wildlife
14. LOTT Clean Water Alliance
15. Mark kitabbyaashi
16. Jean pubileee
17. Charlotte Zinski
18. Natural Resources Defense Council
19. Kirsten Randall
20. US Environmental Protection Agency (Letter, attachment, and email)

2020 Scoping Comments: SEPA

The following letters were received through 2020 SEPA public scoping.

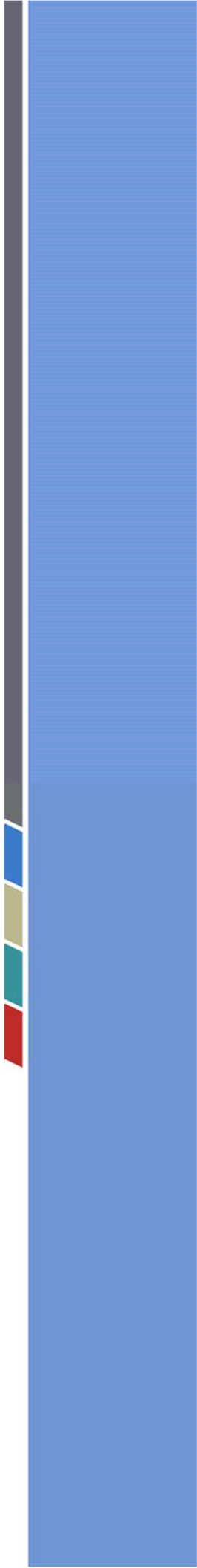
1. Thurston County Public Works
2. Puget Sound Energy
3. South Sound Sierra Club Group
4. LOTT Clean Water Alliance
5. Washington Department of Ecology

2013 Scoping Comments: NEPA Only

The following letters were received through 2013 NEPA public scoping.

1. Thurston County Chamber of Commerce via Phillips Wesch Burgess PLLC
2. Thurston County Chamber
3. US Environmental Protection Agency
4. City of Rainier
5. Dirk Fiarrier
6. Key McMurry, Key Environmental Solutions LLC
7. Kara Tebeau
8. Rick Nelson
9. Mel Murray
10. Jerry Tiff
11. Key McMurry, Key Environmental Solutions LLC
12. North Thurston Public Schools
13. Tumwater School District with Superintendents of Griffin, North Thurston, Olympia, Rochester, Tumwater, and Yelm Community school districts
14. Andrew Barkis
15. Jim Goldsmith
16. Ben Cody
17. Sandra Blake
18. Dave Pyle
19. Mark Carlson
20. Jean public
21. Ross Barkhurst
22. Michael Leigh
23. James Goche for Friendly Grove Farm / Market Gardens Northwest LLC (highlighted text within attachments to Goche's comments show as it was received).

2020 NEPA Scoping Comments



M. D. Edwards

██████████@comcast.net

Phone: 360 ██████████

U. S. Fish and Wildlife Service
c/o Marty Acker
510 Desmond Dr. SE, Suite 102
Lacey, WA 98503

October 26, 2020

Via: www.regulations.gov

Email: martin_acker@fws.gov

Re: Comments on Proposed Thurston County Habitat Conservation Plan
Document No. FWS-R1-ES-2020-0101

DIRECT POPULATION GROWTH INTO MUNICIPALITIES AND PRESERVE PROTECTED HABITAT

The U. S. Fish and Wildlife's "threatened" species declaration of April 2014 under the Endangered Species Act involving lands within Thurston County were implemented converse with accredited state and university studies. The declaration as applied to the Mazama pocket gopher has not been scientifically evidenced sufficiently to warrant protection and as such, should be delisted. Recent surveys have demonstrated growing numbers of gophers in portions of the county.

Thurston County's application for a Habitat Conservation Plan (HCP) to streamline local determinations for land-use permitting is essential to enable responsiveness to the public and minimize economic impacts of a number of listed species. The absence of an approved HCP in the last seven years has been extremely impactful economically. Due to the absence of a timely defined process, citizens of the county have been placed in an untenable position as to use of their lands and experienced frozen lifetime investments virtually without any defined practical path of resolve. This has resulted in unnecessary divisiveness between citizens and their government.

The HCP now under consideration should be designed to preserve natural resources of watersheds, prairie soils and rural environments of the county by encouraging development within municipalities. Population growth directed to cities and their urban growth areas under the state's Growth Management Act would provide in-place administration of the State Environmental Policy Act and utilize existing infrastructures of roads, water and sewer. Accommodating growth within municipalities by removing or greatly reducing regulation and mitigation on lands in their service areas would diminish development pressure in rural areas, thus better preserving prairie habitat, the natural aesthetics of the county and guard against urban sprawl.

/s/

M. D. Edwards
Thurston County Property Owner
Former President and Board Member, Economic Development Council of Thurston County



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Submitted Electronically via eRulemaking Portal

Posted by the **Fish and Wildlife Service** on Oct 28, 2020

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Comment

I recommend we do not permit the incidental take so as to better protect the environment and delicate species.

Comment ID

FWS-R1-ES-2020-0101-0005



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1k4-9js0-ncls

Comment Details

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Document Subtype

Comment(s)

Received Date

Oct 27, 2020

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A Washington State Chapter of the National Audubon Society
P.O. Box 2524, Olympia, WA 98507
(360) 352-7299 www.blackhills-audubon.org

Black Hills Audubon Society is a volunteer, non-profit organization of more than 1,300 members in Thurston, Mason, and Lewis Counties whose goals are to promote environmental education and protect our ecosystems for future generations.

November 15, 2020

To: U.S. Fish and Wildlife Service (USFWS) and Thurston County, WA

From: Elizabeth Rodrick, Vice President, Black Hills Audubon Society, P.O. Box 2524, Olympia, WA 98507, [REDACTED]@gmail.com, 360-[REDACTED]

Nada Culver, Vice President, Public Lands and Senior Policy Counsel,
National Audubon Society, 1580 Lincoln St, Ste 1280, Denver, CO 80203,
[REDACTED]@audubon.org, 303-[REDACTED] (c), 720-[REDACTED] x [REDACTED] (o)

Subject: **Scoping Comments for EIS on Thurston County Prairie Habitat Conservation Plan (HCP), pertaining to NEPA FWS-R1-ES-2020-0101-0001 and SEPA**

These comments are submitted on behalf of Black Hills Audubon Society (BHAS). BHAS is a chapter of the National Audubon Society, representing Lewis, Mason and Thurston counties in the state of Washington. It is a volunteer-based, non-profit organization whose 1,300+ members share interests in birds and other wildlife, their habitats, and natural history. Our goals are to promote environmental education and recreation and to maintain and protect our ecosystems for future generations.

Significance

The prairies of western Washington developed some 10,000 years ago, after the last glaciation. Today, our native prairies are one of the most endangered ecosystems in the United States. Once covering 150,000 acres, more than 90% of the historic prairie and savanna has been converted to agriculture or lost to urban development or the encroachment of coniferous forest. These threats remain and only a small portion of the original prairie is protected in parks or reserves.

BHAS members regularly lead field trips and educational programs, and participate in habitat restoration and protection projects to conserve South Puget Sound prairies and their associated wildlife including the four endangered and threatened species covered by the HCP, the Mazama Pocket Gopher (3 subspecies), Oregon Spotted Frog, Oregon Vesper Sparrow, and the Taylor's Checkerspot Butterfly. The proposed take of these species and development of their habitats will not only diminish our enjoyment and appreciation of these animals and ecosystems but may deprive future generations of this opportunity as well.

With projected population growth and climate change, many private lands will be developed and existing reserves will be impacted. The three subspecies of Mazama Pocket Gopher covered by the HCP occur only in Thurston County, WA and nowhere else in the world. The small, isolated populations of these species are on the brink of extinction.

The 1:1 mitigation of functional acres proposed in the HCP is not adequate when endangered and threatened species are impacted. Greater permanent habitat protection is needed to protect and restore functioning ecosystems and viable populations.

For these reasons, BHAS supports Alternative 3, Modified Mitigation for the Highest Conservation Benefit.

Problems with USFWS Conducting Scoping Process under the 2020 NEPA Rule

The USFWS decision to conduct the Thurston County HCP DEIS scoping process pursuant to the 2020 NEPA Rule—despite ongoing legal challenges to the Rule’s validity—threatens to undermine both public participation and agency decision making in the NEPA process. Any alternatives submitted by the public beyond the scoping period may not be considered by the agency. In addition, the agency will not be required to consider cumulative or indirect impacts on the environment, e.g. climate change. The USFWS should conduct the HCP DEIS process under the 1978 NEPA regulations in order to meet NEPA’s statutory mandate.

Include New Species Information

The HCP DEIS should use the best available science and include any new information that has appeared since the HCP was written. The most recent science reference is 2017. An important new publication is the 2020 Mazama Pocket Gopher Recovery Plan and Status Review, cited below.

Climate Impacts Should be Considered

The HCP should consider the impacts of climate change on the covered species. The stresses and instability associated with climate change are predicted to have greater impact on small isolated populations. For example, increased fire frequency or severity could adversely impact pocket gophers and their preferred forage plants and drier soil moisture conditions may make burrowing more challenging.

The Oregon Spotted Frog is rated as having moderate to high vulnerability to climate change. Potential warmer and drier conditions could lead to alterations in or disappearance of shallow ponds and changes in vegetation, which could impact breeding and tadpole survival. Additionally, warmer temperatures could lead to increases in invasive warm water predators that prey upon Oregon Spotted Frogs, like American Bullfrogs and some invasive fish species, thus leading to potential population declines.

Include Mining as Covered Activity

Thurston County issues permits for mining and therefore should cover this activity in the HCP. The update to the Thurston County Comprehensive Land Use Plan proposes to designate 144,000 acres as mineral lands, open to mining. The county should account for and avoid or mitigate the substantial harm that mining could cause to species covered by the HCP.

Some Mazama Pocket Gopher habitat is located on deep glacial outwash gravels that could be mined. Past gravel extraction eliminated gophers at several sites.

Because the Oregon Spotted Frog resides solely in water for each of its life stages, its survival is directly tied to a year-to-year recurring hydrologic pattern. Mining-related water level impacts may occur rapidly or gradually, depending on the rate of excavation and/or the hydrologic conditions encountered during excavation. Changes in spring water levels could drive the frog from its present oviposition sites. Future mining excavation should be highly scrutinized for impacts to water conditions, habitat, and frog recovery efforts.

Consider Impacts to Historic and Cultural Resources

The Draft Appendix A: HCP Outreach Summary does not include any special outreach to the sovereign local Coast Salish Tribes. The tribes depended on and cared for the prairies for thousands of years before European colonization. The prairie resources including game animals and the camas root were essential to their subsistence. The HCP should include their traditional ecological knowledge and recognize the historic and cultural significance of the prairie habitats. We urge you to engage in meaningful consultation with representatives of the Tribes in preparation of the HCP.

Monitoring and Adaptive Management

In order to offset the impacts of the taking, the HCP relies heavily on coordination, cooperation, and funding of other agencies and organizations. Funding for monitoring and adaptive management is unpredictable, often the first to go with budget cuts. The HCP's approach to adaptive management must account for challenges in funding and commit to restricting permitted activities unless they can be sufficiently monitored and management adjusted as needed.

References:

Stinson, D. W. 2020. Mazama Pocket Gopher Recovery Plan and Periodic Status Review. Washington Department of Fish and Wildlife, Olympia. 102+vii pp.

June 20, 2018. Memo to Black Hills Audubon Society From: James T. Mathieu, LG, LHg, Northwest Land & Water, Inc. Water Level Monitoring at West Rocky Prairie, April 2012 – October 2017

Washington Department of Fish and Wildlife. 2015. Washington's State Wildlife Action Plan: 2015 Update. Washington Department of Fish and Wildlife, Olympia, Washington, USA.

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Comment from Davis, Gregory

Posted by the **Fish and Wildlife Service** on Nov 12, 2020

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Comment

This is a plan that the county needs desperately. Otherwise there can be no construction on county or private lands under the endangered species act. I urge to approve this action by the County. IT JUST MAKES SENCE. The only way out is to establish land where the endangered species will not be harmed and allowed to increase population.

Comment ID

FWS-R1-ES-2020-0101-0008



Tracking Number

khg-9g0m-tbgy

Comment Details

Submitter Info

Submitter Name

Gregory Davis

City

Yelm

Country

United States

State or Province

WA

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November 13, 2020

Marty Acker, HCP, NEPA, ESA Ecologist
U.S. Fish and Wildlife Service
510 Desmond Dr. SE, Suite 102
Lacey, WA 98503

Dear Mr. Acker:

This letter is to convey Puget Sound Energy's (PSE) remarks regarding the U.S. Fish & Wildlife Service (USFWS) - Notice of Intent to prepare an Environmental Impact Statement for the Thurston County Habitat Conservation Plan (HCP). This letter is submitted for integration under the National Environmental Policy Act (NEPA) public scoping document (i.e., Docket No. FWS-R1-ES-2020-0101) as well as under the Washington State Environmental Policy Act (SEPA).

PSE has received approval from USFWS regarding its HCP issued under Permit TE81283D-0. This permit is effective September 21, 2020 through September 21, 2025. It is essential to ensure consistency and compatibility with PSE's permitted HCP and the final HCP permit issued to Thurston County. This includes covered activities; avoidance and minimization measures (best management practices); and mitigation measures (conservation).

PSE provides electric and natural gas facilities and services throughout Thurston County. The EIS should provide language addressing the County's proposed population growth and land development activities for the 30-year period proposed for the HCP. Since PSE is required to provide facilities and services to address these growth activities, they should be addressed and covered by the Thurston County HCP.

The EIS should consider the total project impacts that may occur outside of Thurston County's defined project scopes. As part of its obligations within its franchise with Thurston County, PSE is required to relocate its natural gas and/or electric facilities and services if they are in conflict with proposed transportation and capital improvements constructed by Thurston County.

Marty Acker
November 13, 2020
Page Two

This includes maintenance activities. These activities take place in the right-of-way but may also include private property that may result in temporary or permanent impacts. The activities may also include utility work associated with electric substations, distribution and transmission lines; natural gas mains and gate stations.

PSE supports Alternative 2 presented in the NEPA/SEPA Scoping Document for the Thurston County HCP, dated October 26, 2020.

We look forward to working with USFWS and Thurston County during the development of the EIS and final proposed HCP. Should there be any questions regarding these preliminary comments, please do not hesitate to contact me at [REDACTED]@pse.com or (206) [REDACTED]. Thank you.

Cordially,

Amy L. Tousley

Amy L. Tousley
Senior Municipal Liaison Manager

Cc: Christina Chaput, Thurston County Planning and Economic Development
Joshua Cummings, Thurston County Planning and Economic Development
Jennifer Walker, Thurston County Public Works
Jessica Jackson, PSE Land Planning

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Please consider comments from the South Sound Sierra Club Group uploaded.

"The FWS's decision to conduct the Thurston County draft EIS scoping process pursuant to the 2020 NEPA Rule despite ongoing legal challenges to the Rule's validity threatens to undermine both public participation and agency decision making in the NEPA process. Given the numerous legal challenges to the 2020 NEPA Rule, relying on it also potentially wastes significant agency resources. The FWS should exercise its discretion and conduct the Thurston County draft EIS process under the 1978 NEPA regulations."

Respectfully,

Phyllis Farrell, Chair
South Sound Sierra Club Group

Attachments 1



HCPItrBOCC11.15.20



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Comment ID

FWS-R1-ES-2020-0101-0011



Tracking Number

1k4-9k43-gckv

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Submitter Info

Submitter Name

Phyllis Farrell

City

Olympia

Country

United States

State or Province

WA

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November 15, 2020

Thurston County Board of County Commissioners
2000 Lakeridge Dr. SW
Olympia, WA 98502

Gentlemen:

The South Sound Sierra Club Group, representing over 1400 members and supporters in Thurston County, has the following questions and concerns regarding the draft Habitat Conservation Plan (HCP).

The goal of the HCP is to protect the habitat of the four Endangered Species Act (ESA) species and to ensure the long-term survival of the species while providing a regulatory plan for private and commercial development. Does the Plan provide for additional ESA listings?

We question whether the draft plan of 1:1 mitigation will adequately protect enough habitat for the long term. While the umbrella plan will

The Plan also does not adequately address the climate change projections on habitat. Changes in rainfall may require additional habitat beyond 1:1 mitigation to ensure long term survival.

And, we question the undue tax burden on the public for mitigation for private and public development on endangered habitat.

The draft Mineral Lands Review greatly expands the amount of mineral lands available for mining, especially in pocket gopher habitat. Additional mitigation requirements should be specified for mining operations.

The Plan specifies the County will be responsible for implementation, monitoring and enforcement with an annual review. It does not specify adequate County monitoring and enforcement requirements; County staff is already overburdened. What metrics will be used?

The South Sound Sierra Club Group urges the County to adopt an **improved** Alternative 3: Modified Mitigation for highest conservation benefit. Additionally, we ask the County and USFWS to address the concerns listed above.

Respectfully,

Phyllis Farrell, Chair
South Sound Sierra Club Group
[REDACTED]@hotmail.com

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Comment from Yake, Bill

Posted by the **Fish and Wildlife Service** on Nov 16, 2020

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Comment

November 16, 2020

Fish and Wildlife Service Headquarters

MS: PRB/3W

5275 Leesburg Pike

Falls Church, VA 22041–3803

RE: Docket No. FWS–R1– ES–2020–0101: Notice of Intent to Prepare a Draft Environmental Impact Statement for the Thurston County Habitat Conservation Plan in Thurston County, Washington

I write to provide comments on the Fish and Wildlife Service's (FWS) Notice of Intent to Prepare a Draft Environmental Impact Statement for the Thurston County Habitat Conservation Plan (HCP) in Thurston County, Washington.

Thurston County has applied for an Incidental Take Permit under the Endangered Species Act to allow further development of native South Sound Prairies in Thurston County. The South Sound Prairies are one of the most endangered ecosystems in the United States. More than 90% of these native prairies have been converted to agricultural, residential, or commercial uses. These prairies are home to many threatened and endangered species, including the Yelm pocket gopher, the Olympia pocket gopher, the Tenino pocket gopher, the Oregon spotted frog, the Vesper sparrow, the Streaked Horned Lark, as well as the Puget Blue and Taylor's checkerspot butterflies. These species rely on the habitat in the prairies for their survival. Issuing an Incidental Take Permit to allow the take of these species could well diminish my enjoyment and appreciation of these species and their ecosystems, and will make it more likely that future generations will not get to see our native prairies and the wildlife they have supported for thousands of years.

I am concerned that the FWS's NEPA process will not allow the opportunities for public participation that NEPA requires and will result in an incomplete analysis of the proposed project's environmental consequences. The FWS states that it will follow the Council on Environmental Quality's updated National Environmental Policy Act regulations (2020 NEPA Rule) in creating the draft EIS for the Thurston County HCP, even though the 2020 NEPA Rule is the subject of multiple legal challenges. I am concerned that by following 2020 NEPA Rule, the FWS's scoping process will substantially limit my ability to participate in the Thurston County HCP NEPA process through public comment and the draft EIS may fail to consider many

of the project's critical environmental impacts.

I am particularly concerned that the FWS's decision to follow the 2020 Rule for the Thurston County HCP draft EIS constrains my ability to submit alternatives to the proposed project. The 2020 Rule states that the agency is not required to consider comments that are submitted outside a designated comment period. Since the 2020 Rule requires that agencies request comments on alternatives during the scoping phase (even before the issuance of a draft EIS), the agency may not consider comments proposing alternatives submitted after the issuance of a draft EIS. Thus, the new Rule appears to significantly limit the range of alternatives that an agency might consider throughout the NEPA process. As a concerned member of the public, the 2020 NEPA Rule leaves me with two unsatisfying choices: either submit alternatives before I know the extent of the proposed project's environmental consequences, or risk waiving my right to have alternatives considered by the agency. Neither option provides the sort of robust public participation that NEPA contemplates.

I am also concerned that, by following the 2020 NEPA Rule, the Thurston County HCP draft EIS will fail to consider many of the relevant environmental impacts of issuing an incidental take permit because the 2020 Rule removes the requirement that the lead agency consider indirect or cumulative impacts. If agencies are no longer required to consider indirect or cumulative impacts, agencies cannot fulfill NEPA's mandate of reasoned decision making, because any final decision would necessarily ignore context necessary to understanding a proposal's holistic impact on the environment.

The Thurston County HCP will cover a significant portion of Thurston County, and could result in the loss of many species protected by the federal Endangered Species Act. A species, once gone, cannot be brought back; this kind of irreversible consequence is exactly the kind of major environmental impact contemplated by NEPA. I am concerned about the loss of these species and about what the loss of these species will do to destabilize our ecosystem. As such, it is vitally important that members of the public be able to provide thorough, reasoned alternatives to the proposed project. It is also crucial that the agency consider all potential impacts that the plan could have on the surrounding environment. For these reasons, I strongly oppose the FWS's plan to conduct the Thurston County HCP NEPA process consistent with the 2020 NEPA Rules.

Dated November 16, 2020

Comment ID

FWS-R1-ES-2020-0101-0019

**Tracking Number**

khl-2t63-vj2f

Comment Details**Submitter Info****Submitter Name**

Bill Yake

City

Olympia WA

Country

United States

State or Province

WA

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The EIS should address cumulative effects (mostly positive) for the covered species as a result of this HCP, plus current and reasonably foreseeable regional conservation programs. These include:

Tumwater/Port of Olympia HCP

Kaufmann HCP

past and current JBLM Army Compatible Use Buffer programs

US Fish and Wildlife Service Section 6 grants

Washington Department of Wildlife species recovery plans and Wildlife Areas

Washington Department of Natural Resources Natural Area Preserves

Natural Resources Conservation Service agricultural easements and technical assistance under various Farm Bill programs

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Please protect the Mazama pocket gophers, the frogs, Taylor's checkerspot butterflies, and sparrows from harm. Thank you.

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FWS-R1-ES-2020-0101-0020



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1k4-9k4g-7g5v

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Submitter Name

Victoria Lopez



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Dear President Tiny Hands,

Wow, you're now down by more than 5.5 million votes. Biden flipped five states that you won in 2016. He beat you in electoral college votes by 306 to 232.

Have you ever stopped to consider that Americans despise you? Nah, I didn't think so. Simp.

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FWS-R1-ES-2020-0101-0012



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1k4-9k4e-svzx

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Anonymous Anonymous



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November 16, 2020

Fish and Wildlife Service Headquarters
MS: PRB/3W
5275 Leesburg Pike
Falls Church, VA 22041-3803

RE: Docket No. FWS-R1-ES-2020-0101: Notice of Intent to Prepare a Draft Environmental Impact Statement for the Thurston County Habitat Conservation Plan in Thurston County, Washington

I write to provide comments on the Fish and Wildlife Service's (FWS) *Notice of Intent to Prepare a Draft Environmental Impact Statement for the Thurston County Habitat Conservation Plan (HCP) in Thurston County, Washington*.

I live and recreate in Thurston County, and I have been a frequent visitor to the prairie landscapes subject to this HCP, including the Scatter Creek Wildlife Area.

Thurston County has applied for an Incidental Take Permit under the Endangered Species Act to allow further development of native South Sound Prairies in Thurston County. The South Sound Prairies are one of the most endangered ecosystems in the United States. More than 90% of these native prairies have been converted to agricultural, residential, or commercial uses. These prairies are home to many threatened and endangered species, including the Yelm pocket gopher, the Olympia pocket gopher, the Tenino pocket gopher, the Oregon spotted frog, the Vesper sparrow, and the Taylor's checkerspot butterfly. These species rely on the habitat in the prairies for their survival. Issuing an Incidental Take Permit to allow the take of these species will diminish my enjoyment and appreciation of these species and their ecosystems, and will make it more likely that future generations will not get to see and experience our native prairies and the wildlife they have supported for thousands of years.

I am concerned that the FWS's NEPA process will not allow the opportunities for public participation that NEPA requires and will result in an incomplete analysis of proposed development projects' environmental consequences. The FWS states that it will follow the Council on Environmental Quality's updated National Environmental Policy Act regulations (2020 NEPA Rule) in creating the draft EIS for the Thurston County HCP, even though the 2020 NEPA Rule is the subject of multiple legal challenges. I am concerned that by following 2020 NEPA Rule, the FWS's scoping process will substantially limit my ability to participate in the Thurston County HCP NEPA process through public comment and the draft EIS will fail to consider many of the critical environmental impacts resulting from development projects.

I am particularly concerned that the FWS's decision to follow the 2020 Rule for the Thurston County HCP draft EIS constrains my ability to submit alternatives to the proposed project. The 2020 Rule states that the agency is not required to consider comments that are submitted outside a designated comment period. Since the 2020 Rule requires that agencies

request comments on alternatives during the scoping phase (even before the issuance of a draft EIS), the agency may not consider comments proposing alternatives submitted after the issuance of a draft EIS. Thus, the new Rule appears to significantly limit the range of alternatives that an agency might consider throughout the NEPA process. As a concerned member of the public and resident of Thurston County, the 2020 NEPA Rule leaves me with two unsatisfying choices: either submit alternatives before I know the extent of the proposed project's environmental consequences, or risk waiving my right to have alternatives considered by the agency. Neither option provides the sort of robust public participation that NEPA contemplates.

I am also concerned that, by following the 2020 NEPA Rule, the Thurston County HCP draft EIS will fail to consider many of the relevant environmental impacts of issuing an incidental take permit because the 2020 Rule removes the requirement that the lead agency consider indirect or cumulative impacts. If agencies are no longer required to consider indirect or cumulative impacts, agencies cannot fulfill NEPA's mandate of reasoned decision making, because any final decision would necessarily ignore context necessary to understanding a proposal's holistic impact on the environment.

The Thurston County HCP will cover a significant portion of Thurston County, and could result in the loss of many species protected by the federal Endangered Species Act. A species, once gone, cannot be brought back; this kind of irreversible consequence is exactly the kind of major environmental impact contemplated by NEPA. I am concerned about the loss of these species and about what the loss of these species will do to destabilize our ecosystem. As such, it is vitally important that members of the public be able to provide thorough, reasoned alternatives to the proposed project. It is also crucial that the agency consider all potential impacts that the plan could have on the surrounding environment. For these reasons, I strongly oppose the FWS's plan to conduct the Thurston County HCP NEPA process consistent with the 2020 NEPA Rules.

Sincerely,

/s/

Kenneth M. Stone



State of Washington
Department of Fish and Wildlife

Mailing Address: 48 Devonshire Rd, Montesano, WA 98563, (360) 249-4628, TTY (800) 833-6388
Main Office Location: Natural Resources Building, 1111 Washington Street SE, Olympia WA 98501

November 16, 2020

U.S. Fish and Wildlife Service Headquarters
MS: PRB/3W
5275 Leesburg Pike
Falls Church, VA 22041-3803

RE: Docket No. FWS-R1-ES-2020-0101
ATTN: Marty Acker, USFWS Washington state Field Office

To Whom it May Concern:

The Washington Department of Fish and Wildlife (WDFW) is responsible for managing and conserving fish and wildlife resources in our state. In this letter, we offer our perspective related to the United States Fish and Wildlife Service's (USFWS) Notice of Intent to Prepare a Draft Environmental Impact Statement for the Thurston County Habitat Conservation Plan (HCP) in Thurston County, Washington. We appreciate the opportunity to comment on the process, criteria, and considerations for this HCP.

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Chehalis Basin Strategy Aquatic Species Restoration Plan

We encourage the USFWS to

We would also ask that the Service and Thurston County be more explicit in the take analysis and mitigation strategies when applying the Mazama Pocket Gopher 4(d) rule, especially in relation to take of the other species which may co-occur on gopher-suitable prairie soils. We recommend that the Service conduct analyses and

develop any final changes and associated guidance in close collaboration with WDFW to guide ESA implementation and decision-making in beneficial and effective ways for all co-managers of our state's natural resources.

Sincerely,

A handwritten signature in dark ink, appearing to read "Larry Phillips". The signature is fluid and cursive, with a large initial "L" and "P".

Larry Phillips, Regional Director
Washington Department of Fish and Wildlife

cc: Brad Thompson, Washington Field Office Director
Marty Acker, Washington Field Office

November 16, 2020



Public Comments Processing
Attn: Docket No. FWS-R1-ES-2020-0101
U.S. Fish and Wildlife Service Headquarters,
MS: PRB/3W 5275 Leesburg Pike Falls Church,
VA 22041-3803.
[Via <http://www.regulations.gov>]

SUBJECT: Thurston County HCP; Docket No. FWS-R1-ES-2020-0101

To whom it may concern:

Thank you for putting together an HCP for the Thurston County area. The Plan is an important step for protecting threatened and endangered species, and ensuring certainty for future development efforts.

LOTT Clean Water Alliance (LOTT) provides wastewater management services for the urban areas of Lacey, Olympia, and Tumwater in Thurston County. We treat wastewater from these urban areas, and also produce Class A Reclaimed Water that can be reused or reintroduced to the environment. Part of LOTT's long range capacity development plan is to produce more reclaimed water in the future and reintroduce the water to the environment through upland infiltration or surface water and wetland augmentation.

LOTT currently owns several properties in the County that may be suitable for future reclaimed water reintroduction. We are also exploring the need to acquire additional properties for this purpose. Suitable undeveloped sites are challenging to find, especially for infiltration. Soils conducive to infiltration share many characteristics with prairie soils and those that make good pocket gopher habitat. However, it may be feasible to develop future facilities in a manner that supports continued use of the site by gophers or other protected species.

As a regional utility that provides essential public services within the County, LOTT asks that development related to our future facilities be covered under the HCP section 3.1.9, Water Resources Management. These development activities could include installation of conveyance pipelines, development of surface or subsurface infiltration sites, or reintroduction of reclaimed water through surface water or wetland augmentation.

We respectfully ask that this change be made to the HCP to ensure that LOTT can meet the future wastewater management needs of our partner jurisdictions.

Sincerely,

A handwritten signature in blue ink that reads "Lisa Dennis-Perez". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Lisa Dennis-Perez
Environmental Planning & Communications Director

██████████ [@lottcleanwater.org](mailto:info@lottcleanwater.org) / 360-██████████

Because my family for generations has always cared for our land, we are not rewarded but penalized.

I live 2 miles se of Yelm on the land my grandparents bought in 1920. Grandpa was a gardener from Iowa, the land was chosen for the location, soil, and water (has a creek).

He sold berries, apples, plums, pears, strawberries, rhubarb & vegetables. They brought with them 2 cows and a bull; the herd grew to 300 head with 150 milking by the 1970s.

The farm was 165acres, I am 72 and spent my childhood walking this land, we chased the cows in daily. There were moles and probably gophers.

In 1992 after ecology made dairying so close to a creek impossible, we started to divide off some of the land for my mother and uncle (land is a farmer's retirement fund). The 12 lots were 1 acre clustered on a 40acre piece with the rest left open for farming.

I started noticing gophers in about 2008 after getting letters from the government wanting to survey our land to see if we have them (everyone I know said NO, thinking just one more way to take your land). The gopher mounds were mostly in the ditch, I thought maybe brought in with fill for the road along with the scotch broom and turnips, or maybe always been here, just fewer than the moles.

There are so many gophers now and a lot more in the yards of the homes than in the fields next to them. Maybe, the fact that the yards are maintained watered and planted, and not mainly in the ditch, but all over the yards along with the moles.

We have 5 lots that we haven't sold because of the gophers we pay tax of about \$1000 each per year along with the cost to develop and interest, this is a heavy financial burden for a rodent, every year the county says next year they will have a plan. Will we be compensated or fined for having rodents?

Just watch the hawks and coyotes they don't eat moles, but they are always after the gophers and mice. Gophers are not endangered. Maybe if you are rewarded for having gophers instead of being penalized there would be a lot more gophers.

Sincerely,

Charlotte Zinski



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Submitted Electronically via eRulemaking Portal

Posted by the **Fish and Wildlife Service** on Oct 29, 2020

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As a REALTOR Living in this community, I support the Current Plan that is presented by Thurston County. I think we as a community worked hard to solidify the plan that works for everyone. This plan has balanced elements for protection of species and not to completely stop the necessary growth of our county and economy. I recommend that FWS accept the Thurston county's HCP as presented

Comment ID

FWS-R1-ES-2020-0101-0006



Tracking Number

1k4-9jt5-417r

Comment Details

Submitter Info

Submitter Name

Mark Kitabyaashi

City

Olympia

Country

United States

State or Province

WA

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protecting the speies liste is fine. all species shoudl be protected in thurston county hcp. no waiveers to kill shoudl ever be allowed to be processed. they shoudl all be denied totally and permanently. all species are under attack in america by profiteer/predator human scum. the animals have no real protection from such human scum who exist to kill and murder for money or fun at killing. turn them down.

Comment ID

FWS-R1-ES-2020-0101-0002



Tracking Number

1k4-9jjw-z470

Comment Details

Submitter Info

Submitter Name

jean publieee



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You ask how the gopher restrictions have affected people financially.

In 1994 after it became too difficult to have a dairy on the land because of the new farming restrictions, we decided to sell a bit of land, for income, keep a few cows and sell hay.

We had to convert irrigation rights to residential to serve 51 homes, then survey the land, design the lots (we chose the cluster design to keep as much land still open in farming as possible) winter study, septic designs, put in water system and road, and work through the county system, so by 2000 we were approved. 12 building sites of an acre to an acre and a half the rest open space. Not an inexpensive process, for which we borrowed.

We sold 4 lots and started on the next 40 acres the same way 12 lots (design, septic, road) it was completed in 2005 wasn't approved until 2010 because we were required to bring the water system from a B that serves 14 home to an A system (after the A was approved it the state then had us operate as a B system), through this time frame the recession hit land hard, lots that were selling for over \$100,000 now had few offers of \$30,000.

Now gophers. (We had survived by refinancing and dumping all our retirement into the land even at that we were luckier than a lot who lost their land). We went to the meetings spoke our piece to no avail, gopher (the pest the farm stores still sell poison for) were said to be threatened.

So, yes gophers have impacted us financially, our accountant said 4 years ago that any lot we sell for less than \$120,000 we get to deduct as a loss.

Not only are the 5 remaining building sites affected but also the 120 acres open land. To top it off while not being able to sell we pay property tax of about \$1,000 a year per lot and plenty more on the acreage.

This land that has been in our family since 1920, is our retirement, our 401k, now held hostage by rodents.

Take these rodents off the threatened list, the landowners are more threatened.
Charlotte Zinski

Comment ID

FWS-R1-ES-2020-0101-0007



Tracking Number

1k4-9jwe-zju8

Comment Details

Submitter Info

Submitter Name

Charlotte Zinski

City

yelm

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United States

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WA

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November 16, 2020

Fish and Wildlife Service Headquarters
MS: PRB/3W
5275 Leesburg Pike
Falls Church, VA 22041–3803

RE: Docket No. FWS–R1– ES–2020–0101
Scoping Comments for Notice of Intent to Prepare a Draft Environmental Impact Statement for the Thurston County Habitat Conservation Plan in Thurston County, Washington

This letter provides comments of the Natural Resources Defense Council (NRDC), National Audubon Society, and the Black Hills Audubon Society on **the FWS’s** Notice of Intent to Prepare a Draft Environmental Impact Statement for the Thurston County Habitat Conservation Plan in Thurston County, Washington. See 85 Fed. Reg. 65861 (Oct. 16, 2020). We appreciate the opportunity to comment.

I. Project Background

The South Sound prairies developed nearly 10,000 years ago, after the last glacial retreat. Today, these native prairies, including the prairies of Thurston County, Washington, are one of the most endangered ecosystems in the United States. More than 90% of the historic 150,000 acres of prairies and savannas have been converted to agricultural, residential, or commercial uses.

The U.S. Fish and Wildlife Service (FWS) intends to prepare an environmental impact statement (EIS) to evaluate the environmental impacts of an application from Thurston County for an incidental take permit under the Endangered Species Act. Thurston County intends to implement the Thurston County Habitat Conservation Plan (HCP) to cover a variety of activities, including road construction, agricultural development, and the construction and maintenance of county-owned or county-managed infrastructure. These activities could result in the taking of a number of federally protected threatened and endangered species, including the Yelm pocket gopher, the Olympia pocket gopher, the Tenino pocket gopher, the Oregon spotted frog, the Vesper Sparrow, and **the Taylor’s checkerspot** butterfly.

II. By conducting the scoping process for the Thurston County HCP EIS **pursuant to the Council on Environmental Quality’s 2020 NEPA Rule**, FWS will fail to effectuate the statutory purpose and goals of NEPA.

The FWS has stated that it will create the draft EIS for the Thurston County HCP pursuant to the updated regulations implementing NEPA (**the “2020 NEPA Rule”**) that

NATURAL RESOURCES DEFENSE COUNCIL

111 SUTTER STREET | FLOOR 21 | SAN FRANCISCO, CA | 94104 | T 415.875.6100 | NRDC.ORG

the Council on Environmental Quality (CEQ) issued on July 16, 2020.¹ The unlawful 2020 NEPA Rule is already the subject of multiple legal challenges, including one by NRDC. *Env'tl. Justice Health All. v. CEQ*, No. 20-cv-6143 (S.D.N.Y. filed August 6, 2020); *see also Wild Va. v. CEQ*, 3:20-cv-00045 (W.D.Va. filed July 29, 2020); *Alaska Cmty. Action on Toxics v. CEQ*, No. 20-cv-5199 (N.D. Cal. filed July 29, 2020); *States of California et al. v. CEQ*, No. 3:20-cv-06057 (N.D.Cal. filed August 28, 2020); *Iowa Citizens for Cmty. Improvement v. CEQ*, 1:20-cv-2715 (D.D.C. filed September 23, 2020). **By following the CEQ's 2020 NEPA Rule, the FWS's scoping process will limit both public participation and the agency's ability to fully analyze the proposal's** environmental impacts and reasonable alternatives as NEPA mandates. Preparing the Thurston County draft EIS pursuant to the 2020 NEPA Rule ensures that the final EIS will fail to fully analyze the significant environmental impacts of the Thurston County HCP.

A. **NEPA's Purpose and Goals**

The National Environmental Policy Act (NEPA), originally enacted in 1970, establishes **"a broad national commitment to protecting and promoting environmental quality."**² To effectuate this commitment, NEPA requires that federal agencies consider the environmental impacts of their decisions through reasoned decision making and public participation.³ **Every federal agency must prepare a "detailed statement by the responsible official" regarding a proposed project's** environmental impacts. These statements can take two separate forms: an Environmental Assessment (EA) or an Environmental Impact Statement (EIS). The preparation of an EA or EIS helps ensure that agencies make fully informed decisions before embarking on projects that might have major environmental consequences.⁴

When an agency begins the process of preparing an EIS, it must initially issue a Notice of Intent to prepare a draft **EIS and conduct a "scoping process."**⁵ This scoping process lays the groundwork for the rest of the EIS process by defining the overall breadth of issues to be addressed by the agency, including the scope of the draft EIS, the timeline for completing the EIS, and potential resources that might be affected by the proposed project. The scoping process is one of the first instances in which the public can meaningfully engage with the NEPA process by suggesting particular issues that an agency should consider while conducting its EIS, thus ultimately helping to define the scope of the **agency's analysis**. By getting the issues that matter to people on the table at the beginning, an agency can focus time and energy where it makes a difference to those who care about and are affected by the agency's decision.

¹ 85 Fed. Reg. 43,304 (July 16, 2020).

² *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 348 (1989).

³ 42 U.S.C. § 4332.

⁴ *Id.*

⁵ 46 C.F.R. § 46.235

NEPA requires agencies to consider the cumulative and indirect impacts that a major federal action would have on the environment.⁶ Consideration of cumulative and indirect impacts prevents agencies from undertaking a major federal action without reasoned analysis of how such an action might have unintended, or indirect, consequences on the environment. As such, the requirement that agencies consider cumulative and indirect impacts prevents agencies from considering proposed projects in a silo and requires that agencies analyze actions within the larger environmental context.

B. The impact of **CEQ's** new 2020 NEPA Rule on the scoping process and consideration of cumulative and indirect impacts.

The **CEQ's** 2020 NEPA Rule sharply curtails the scoping process and the requirement to consider cumulative and indirect impacts. These changes directly harm **both the public's ability to meaningfully participate in the NEPA process** and the **agency's ability to make informed and reasoned decisions with** respect to proposed federal actions.

Under section 1500.3(b) of the 2020 Rule, the public must submit comments within the comment period provided by the agency. Failing to do so forfeits the comment as unexhausted. As such, because the 2020 Rule requires that agencies request comments on alternatives during the scoping phase, the new Rule could significantly limit the range of alternatives that an agency might consider throughout the NEPA process by artificially capping the **public's ability** to submit alternatives at the very beginning of the process. Often, alternatives do not become apparent until the overall scope of the project is defined, which can often occur after the scoping process. As such, the 2020 Rule appears to limit the **public's ability to meaningfully propose** alternatives by forcing the public to either (1) submit alternatives during the scoping process, without full information about the proposed project, or (2) forfeit their ability to suggest alternatives later on in the NEPA process. This choice, in turn, inhibits the **agency's ability to fulfill NEPA's requirement of reasoned decision making by limiting** the quality and quantity of information that agencies can consider.

Likewise, the 2020 Rule also removes the requirement that the lead agency consider indirect or cumulative impacts in its EIS. If agencies are no longer required to consider indirect or cumulative impacts, **agencies cannot fulfill NEPA's mandate of** reasoned decision making, because any final decision would necessarily ignore context necessary to understanding a proposals holistic impact on the environment.

⁶ 42 U.S.C. § 4332(2)(C); *Baltimore Gas & Elec. Co. v NRDC*, 462 U.S. 87, 106-07 (1983) (stating that "NEPA requires an EIS to disclose the significant health, socioeconomic and cumulative consequences of the environmental impact of a proposed action").

C. The effects of the 2020 NEPA Rule on the Thurston County HCP draft EIS.

Because the FWS has announced its intention to conduct the scoping process of the Thurston County HCP draft EIS pursuant to the 2020 NEPA Rule, any alternatives submitted by the public beyond the scoping period may not be considered by the agency. Moreover, the agency will not be required to consider cumulative or indirect impacts of **the HCP on the environment. As such, the FWS's scoping period will limit public participation and reasoned agency decision making, falling short of NEPA's statutory mandate.**

Under the 2020 NEPA Rule, the FWS may not be required to consider alternatives to the proposed Thurston County HCP if those alternatives were not submitted during the scoping period. But alternatives submitted during the scoping period cannot account for the full range of expected environmental impacts from the proposed HCP, because the agency has yet to consider **the HCP's** potential environmental impacts. The agency does not make that analysis available to the public, which it undertakes *after* the scoping process, until it publishes its draft EIS. Accordingly, interested members of the public, including NRDC members concerned about the preservation of threatened and endangered species at issue in this EIS, will not be able to offer meaningful alternatives to the Thurston County HCP during the scoping process. But, if these members wait to offer alternatives until after the draft EIS is published and the range of environmental impacts are known, these alternatives will not be considered by the FWS. As such, conducting the scoping process for the Thurston County HCP draft EIS under the 2020 NEPA Rule effectively precludes public participation by forcing members of the public to either submit alternatives based on incomplete information, or waive their right to have their alternatives considered by the FWS.

Likewise, by following the 2020 NEPA Rule, the FWS will not be able to engage in a complete analysis of environmental impacts and alternatives in its draft EIS, because alternatives proposed at the scoping stage—the only alternatives that the agency is likely required to consider pursuant to the 2020 NEPA Rule—will be based on an **incomplete understanding of the proposed HCP's environmental impacts. Moreover,** because the agency is not required to consider cumulative or indirect impacts under the **2020 NEPA Rule, the agency's ultimate analysis will not consider** the full range of impacts that the proposed HCP might have on the environment.

III. The FWS should exercise its discretion not to proceed under the 2020 NEPA Rule.

Agencies are not required to proceed under the 2020 NEPA Rule unless the NEPA review process began **after the Rule's September 14, 2020 effective date. Because** this **project predates the 2020 NEPA Rule's effective date, the FWS has** the discretion to, and should, proceed with its NEPA review under the 1978 NEPA regulations.

By applying the new rules, the FWS hinders both public participation and informed decisionmaking in the scoping and draft EIS process. Applying the regulations as they existed prior to the 2020 changes, however, would allow for members of the **public to submit alternatives informed by the agency's draft EIS, leading to more robust** participation by the public, and more thoughtful analysis by the agency of the full range of environmental impacts.

Moreover, the viability of the 2020 NEPA Rule is uncertain because of outstanding legal challenges. Multiple groups, including a coalition of plaintiffs represented by NRDC, have sued to vacate the 2020 NEPA Rule as arbitrary, capricious, contrary to law, and in excess of statutory authority in violation of the Administrative Procedure Act.⁷ Should a court vacate the Rule, the FWS would be required to restart the entire Thurston County HCP draft EIS process to ensure compliance with the 1978 NEPA regulations.

IV. Conclusion

The FWS's decision to conduct the Thurston County draft EIS scoping process pursuant to the 2020 NEPA Rule—despite ongoing legal challenges to the Rule's validity—threatens to undermine both public participation and agency decision making in the NEPA process. Given the numerous legal challenges to the 2020 NEPA Rule, relying on it also potentially wastes significant agency resources. The FWS should exercise its discretion and conduct the Thurston County draft EIS process under the 1978 NEPA regulations.

Dated: November 16, 2020

Natasha Geiling
Gonzalo E. Rodriguez
Natural Resources Defense Council

Nada Culver
National Audubon Society

Elizabeth Rodrick
Black Hills Audubon Society

⁷ See, e.g., *Env'tl. Justice Health All. v. CEQ*, No. 20-cv-6143 (S.D.N.Y. filed August 6, 2020); see also *Wild Va. v. CEQ*, 3:20-cv-00045 (W.D.Va. filed July 29, 2020); *Alaska Cmty. Action on Toxics v. CEQ*, No. 20-cv-5199 (N.D. Cal. filed July 29, 2020); *States of California et al. v. CEQ*, No. 3:20-cv-06057 (N.D. Cal. filed August 28, 2020); *Iowa Citizens for Cmty. Improvement v. CEQ*, 1:20-cv-2715 (D.D.C. filed September 23, 2020).



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Comment from Randall, Kirsten

Posted by the **Fish and Wildlife Service** on Nov 16, 2020

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November 16, 2020

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Falls Church, VA 22041-3803

RE: Docket No. FWS-R1-ES-2020-0101: Notice of Intent to Prepare a Draft Environmental Impact Statement for the Thurston County Habitat Conservation Plan in Thurston County, Washington

I write to provide comments on the Fish and Wildlife Service's (FWS) Notice of Intent to Prepare a Draft Environmental Impact Statement for the Thurston County Habitat Conservation Plan (HCP) in Thurston County, Washington.

Thurston County has applied for an Incidental Take Permit under the Endangered Species Act to allow further development of native South Sound Prairies in Thurston County. The South Sound Prairies are one of the most endangered ecosystems in the United States. More than 90% of these native prairies have been converted to agricultural, residential, or commercial uses. These prairies are home to many threatened and endangered species, including the Yelm pocket gopher, the Olympia pocket gopher, the Tenino pocket gopher, the Oregon spotted frog, the Vesper sparrow, and the Taylor's checkerspot butterfly. These species rely on the habitat in the prairies for their survival. Issuing an Incidental Take Permit to allow the take of these species will diminish my enjoyment and appreciation of these species and their ecosystems, and will make it more likely that future generations will not get to see our native prairies and

the wildlife they have supported for thousands of years.

I am concerned that the FWS's NEPA process will not allow the opportunities for public participation that NEPA requires and will result in an incomplete analysis of the proposed project's environmental consequences. The FWS states that it will follow the Council on Environmental Quality's updated National Environmental Policy Act regulations (2020 NEPA Rule) in creating the draft EIS for the Thurston County HCP, even though the 2020 NEPA Rule is the subject of multiple legal challenges. I am concerned that by following 2020 NEPA Rule, the FWS's scoping process will substantially limit my ability to participate in the Thurston County HCP NEPA process through public comment and the draft EIS will fail to consider many of the project's critical environmental impacts.

I am particularly concerned that the FWS's decision to follow the 2020 Rule for the Thurston County HCP draft EIS constrains my ability to submit alternatives to the proposed project. The 2020 Rule states that the agency is not required to consider comments that are submitted outside a designated comment period. Since the 2020 Rule requires that agencies request comments on alternatives during the scoping phase (even before the issuance of a draft EIS), the agency may not consider comments proposing alternatives submitted after the issuance of a draft EIS. Thus, the new Rule appears to significantly limit the range of alternatives that an agency might consider throughout the NEPA process. As a concerned member of the public, the 2020 NEPA Rule leaves me with two unsatisfying choices: either submit alternatives before I know the extent of the proposed project's environmental consequences, or risk waiving my right to have alternatives considered by the agency. Neither option provides the sort of robust public participation that NEPA contemplates.

I am also concerned that, by following the 2020 NEPA Rule, the Thurston County HCP draft EIS will fail to consider many of the relevant environmental impacts of issuing an incidental take permit because the 2020 Rule removes the requirement that the lead agency consider indirect or cumulative impacts. If agencies are no longer required to consider indirect or cumulative impacts, agencies cannot fulfill NEPA's mandate of reasoned decision making, because any final decision would necessarily ignore context necessary to understanding a proposal's holistic impact on the environment.

The Thurston County HCP will cover a significant portion of Thurston County, and could result in the loss of many species protected by the federal Endangered Species Act. A species, once gone, cannot be brought back; this kind of irreversible consequence is exactly the kind of major environmental impact contemplated by NEPA. I am concerned about the loss of these species and about what the loss of these species will do to destabilize our ecosystem. As such, it is vitally important that members of the public be able to provide thorough, reasoned alternatives to the proposed project. It is also crucial that the agency consider all potential impacts that the plan could have on the surrounding environment. For these reasons, I strongly oppose the FWS's plan to conduct the Thurston County HCP NEPA process consistent with the 2020 NEPA Rules.

Kirsten Randall,
Tacoma, WA

Dated November 16, 2020

Comment ID

FWS-R1-ES-2020-0101-0014



Tracking Number

khl-akqv-njj5

Comment Details

Submitter Info

Submitter Name

Kirsten Randall

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United States

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WA

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REGIONAL
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DIVISION

November 16, 2020

Marty Acker
U.S. Fish and Wildlife Service
Washington Fish and Wildlife Office
510 Desmond Drive SE, Suite 102
Lacey, Washington 98503

Dear Mr. Acker

The U.S. Environmental Protection Agency has reviewed the U.S. Fish and Wildlife Service's Notice of Intent to prepare an Environmental Impact Statement for the proposed Thurston County Habitat Conservation Plan in Thurston County, Washington (EPA Region 10 Project Number 20-0048-USFWS). Our comments are provided pursuant to our responsibilities under the National Environmental Policy Act and Section 309 of the Clean Air Act.

According to the NOI, the USFWS proposes to evaluate the potential environmental impacts associated with an authorization for incidental take of federally protected species during the Thurston County development activities in the next 30 years. The species would include the endangered Taylor's checkerspot butterfly, threatened Yelm pocket gopher, Olympia pocket gopher, Tenino pocket gopher, and Oregon spotted frog; and Oregon vesper sparrow which is under review for ESA listing. The activities that would impact these species include county-permitted development activities, and construction and maintenance of county-owned or county-managed infrastructure. The proposed Thurston County Habitat Conservation Plan would therefore be in support of the anticipated Incidental Take Permit issuance. After analysis of potential impacts from the proposed action, the USFWS will process the applicant's request for an ITP, then decide whether to grant, grant with conditions, or deny the ITP.

EPA appreciates the information provided in the NOI. In addition to issues and resources that would be analyzed in the EIS for the project, we offer the enclosed scoping comments to inform the USFWS of topics we believe are important to consider in the NEPA analysis for this project.

Thank you for the opportunity to comment of this project proposal early in the NEPA process. If you have questions about our comments, please contact the lead reviewer Theo Mbabaliye of my staff at (206) 553-6322 or at mbabaliye.theogene@epa.gov, or me at (206) 553-1778 or at pepple.karl@epa.gov

Sincerely,

A handwritten signature in cursive script that reads "Karl Pepple".

Karl Pepple, Acting Chief
Policy and Environmental Review Branch

**EPA Region 10 Scoping Comments on the proposed
Thurston County Habitat Conservation Plan
November 16, 2020**

Environmental effects

Because the project could impact natural resources in the analysis area, we recommend that any associated NEPA document include information on the potential impacts and any necessary mitigation measures to reduce or cancel those effects. This would involve the delineation and description of the affected environment or analysis area, indication of the impacted resources, and describing the nature of the impacts and mitigation measures to reduce them. We recommend that providing adequate information on the following topics would be helpful for decision makers and the public.

a) Water quality

Section 303(d) of the Clean Water Act requires the State of Washington and Tribes with EPA-approved Water Quality Standards to identify water bodies that do not meet WQS and to develop water quality restoration plans to meet established water quality criteria and associated beneficial uses. We recommend that the EIS include the following information:

- Impacted waters, the nature of the impacts, and specific pollutants likely to affect those waters;
- Water bodies potentially affected by the project that are listed on the State of Washington most current EPA-approved 303(d) list;
- Existing restoration and enhancement efforts for those waters, how the proposed project would coordinate with on-going protection efforts, and any mitigation measures implemented to avoid further degradation of impaired waters; and
- How the project would meet the antidegradation provisions of the CWA. The provisions prohibit degrading water quality within water bodies that are currently meeting WQS.

Because the CWA also requires any construction project resulting in the disturbance of one or more acres to have authorization under the construction storm water discharge permit for construction activities, please provide the following information in the EIS:

- Direct, indirect, and cumulative impacts from storm water discharges;
- How the project would meet the requirements of the National Pollutant Discharge Elimination System permit program under the CWA, including development of Storm Water Pollution Prevention Plans, reporting, and monitoring;
- Best management practices, erosion and sediment control, and other mitigation measures to minimize impacts;
- Considerations for zero or low impact development techniques in project design due to their potential to reduce storm water volumes, and mimic natural conditions. For example, consider avoiding and minimizing creation of new impervious surface and excavation; and
- Application of green construction and management practices, consistent with the federal “green” requirements and opportunities that may apply to design, operation, and maintenance of project-related facilities and equipment.

b) Aquatic resource impacts

Because activities authorized under the proposed HCP may impact aquatic resources in the planning area, we recommend including the following information in the NEPA document for the project:

- Description of all waters of the U.S., including navigable waters and wetlands that could be affected by the project alternatives;
- Maps showing water locations, pathways of alternative routes through the planning area, and waterbody crossings, and resources likely to be impacted by the crossings;
- Acreages and channel lengths, habitat types, values, and function of these waters;
- Whether the project would result in discharge of dredged or fill materials into surface waters of the United States. If so, a CWA §404 permit from the U.S. Army Corps of Engineers would be required for the project, and the EIS would need to describe this permit application process and recommended measures to protect aquatic resources from impacts resulting from the proposed project;
- Mitigation plans, including compensatory mitigation required under the CWA, to reduce impacts to surface waters of the U.S.; and
- Floodplain impacts and actions to be taken to minimize related impacts. See CWA §404 and Executive Order 11988, *Floodplain Management*.¹

c) *Solid waste, hazardous materials, and wastewater management*

As projects authorized under the proposed HCP may result in direct, indirect, and cumulative impacts due to use of hazardous and non-hazardous materials, we recommend that the EIS for the project address these impacts. During the projects' construction, hazardous materials such as compressed gas and petroleum products may be used and/or stored near communities. Although proper management of these materials is presumed to be safe, concerns remain about the possibility of accidents resulting in the release of hazardous materials to the environment. Therefore, we recommend that the EIS:

- Describe measures that would be taken to minimize the chances of accidental spills or release of pollutants in the environment, and emergency response measures that would be taken should an accident occur;
- Address the applicability of state and federal hazardous materials, pollution prevention, and solid waste requirements, and appropriate mitigation measures to prevent and minimize the generation of solid and hazardous materials; and
- Assess the need to prepare and implement a Spill Prevention, Control, and Countermeasure and provide information addressing this SPCC.²

Because of past and ongoing industrial uses of the analysis area, there is need for careful attention to potentially contaminated sites in the area and sites that are being or have been under environmental cleanup, pollution source control, and restoration work. To the extent that the projects may affect the sites, we recommend coordination with EPA, Washington State Department of Ecology, and other relevant entities to identify the sites and practices that would minimize impacts during implementation of the projects and other plans.

d) *Air quality impacts*

Because projects allowed under the HCP may result in impacts on air quality, we recommend that the EIS for the project include:

¹ <https://www.epa.gov/cwa-404/floodplain-management-executive-order-11988>

² https://www.epa.gov/sites/production/files/2014-04/documents/b_40cfr112.pdf

- A detailed discussion of ambient air conditions (baseline or existing conditions), National Ambient Air Quality Standards (NAAQS) and criteria pollutant non-attainment areas in the analysis area and vicinity, if applicable;
- Estimation of criteria pollutant emissions for the analysis area and discuss the timeframe for release of these emissions from construction through the lifespan of the proposed project. It would be helpful to specify all emission sources and quantify related emissions;
- Specific information about pollutants from mobile sources, stationary sources, and ground disturbance;
- A Construction Emissions Mitigation Plan that identifies actions to reduce diesel particulate, carbon monoxide, hydrocarbons, and oxides of nitrogen or NOx;
- Potential effects from air pollutants, including air toxics, to:
 - workers, ground crews, nearby residents, businesses;
 - sensitive receptor locations such as, schools, medical facilities, senior centers and residences, daycare centers, outdoor recreation areas (e.g., parks); and
- Mitigation measures to minimize the proposed project impacts to air quality.

e) Align conservation efforts with current landscape-level strategies

We support and encourage partnerships among federal, state, local, and non-governmental entities to strategically and collaboratively conserve, restore, and maintain aquatic and wetland habitat. We recommend that strategic efforts include the following:

- Establish conservation banks;
- Focus efforts using existing maps of current and historic prairie/oak woodland habitats;
- Identify and prioritize the largest, most intact habitat patches;
- Identify and establish corridors/connections between and among habitat patches;
- Provide redundancy of habitats in the landscape;
- Identify and protect important refugia and biodiversity hotspots for prairie/oak woodland dependent plant and animal species;
- Restore degraded habitats, particularly those with the greatest potential for restoration and for meeting landscape-level conservation strategies;
- Seek to complement, augment, and connect with the important conservation work occurring on Joint Base Lewis-McChord;
- Seek management agreements with landowners of working lands that contain remnant and/or high quality habitat, such as lands grazed by livestock;
- Consider land exchanges;
- Include a full spectrum of habitats and species, both wet prairies and drier upland prairie/oak woodland habitats;
- Enable and implement species re-introductions in viable locations/habitats;
- Conduct salvage of plants, propagules, and prairie soils where remnant habitats are to be developed;

- Ensure that prairie restoration/management actions are socially and ecologically sensitive with respect to short and long-term direct, indirect, and/or cumulative effects. Avoid the use of chemicals if possible; and
- Provide incentives to landowners to retain and maintain prairie habitats and to have compatible land uses.

f) Threatened and endangered species

In addition to the ITP covered species, we recommend that the EIS identify impacts to other endangered, threatened, or candidate species listed under the Endangered Species Act, state sensitive species, and their habitats (including critical habitat) occurring in the analysis area. Please also include information on how the proposed project will meet all requirements under ESA, including consultation with National Oceanographic Atmospheric Administration – Fisheries.

g) Cumulative effects

We recommend that the EIS analysis consider evaluation of impacts over the entire area of impact and consider the effects of projects under the HCP when added to other past, present, and reasonably foreseeable future projects in the analysis area. Considering all the actions in this area together would help decision makers to understand more clearly what the cumulative impacts on environmental resources are likely to be. The EPA has issued guidance on how to provide comments on the assessment of cumulative impacts, *Consideration of Cumulative Impacts in EPA Review of NEPA Documents*.³ The guidance states that to assess the adequacy of the cumulative impact assessment, there are five key areas to consider:

- Resources, if any, that are being cumulatively impacted;
- Appropriate geographic area and the time over which the effects have occurred and will occur;
- All past, present, and reasonably foreseeable future actions that have affected, are affecting, or would affect resources of concern;
- A benchmark or baseline; and
- Scientifically defensible threshold levels.

Climate adaptation

The EPA recommends that the EIS include a discussion of reasonably foreseeable effects that changes in the climate may have on the proposed program and the program area. This could help inform the development of measures to improve the resilience of the program. If projected changes could notably exacerbate the environmental impacts of the program, the EPA recommends these impacts also be considered as part of the NEPA analysis.

Coordination with land use planning activities

We recommend that the EIS discuss how the proposed project would support or conflict with the objectives of federal, state, tribal or local land use plans, policies and controls in the analysis area and vicinity. Additionally, we recommend that the document address existing constraints in the analysis area (e.g., utility right-of-ways, floodplains) and how proposed land uses would be consistent and compatible with other land uses and identify any needed construction and operating permits and licenses.

³ <https://www.epa.gov/sites/production/files/2014-08/documents/cumulative.pdf>

Public involvement in project planning and implementation

As the proposed project may be of interest to a variety of stakeholders in the planning area, we recommend that the EIS development for the project disclose the efforts undertaken to ensure effective public participation in the scoping process and throughout the NEPA analysis process. For more information on effective public participation in the NEPA process, please consult the following resources:

- *The Citizen's Guide to the National Environmental Policy Act*;⁴ and
- *Community Guide to Environmental Justice and NEPA Methods*.⁵

Coordination with tribal governments

We recommend the EIS describe the process and outcome of government-to-government consultation between USFWS and each of the tribal governments that would be affected by the project, issues that were raised, if any, and how those issues were addressed. See Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*.⁶

Monitoring and Adaptive Management

We recommend that the proposed action include a monitoring program designed to assess implementation of the HCP over time to measure the effectiveness of the HCP in achieving conservation goals and other positive or negative effects that may occur. We also recommend that the DEIS describe a mechanism to consider and implement additional mitigation measures. In addition, the adaptive management and monitoring plan in the EIS may include the following elements:

- Establish how current analysis in the project area has been or will be done, and how this analysis will inform monitoring priorities;
- Lay out monitoring questions that will be used to inform the adaptive management process.
- Define how success will be measured;
- Provide information to determine whether management direction is being followed, whether desired results are being achieved, and whether underlying assumptions are valid;
- Be as specific as possible about who is the responsible decisionmaker at critical steps of the monitoring plan;
- Evaluate monitoring strategies periodically to determine if questions and protocols are still relevant and if changes are needed;
- Monitor changes in watershed condition; and
- Continue evaluating new science and technology to update monitoring strategies to improve quality and efficiency.

⁴ https://ceq.doe.gov/get-involved/citizens_guide_to_nepa.html

⁵ <https://www.energy.gov/sites/prod/files/2019/05/f63/NEPA%20Community%20Guide%202019.pdf>

⁶ https://www.energy.gov/sites/prod/files/nepapub/nepa_documents/RedDont/Req-EO13175tribgovt.pdf

Re: [EXTERNAL] RE: USFWS Thurston County, WA EIS/HCP

From: Mbabaliye, Theogene <Mbabaliye.Theogene@epa.gov>
Sent: Thursday, December 17, 2020 10:01 AM
To: Blackburn, Scott G <scott_blackburn@fws.gov>
Cc: Pepple, Karl <Pepple.Karl@epa.gov>
Subject: [EXTERNAL] RE: USFWS Thurston County, WA EIS/HCP

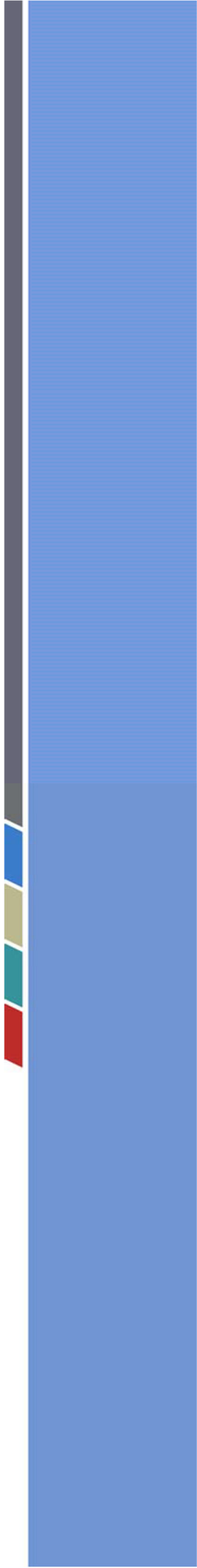
<p>This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.</p>
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Hello Scott and thank you so much for reaching out to us regarding our scoping comments letter on the subject EIS project. I just called you to discuss your Region concern over cumulative effects language in the letter, but missed you and I left you a message. As a follow up to that, please note that our scoping comments are meant for your consideration. Also, please know that the term cumulative effects has been replaced by “effects” defined as *those that are reasonably foreseeable, related to the proposed action under consideration, and subject to the agency’s jurisdiction and control*. As you technically assess those effects for the planned EIS analysis, you may find our scoping comments on the topic as a helpful framework and if not, you can simply disregard them and follow the language in the new NEPA regulations and your agency’s guide. Hopefully, this message answers your question. If not, please do not hesitate to contact us again for more clarifications.

Sincerely,

Theo Mbabaliye, Ph.D.
USEPA Region 10
Regional Administrator's Division (RAD)
Policy & Environmental Review Branch (PERB)
1200 6th Ave., Suite 155, 14-D12
Seattle, WA 98101-3140
Phone: (206) [REDACTED]

2020 SEPA Scoping Comments





THURSTON COUNTY
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NOV 05 2020
DEVELOPMENT SERVICES



PUBLIC WORKS
An Accredited Agency of the
American Public Works Association

COUNTY COMMISSIONERS

John Hutchings
District One
Gary Edwards
District Two
Tye Menser
District Three

Jennifer D. Walker, Director

November 5, 2020

Community Planning and Economic Development Department
Attention: Christina Chaput, Senior Planner
Thurston County Courthouse, Building 1
2000 Lakeridge Drive SW
Olympia, WA 98502

RE: Thurston County Draft Habitat Conservation Plan - Comments from Thurston County Public Works

Dear Ms. Chaput:

Thurston County Public Works commends Thurston County Planning and Economic Development Department (CPED) on reaching the milestone of completing the Draft Thurston County Habitat Conservation Plan (HCP) and fully supports CPED in this effort. When approved, the HCP will be a valuable tool that will help streamline the environmental review of Public Works projects resulting in a faster and more efficient project delivery system that provides important environmental protections.

The HCP will give Public Works the ability to determine the amount of mitigation or identify what conservation measures will be required early in the planning process. Knowing these requirements can greatly streamline the environmental permitting process.

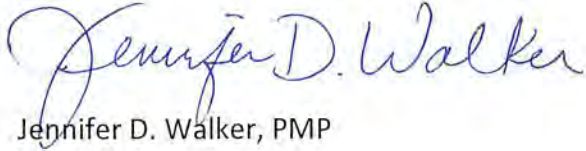
Incorporating active mitigation banks into the plan will eliminate one of the key obstacles that delay projects from proceeding to construction. The US Fish and Wildlife Service (USFW) process still requires the project proponent to find a suitable USFW approved habitat site before a project may proceed to construction. This is particularly true when consulting on Mazama Pocket Gopher. Having established habitat banks will provide protection for the species and still provide a path to construction.

Public Works provided input throughout the development of the HCP process, incorporating many of the Maintenance, Safety & Capital construction practices used daily. The HCP incorporates common field practices and considers future projects that will require ESA consultations, and it provides consistent guidance when working with ESA listed species within construction zones. The HCP will be regularly used and referenced by Public Works.

9605 Tilley Road S., Suite C – Olympia, WA 98512-1093 – (360) 867-2300 – FAX (360) 867-2291
TDD line: 711 or 1-800-833-6388

Public Works looks forward to the future approval of the final document and the future habitat banking the plan will establish. This effort will provide Public Works and the constituents of Thurston County a path forward for Thurston County's future maintenance and construction endeavors balanced with the need to protect threatened or endangered species under the Endangered Species Act (ESA).

Sincerely,

A handwritten signature in blue ink that reads "Jennifer D. Walker". The signature is fluid and cursive, with the first name "Jennifer" being more prominent than the last name "Walker".

Jennifer D. Walker, PMP
Public Works Director



November 13, 2020

Marty Acker, HCP, NEPA, ESA Ecologist
U.S. Fish and Wildlife Service
510 Desmond Dr. SE, Suite 102
Lacey, WA 98503

Dear Mr. Acker:

This letter is to convey Puget Sound Energy's (PSE) remarks regarding the U.S. Fish & Wildlife Service (USFWS) - Notice of Intent to prepare an Environmental Impact Statement for the Thurston County Habitat Conservation Plan (HCP). This letter is submitted for integration under the National Environmental Policy Act (NEPA) public scoping document (i.e., Docket No. FWS-R1-ES-2020- 0101) as well as under the Washington State Environmental Policy Act (SEPA).

PSE has received approval from USFWS regarding its HCP issued under Permit TE81283D-0. This permit is effective September 21, 2020 through September 21, 2025. It is essential to ensure consistency and compatibility with PSE's permitted HCP and the final HCP permit issued to Thurston County. This includes covered activities; avoidance and minimization measures (best management practices); and mitigation measures (conservation).

PSE provides electric and natural gas facilities and services throughout Thurston County. The EIS should provide language addressing the County's proposed population growth and land development activities for the 30-year period proposed for the HCP. Since PSE is required to provide facilities and services to address these growth activities, they should be addressed and covered by the Thurston County HCP.

The EIS should consider the total project impacts that may occur outside of Thurston County's defined project scopes. As part of its obligations within its franchise with Thurston County, PSE is required to relocate its natural gas and/or electric facilities and services if they are in conflict with proposed transportation and capital improvements constructed by Thurston County.

Marty Acker
November 13, 2020
Page Two

This includes maintenance activities. These activities take place in the right-of-way but may also include private property that may result in temporary or permanent impacts. The activities may also include utility work associated with electric substations, distribution and transmission lines; natural gas mains and gate stations.

PSE supports Alternative 2 presented in the NEPA/SEPA Scoping Document for the Thurston County HCP, dated October 26, 2020.

We look forward to working with USFWS and Thurston County during the development of the EIS and final proposed HCP. Should there be any questions regarding these preliminary comments, please do not hesitate to contact me at amy.tousley@pse.com or [REDACTED].
Thank you.

Cordially,

Amy L. Tousley

Amy L. Tousley
Senior Municipal Liaison Manager

Cc: Christina Chaput, Thurston County Planning and Economic Development
Joshua Cummings, Thurston County Planning and Economic Development
Jennifer Walker, Thurston County Public Works
Jessica Jackson, PSE Land Planning



November 15, 2020

Thurston County Board of County Commissioners
2000 Lakeridge Dr. SW
Olympia, WA 98502

Gentlemen:

The South Sound Sierra Club Group, representing over 1400 members and supporters in Thurston County, has the following questions and concerns regarding the draft Habitat Conservation Plan (HCP).

The goal of the HCP is to protect the habitat of the four Endangered Species Act (ESA) species and to ensure the long-term survival of the species while providing a regulatory plan for private and commercial development. Does the Plan provide for additional ESA listings?

We question whether the draft plan of 1:1 mitigation will adequately protect enough habitat for the long term. While the umbrella plan will

The Plan also does not adequately address the climate change projections on habitat. Changes in rainfall may require additional habitat beyond 1:1 mitigation to ensure long term survival.

And, we question the undue tax burden on the public for mitigation for private and public development on endangered habitat.

The draft Mineral Lands Review greatly expands the amount of mineral lands available for mining, especially in pocket gopher habitat. Additional mitigation requirements should be specified for mining operations.

The Plan specifies the County will be responsible for implementation, monitoring and enforcement with an annual review. It does not specify adequate County monitoring and enforcement requirements; County staff is already overburdened. What metrics will be used?

The South Sound Sierra Club Group urges the County to adopt an **improved** Alternative 3: Modified Mitigation for highest conservation benefit. Additionally, we ask the County and USFWS to address the concerns listed above.

Respectfully,

Phyllis Farrell, Chair
South Sound Sierra Club Group



November 16, 2020



Christina Chaput, Senior Planner
Community Planning and Economic Development Department
2000 Lakeridge Dr. SW
Olympia, WA 98502
[via e:mail: Christina.Chaput@co.thurston.wa]

SUBJECT: Thurston County HCP

Dear Ms. Chaput:

Thank you for putting together an HCP for the Thurston County area. The Plan is an important step for protecting threatened and endangered species, and ensuring certainty for future development efforts.

LOTT Clean Water Alliance (LOTT) provides wastewater management services for the urban areas of Lacey, Olympia, and Tumwater in Thurston County. We treat wastewater from these urban areas, and also produce Class A Reclaimed Water that can be reused or reintroduced to the environment. Part of LOTT's long range capacity development plan is to produce more reclaimed water in the future and reintroduce the water to the environment through upland infiltration or surface water and wetland augmentation.

LOTT currently owns several properties in the County that may be suitable for future reclaimed water reintroduction. We are also exploring the need to acquire additional properties for this purpose. Suitable undeveloped sites are challenging to find, especially for infiltration. Soils conducive to infiltration share many characteristics with prairie soils and those that make good pocket gopher habitat. However, it may be feasible to develop future facilities in a manner that supports continued use of the site by gophers or other protected species.

As a regional utility that provides essential public services within the County, LOTT asks that development related to our future facilities be covered under the HCP section 3.1.9, Water Resources Management. These development activities could include installation of conveyance pipelines, development of surface or subsurface infiltration sites, or reintroduction of reclaimed water through surface water or wetland augmentation.

We respectfully ask that this change be made to the HCP to ensure that LOTT can meet the future wastewater management needs of our partner jurisdictions.

Sincerely,

A handwritten signature in blue ink that reads "Lisa Dennis-Perez". The signature is fluid and cursive, with a long horizontal stroke at the end.

Lisa Dennis-Perez
Environmental Planning & Communications Director

Lisadennis-perez@lottcleanwater.org / [REDACTED]



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

*PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341*

November 13, 2020

Christina Chaput, SEPA Contact
Thurston County Development Services
Building #1, Administration
2000 Lakeridge Drive Southwest
Olympia, WA 98502-6045

Dear Christina Chaput:

Thank you for the opportunity to comment on the determination of significance/scoping for the Thurston County Draft Habitat Conservation Plan Project (2020104906). The Department of Ecology (Ecology) reviewed the environmental checklist and has the following comment(s):

SOLID WASTE MANAGEMENT: Derek Rockett [REDACTED]

All grading and filling of land must utilize only clean fill. All other materials may be considered solid waste and permit approval may be required from the local jurisdictional health department prior to filling. All removed debris resulting from this project must be disposed of at an approved site. Contact the local jurisdictional health department for proper management of these materials.

Ecology's comments are based upon information provided by the lead agency. As such, they may not constitute an exhaustive list of the various authorizations that must be obtained or legal requirements that must be fulfilled in order to carry out the proposed action.

If you have any questions or would like to respond to these comments, please contact the appropriate reviewing staff listed above.

Department of Ecology
Southwest Regional Office

(GMP:202005339)

cc: Derek Rockett, SWM

2013 Scoping Comments (NEPA Only)





PHILLIPS WESCH BURGESS
PLLC

724 Columbia St. NW, Suite 140
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360-742-3500
facsimile: 360-742-3519
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May 20, 2013

TRANSMITTED VIA ELECTRONIC MAIL

WFWOComments@fws.gov

and

Tim_Romanski@fws.gov

Tim Romanski
U.S. Fish and Wildlife Service
Washington Fish and Wildlife Office
510 Desmond Drive SE, Suite 102
Lacey, Washington 98503-1263

Re: Thurston County Prairie HCP-EIS

Dear Mr. Romanski:

On behalf of our client, the Thurston County Chamber of Commerce (the "Chamber"), the following comments are submitted on the scope for the proposed South Puget Sound Prairie Habitat Conservation Plan ("Prairie HCP") Environmental Impact Statement. The Chamber has over 1,250 member businesses from across Thurston County who stand to be impacted by the Prairie HCP. The Chamber has been involved in the Mazama pocket gopher issues since late 2011, and seeks to ensure that the process is not short-changed by an inadequate scope.

The scope for the Prairie HCP should be broad. 40 C.F.R. §1501.7(a)(2). The proposal for the Prairie HCP covers eighteen (18) prairie species in Thurston County and many different types of land uses and activities over a proposed 30-to 50-year term, including agricultural, industrial, commercial, and residential uses on currently developed and undeveloped acres, as well as acres already designated for prairie conservation. The scope must, therefore, be broad enough to include the following significant issues and alternatives:

- (i) the spatial scale of the analysis should include more than the unincorporated areas of Thurston County to avoid a result that is too narrow to be effective;
- (ii) the analysis should evaluate the significant differences in land use that affected extirpated gopher populations;
- (iii) the analysis should describe and evaluate the effectiveness of existing conservation and regulatory efforts;

(iv) the alternatives should include an evaluation of regulatory flexibility and incentive programs; and

(v) throughout the development, the United States Fish and Wildlife Service (the “Service”) needs to ensure the best available science is consistently used.

Scoping is one of the numerous decisions in a framework of intertwined actions proceeding concurrently. Accordingly, we also request that the Service consider the comments submitted for the listing of the prairie species, the associated critical habitat designations, and the proposed 4(d) rule in conjunction with the scope of the Prairie HCP. See 40 C.F.R. §1501.7(a)(5),(6). We request that the Service continue to provide ongoing opportunities for timely public comment, review opportunities, and stakeholder input as the Environmental Impact Statement and Prairie HCP are developed, as required by the National Environmental Policy Act, particularly if the Service considers, as we request below, an incentive program and regulatory flexibility, such as a credit-debit system for mitigation banking for prairie habitat and species.

A. To be Legally Adequate and Useful for Conservation, the Scope Must be Broad

1. The scope of the Prairie HCP must include broad geographic scale and term

The proper starting point for a proposal is the existing baseline, and the best available science recognizes that the locations of prairie species are not limited to unincorporated areas of Thurston County. *National Wildlife Federation v. National Marine Fisheries Service*, 524 F.3d 917, 924 (9th Cir. 2008) (“The environmental baseline includes ‘the past and present impacts of all Federal, State or private actions and other human activities in the action area.’...”); *Bennett v. Spear*, 520 U.S. 154, 172 (1997) (The Secretary must use “the best scientific data available” in designation of critical habitat.) For example, the Tumwater Urban Growth Area contains the known densest concentration of pocket gophers at the Port of Olympia’s Airport. Because the potential impact of take and the effectiveness of mitigation will be spatially dependent, the scope of the Environmental Impact Statement must include a sufficiently broad scale to encompass these issues.

In addition to a sufficiently broad geographic scale, the Environmental Impact Statement should include a cumulative effects analysis of all past, present, and reasonably foreseeable future land use actions that have the potential to affect prairie species, including the proposed term for the Prairie HCP. A 30-to 50-year term may be appropriate for long-lived species where potential habitat requires substantial growth before it provides conservation value, but the Environmental Impact Statement should include an analysis why short-lived prairie species who are likely to receive near-term immediate benefit from existing, voluntary minor modifications to land use activities would receive additional conservation value from a longer term, particularly where there is no federal Recovery Plan that specifies the horizon for projected population recovery.

2. The Environmental Impact Statement should distinguish extirpated populations

Although the notice of intent identifies the extirpation of subpopulations of the gopher, 78 Fed. Reg. 17226, the scope needs to be broad enough for the Environmental Impact Statement to address the different regulatory environments that govern current development and conservation activities. Tacoma pocket gophers may have been extirpated due to urban development, but that extirpation predated the existing regulatory scheme, including the Growth Management Act, increasingly sophisticated scientific understanding of the habitat needs and management options for the gopher, and the comparative density of Thurston County relative to Pierce County. Thus, the scope should be broad enough for the Environmental Impact Statement to comprehensively address the conservation effects of the growth management act and other conservation commitments in Thurston County, rather than relying on conclusory and unsubstantiated assumptions from historic land use decisions in Pierce County.

3. The Environmental Impact Statement must address existing protections from regulatory and voluntary conservation commitments

Historically, because federal Recovery Plans do not have the force of law, *Fund for Animals v. Rice*, 85 F.3d 535, 547 (11th Cir. 1996) (“recovery plans are for guidance purposes only”), the Service relies heavily on voluntary commitments from non-federal landowners. Any alternative that shifts the burden for conservation onto landowners with low potential to contribute to the conservation already provided in the remaining high-quality prairie habitat, would be contrary to the Service’s past practices and create a disincentive for cooperation in voluntary conservation efforts.

Thus, the scope must also be broad enough for the Environmental Impact Statement to take into account the existing conservation opportunities and commitments, such as the Port of Olympia’s conservation efforts at the Olympia Airport, and Thurston County’s existing Critical Areas Ordinance, which protects prairies and prairie species. *See* TCC 24.25.065.

The scope must also be broad enough to consider the existing regulatory and operating environment impacting the species.

4. The Environmental Impact Statement should address an incentive program and regulatory flexibility

The scope should also be broad enough that the Environmental Impact Statement considers an alternative including an incentive program and regulatory flexibility. Unlike many imperiled species, the prairie species may thrive in habitat that has been affected by human activities. For these prairie species, conservation will not be equivalent to limiting human activity in prairie habitat. Working lands, which include grazing pastures, cultivated crops, and tree farms, as well as the Olympia Airport, provide habitat for prairie species.

Therefore, the Environmental Impact Statement should include an alternative that evaluates the situations where conditions for the prairie species can be improved by human activity, and include an incentive program and regulatory flexibility that permit successful species conservation in those situations. For example, flexible regulations can provide the greatest overall gains for prairie and species conservation where, in appropriate site conditions, applicants could combine other regulatory requirements, such as landscaping and stormwater facilities, with prairie restoration and/or habitat protection areas.

Any incentive program is more likely to be effective if it includes a reward system for landowners who voluntarily improve habitat conditions. Similar to Safe Harbor Agreements, it will be important to ensure that landowners who manage their property to benefit prairie species are not penalized at a later date if prairie species occupy previously non-habitable areas.

B. Potential Legal Effects from an Inadequate Scope

An inadequate scope could result in an invalidated Environmental Impact Statement, necessitating beginning the process again from the start. While the action agency has considerable discretion in determining the appropriate scope, an overly narrow scope could result in an inadequate range of reasonable alternatives. Thus, it would be more efficient for the Service to take the time necessary to develop an adequately scoped proposal rather than to rush forward with a potentially deficient scope, and to ensure that relevant scientific information which might bear on the proposal or its impacts is considered at the appropriate stage, instead of devoting time and resources to a proposal that will need to be reconsidered shortly after completion. 40 C.F.R. §1501.7(c).

1. A narrow scope could result in an inadequate range of alternatives

A narrowly restrictive scope could result in legal inadequacy on any one of a number of grounds. For example, if the alternatives fail to consider the highest concentration of gophers because they are inside the urban growth areas in Thurston County, it would likely be found inadequate because it would fail to take into account the population dynamics associated with the regional area. Because the Service identifies the primary threat to prairies and their associated species as land development and other incompatible uses,¹ the proposed scope must include those specific activities. If they were excluded, it could result in invalidation due to an arbitrary and capricious failure to consider the Service's own listing documents. *Marsh v. Oregon Natural Resources Council*, 490 U.S. 360, 378 (1989) ("[I]n making the factual inquiry concerning whether an agency decision was 'arbitrary or capricious,' the reviewing court 'must consider whether the decision was based on a consideration of the relevant factors and whether there has been a clear error of judgment.' ... [C]ourts should not automatically defer to the agency's express reliance on an interest in finality without carefully reviewing the record and satisfying themselves that the agency has made a reasoned decision based on its evaluation of the

¹ "A sizable portion of South Puget Sound Prairie habitat is located in the urban-rural interface Based on current zoning and land use regulations, future development in the county is likely to occur on lands with prairie soils and habitat suitable for rare prairie species protection or restoration." 78 Fed. Reg. at 17225 (March 20, 2013).

significance – or lack of significance – of the new information. A contrary approach would not simply render judicial review generally meaningless, but would be contrary to the demand that courts ensure that agency decisions are founded on a reasoned evaluation ‘of the relevant factors.’”) (in context of challenge whether to supplement EIS).

Similarly, alternatives that do not evaluate the efficacy of existing conservation efforts would likely be legally deficient because the Endangered Species Act does not permit mitigation merely for mitigation’s sake, but requires the mitigation to be effective. *Neighbors of Cuddy Mountain v. U.S. Forest Service*, 137 F.3d 1372 (9th Cir. 1998) (“Mitigation must “be discussed in sufficient detail to ensure that environmental consequences have been fairly evaluated.” ‘A mere listing of mitigation measures is insufficient to qualify as the reasoned discussion required by NEPA.’”) (internal citations omitted); *Southwest Center for Biological Diversity v. Bartel*, 470 F. Supp. 2d 1118, 1123 (S.D. Cal. 2006) (Service required to reinitiate consultation for Incidental Take Permit where mitigation unlikely to conserve listed species). Unless an evaluation of conservation efforts is completed concurrently with and included in the Environmental Impact Statement, or research and monitoring are included in the Prairie HCP, the mitigation could be at risk of being found legally unsound, requiring a reinitiation of consultation.

While the decision maker will have the discretion to ultimately choose the best alternative to balance the competing economic obligations and conservation efforts, that alternative must be within the range of alternatives analyzed in the Environmental Impact Statement. *City of Carmel-by-the-Sea v. U.S. Dep’t of Transportation*, 123 F.3d 1142, 1155, 1159 (9th Cir. 1997) (“The stated goal of a project necessarily dictates the range of ‘reasonable’ alternatives and an agency cannot define its objectives in unreasonably narrow terms.”), citing *Citizens Against Burlington v. Busey IV*, 938 F.2d 190, 196 (D.C. Cir. 1991) (“[A]n agency may not define the objectives of its action in terms so unreasonably narrow that only one alternative from among the environmentally benign ones in the agency’s power would accomplish the goals of the agency’s action and the EIS would become a foreordained formality.”) Avoiding this fatal procedural error can only occur if the scope is broad enough to result in a range of alternatives analyzed in the Environmental Impact Statement that is adequate.

2. Failure to take into account existing regulatory mechanisms could result in invalidation

One factor considered in the decision whether to list a species as threatened or endangered is whether existing regulatory mechanisms are inadequate. Washington State’s Growth Management Act already requires counties to protect critical areas, which includes prairie habitat. RCW 36.70A.710. A scope that fails to take into account the effectiveness of Thurston County’s existing Critical Areas Ordinance that protects South Puget Sound prairies and oak woodlands could create alternatives that fail to reflect the status quo. *Custer County Action Association v. Garvey*, 256 F.3d 1024, 1040 (10th Cir. 2001) (“In requiring consideration of a no-action alternative, the Council on Environmental Quality intended that agencies compare the potential impacts of the proposed major federal action to the known impacts of maintaining

the status quo.”) Thus, an inadequate or baseless status quo could lead to invalidation of the comparative impacts in the alternative analysis.

With respect to the gopher, not only is the species state-listed, *see* WAC 232-12-011 (state-threatened and sensitive) and 232-12-014 (state-endangered), but the Washington Department of Fish and Wildlife issued *Priority Habitat and Species Management Recommendations* for it in 2007. Thurston County is already required to follow those recommendations through Habitat Management Plan requirements in their state-mandated Critical Area Ordinances, which are enacted under the Growth Management Act. RCW 36.70A. These mechanisms need to be included in the scope to the extent they are already providing prairie habitat protection.

The County is better positioned than the Service as a matter of public policy to address the environmental issues specific to its geographic location and the complexity of balancing economic development and conservation at a smaller spatial scale than the Service’s mission. While there remains a need for public education on the prairie species, as the Service recognized in its proposed rule to list the *Mazama* pocket gopher and designate critical habitat, 77 Fed. Reg. 73784-85 (December 11, 2012), existing regulatory mechanisms are currently in place.

3. A failure to give appropriate consideration to best available science could lead to invalidation

The Washington Department of Fish and Wildlife (the “Department”) is the leader in science on the prairie species for Thurston County. The Department has published survey results, a status report, and a recovery plan for the gopher as recently as January 2013. Stinson, D.W. 2013, *Draft Mazama Pocket Gopher Status Update and Washington State Recovery Plan*, Washington Department of Fish and Wildlife, Olympia; Stinson, D.W. 2005, *Washington State Status Report for the Mazama Pocket Gopher, Streaked Horned Lark, and Taylor’s Checkerspot*, Washington Department of Fish and Wildlife, Olympia. The Environmental Impact Statement must include that current science, as well as the state-listing status and protections, and sufficient scientifically-based rationale if the Service seeks to support a contrary conclusion to the Department’s determination that existing regulatory mechanisms are adequate. *Seattle Audubon Society v. Espy*, 998 F.2d 699, 704-05 (9th Cir. 1993) (an environmental impact statement that relies on stale scientific evidence, incomplete discussion of environmental effects, and false assumptions is inadequate.)

An important consideration for the scope of analysis is the impact of taxonomic uncertainty on effective mitigation strategies. The best available science indicates uncertainty whether subspecies of the *Mazama* pocket gopher are distinct, and additional mtDNA research may be required. A potential change in the taxonomic status needs to be addressed in the analysis not only because it affects the Secretary’s determination for issuance of the Incidental Permit, but because it will also influence mitigation breadth and strategy.

4. A failure to evaluate existing conservation efforts could lead to invalidation

A project proponent is not required to recover species; rather, to meet the requirements for issuance of an Incidental Take Permit, the Secretary must find that the requested taking will be incidental, the applicant will minimize and mitigate the impacts of the taking, the applicant will ensure adequate funding, and the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild. 16 U.S.C. § 1539(a)(2)(B).

Without an adequate understanding of the baseline population and existing protective mechanisms, the Secretary will be unable to find that the requested taking will be incidental, proposed measures to minimize and mitigate the taking will be effective, or the taking will not appreciably reduce the likelihood of survival and recovery of the species in the wild. *See, e.g., National Wildlife Federation v. Norton*, 306 F.Supp.2d 920, 928 (E.D. Cal. 2004) (“if a permit authorized the destruction of one acre of habitat that normally supports one individual member of a protected species, it would not be necessary for the applicant to create 100 acres of new habitat that would support some 100 individuals of the species, even if the particular developer could afford to do so.”) As the Service is aware, to be legally adequate, much more than a conclusory statement is required. *Klamath-Siskiyou Wildlands Center v. Bureau of Land Management*, 387 F.3d 989, 995 (9th Cir. 2004) (a conclusory presentation is insufficient to constitute the “hard look” required by the National Environmental Policy Act.)

Prairie habitat is currently protected in Thurston County through multiple mechanisms, including the Department of Natural Resources’ protection of prairie habitat in its Mima Mounds Natural Area Preserve and Rocky Prairie Natural Area Preserve, the Nature Conservancy’s cooperative efforts with Fort Lewis on enhancement and management projects, private landowners’ voluntary contributions, and conservation in West Rocky Prairie Wildlife Area, Wolf Haven International, Black River-Mima Prairie Glacial Heritage Preserve, Scatter Creek Wildlife Area, and Glacial Heritage Preserve. All existing protections must be considered in the Environmental Impact Statement’s evaluation to provide the legally sound “hard look” required by the National Environmental Policy Act.

The scope must be broad enough to discuss whether unoccupied, inadequate, or marginal prairie could provide any conservation value, particularly where the best remaining prairie habitat in Thurston County is already protected. This analysis will be essential to the Secretary’s 16 U.S.C. § 1539(a)(2)(B) determination.

5. The scope must be broad enough to consider adaptive management and research and monitoring

Scientific research assists agencies in planning efforts to provide effective management and mitigation for proposals that may affect species. In Thurston County, the Washington Department of Fish and Wildlife has conducted extensive survey and relocation efforts to evaluate whether relocation can serve as an effective management tool. The scope needs to be

sufficiently broad so that the Environmental Impact Statement include not only how the Prairie HCP will incorporate adaptive management, *see National Wildlife Federation v. Babbitt*, 128 F. Supp.2d 1274, 1282 (D.C. Cal. 2000), for prairie species over the 30-to 50-year proposed term, but identify ongoing research and monitoring and discuss how the information in those recent and pending studies will be timely incorporated into the analysis in the Environmental Impact Statement. The scope must also be broad enough to include additional science that will be necessary in order to develop management strategies that will provide effective mitigation and conservation, and how that will be monitored and modified if adequate information is not readily available.

Accurate surveys and locations of prairie species will be essential for development of a legally sound Prairie HCP. As you are aware, it is difficult to survey for the gopher in a non-invasive manner as one of its predator-avoidance strategies results in very little time above ground. In the 9th Circuit, existing legal precedent restricts activity to locations where species are known to be present. *Defenders of Wildlife v. Bernal*, 204 F.3d 920, 926-27 (9th Cir. 2000) (court affirmed no take and denial of permanent injunction where no pygmy owls present in Section 9 "take" case). The scope of the Prairie HCP should be broad enough to evaluate the probability of occupancy, how additional science could improve accuracy, and how the Prairie HCP will be modified over time as survey technology becomes more sophisticated and accurate. It should also include a discussion addressing why the Service believes it is not cost effective to complete the ongoing scientific research before developing Environmental Impact Statement for the Prairie HCP where there is no increase in the threats identified in the listing factors, but considerable voluntary commitments to conservation efforts to preserve and restore historic and existing habitat.

We appreciate the Service providing the opportunity for public comment at this early stage of the planning process, and we look forward to working with the Service on behalf of our client to ensure its interests are considered in the development of a thorough and legally sound Prairie HCP for Thurston County.

Yours very truly,



Heather L. Burgess

HLB/mfw

cc: Phil Anderson, Director, Washington Department of Fish and Wildlife (via email: Philip.Anderson@dfw.wa.gov)
Thurston County Commissioner Cathy Wolfe (via email: wolfec@co.thurston.wa.us)
Thurston County Commissioner Sandra Romero (via email: romeros@co.thurston.wa.us)
Thurston County Commissioner Karen Valenzuela (via email: valenzk@co.thurston.wa.us)

May 20, 2013

Page 9 of 9

Lon Wyrick, Executive Director, Thurston Regional Planning Council (via email:
wyrickl@trpc.org)

David Schaffert, President/CEO, Thurston County Chamber (via email:
DSchaffert@thurstonchamber.com)

Alex Smith, Environmental Director, Port of Olympia (via email:
AlexS@portolympia.com)

John Doan, City Administrator, City of Tumwater (via email: jdoan@ci.tumwater.wa.us)

Linda Krippner, Ecologist/Owner, Krippner Consulting, LLC (via email:
linda@krippnerconsulting.com)

Jami Balint, Company Counsel, Segale Properties, LLC (via email:
JBalint@segaleproperties.com)



March 26, 2013

**TRANSMITTED VIA FIRST-CLASS U.S MAIL
and ELECTRONIC MAIL**
ken_berg@fws.gov

Ken S. Berg, Manager
Washington Fish and Wildlife
U.S. Fish & Wildlife Service
510 Desmond Drive SE, Suite 102
Lacey, Washington 98503-1263

clarks@co.thurston.wa.us
Scott Clark
Thurston County Planning Director
2000 Lakeridge Drive SW
Olympia, WA 98502-6045

Dear Mr. Berg and Mr. Clark:

**Re: Request for Second Scoping Meeting, EIS for Proposed South Puget
Sound Prairie Habitat Conservation Plan, Thurston County**

As you are both aware, my organization, together with a number of community partners, has been deeply involved with issues associated with the proposed federal listing of the Mazama pocket gopher under the Endangered Species Act for the last two years. I have personally attended multiple meetings regarding the Mazama pocket gopher with Mr. Berg and his staff, as has the Chamber's legal counsel, Heather Burgess. These meetings have included discussions of the anticipated Thurston County Habitat Conservation Plan ("HCP") process.

Given the Thurston County Chamber's extensive involvement with this issue, I was quite surprised to learn of the upcoming joint USFWS/Thurston County April 6, 2013 public scoping meeting regarding the EIS for the proposed HCP through our counsel's forwarding of the March 20, 2013 Federal Register notice and March 23, 2013 Thurston County e-mail notification to me. In my opinion, setting the only open public meeting on this subject less than two weeks out for a Saturday during spring break for local school districts does not appear likely to secure the type of public participation

needed and presumably intended by the agencies concerned. I have already heard from several key community members who will not be able this meeting to attend due to previously scheduled personal and business activities.

The proposed federal listing of the Mazama pocket gopher and the HCP the County intends to implement as a result will have profound impacts on Thurston County for decades to come. In light of this significant impact, and the exceedingly limited notice given of this ill-timed public meeting given to our community, I respectfully request that the USFWS and Thurston County hold a second public scoping meeting on a weekday evening. This second meeting should be held closer to the conclusion of the May 20, 2013 written comment period and with sufficient notice to allow for ample and widespread publication of the event.

I look forward to your response.

Very truly yours,



David Schaffert
President CEO

cc: Thurston County Commissioner Sandra Romero (via email: romeros@co.thurston.wa.us)
Thurston County Commissioner Cathy Wolfe (via email: wolfec@co.thurston.wa.us)
Thurston County Commissioner Karen Valenzuela (via email: valenzk@co.thurston.wa.us)
Mayor Ron Harding, City of Yelm (via email: ronh@ci.yelm.wa.us)
Shelley Badger, Yelm City Administrator (via email: shellyb@ci.yelm.wa.us)
Mayor Pete Kmet, City of Tumwater (via email: pkmet@ci.tumwater.wa.us)
John Doan, Tumwater City Administrator (via email: jdoan@ci.tumwater.wa.us)
Ed Galligan, Executive Director, Port of Olympia (via email: edg@portolympia.com)
Mike Kirby, Superintendent, Tumwater School District (via email: mike.kirby@tumwater.k12.wa.us)
Michael Cade, Executive Director, Thurston EDC(via email: MCade@thurstonedc.com)
Lon Wyrick, Executive Director, Thurston Regional Planning Council (via email: wyrickl@trpc.org)
George LeMasurier, Publisher, The Olympian (via email: glemasurier@theolympian.com)
Mr. Tim Romanski, USFWS Lacey (via email: tim_romanski@fws.gov)



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10**

1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

OFFICE OF
ECOSYSTEMS,
TRIBAL AND PUBLIC
AFFAIRS

May 20, 2013

Mr. Tim Romanski
U.S. Fish And Wildlife Service
Washington Fish And Wildlife Office
510 Desmond Dr SE Ste 102
Lacey, WA 98503-1263

Re: South Puget Sound Prairie Habitat Conservation Plan, Thurston County, Washington –
Notice of Intent to Prepare an Environmental Impact Statement. Project Number 13-0015-AFS.

Dear Mr. Romanski:

The U.S. Environmental Protection Agency has received the Notice of Intent to Prepare an Environmental Impact Statement for the South Puget Sound Prairie Habitat Conservation Plan and proposed issuance of an Incidental Take Permit. We are submitting comments in accordance with our responsibilities under the National Environmental Policy Act and Section 309 of the Clean Air Act. Thank you for involving us in this project.

USFWS proposes to issue an Incidental Take Permit to Thurston County that would cover two federally listed species, three species proposed to be federally listed, one candidate species, and twelve non-listed species that are associated with South Puget Sound Prairies. Thurston County is seeking coverage for activities that it conducts, permits, or otherwise authorizes which may include, but are not limited to:

- planning and permitting of residential and agricultural structures and facilities on existing legal lots;
- permits for private and new subdivision road construction and maintenance;
- permits for work in right-of-ways;
- construction and maintenance of county-owned buildings and other administrative facilities;
- construction and maintenance of county parks and historical cemeteries including roads, trails, vegetation management, structures, recreational activities, scientific research;
- construction and operation of solid waste facilities;
- permitting and monitoring of wells, septic systems, and decommissioning of home oil tanks;
- maintenance and monitoring of water resources and associated facilities;
- construction, installation, extension, and maintenance of surface water intake facilities, pumping plants, well houses, water treatment facilities, and water supply pipelines;
- emergency response, cleanup, and restoration associated with natural disasters;
- habitat restoration activities on county-owned or controlled land, the Voluntary Stewardship Program for agricultural activities in habitat areas, and all habitat enhancement activities associated with implementation of the HCP.

The proposed term for the Prairie HCP and permit is from 30 to 50 years.

We commend Thurston County for their recognition of the value and importance of prairie ecosystems and for their proactive efforts to conserve them. We support the preventative, precautionary multi-species approach wherein the HCP and ITP would cover an array of both federally listed and non-listed at-risk species. We also support the proposed term of the HCP/ITP. The following comments are offered to assist in the development of the HCP and its associated NEPA analysis:

Establish Goals for the HCP That Form the Basis of the NEPA Analysis.

To be effective and meaningful, the provisions of the HCP must contribute to the long-term sustainability of South Puget Sound prairie/oak woodland ecosystems. To this end, we recommend that the HCP and associated NEPA analysis be focused upon and evaluate the extent to which proposed actions meet the following goals, wherein the conservation actions:

- are based on sound science;
- would conserve prairie ecosystems as a whole; and
- are consistent with the recovery goals and needs for listed and at-risk species.

We also recommend that the following conservation strategy objectives and methods be applied, and that the NEPA analysis evaluate the extent to which the proposed HCP would incorporate them:

Seek and Give Priority to Conservation Opportunities that Support and Provide Multiple Environmental Objectives and Benefits.

In addition to habitat conservation/restoration, consider associated ecosystem functions, processes, and services, such as protection of surface and ground water quality and quantity that may be provided. Protect/restore habitats that overlie high value and/or vulnerable groundwater/drinking water supplies, habitats along wetlands and stream networks, and habitats that contribute in other ways to ecosystem, watershed, and/or Puget Sound health.

Pursue Net Gains in Prairie Habitat.

According to the Notice of Intent, South Puget Sound prairies and oak woodlands are among the rarest habitats in Washington, with only about 10% remaining. Less than 3% of remaining habitat is considered high-quality prairie habitat. To achieve long-term sustainability, it is important to compensate for any new losses above and beyond a 1:1 ratio of replacement. Compensation through preservation, as in conservation banks, and through restoration of historic prairie habitats are both needed to achieve net gains in habitat.

Align Conservation Efforts with Current Landscape-Level Strategies for Protecting, Conserving, and Restoring Prairie Ecosystems and their Connectivity.

We support and encourage partnerships among federal, state, local, and non-governmental entities to strategically and collaboratively conserve, restore, and maintain prairie habitat. We recommend that strategic efforts include the following:

- Establish conservation banks; focus efforts using existing maps of current and historic prairie/oak woodland habitats;
- Identify and prioritize the largest, most intact habitat patches;
- Identify and establish corridors/connections between and among habitat patches;
- Provide redundancy of habitats in the landscape;

- Identify and protect important refugia and biodiversity hotspots for prairie/oak woodland dependent plant and animal species;
- Restore degraded habitats, particularly those with the greatest potential for restoration and for meeting landscape-level conservation strategies;
- Seek to complement, augment, and connect with the important conservation work occurring on Joint Base Lewis-McChord;
- Seek management agreements with landowners of working lands that contain remnant and/or high quality habitat, such as lands grazed by livestock;
- Consider land exchanges;
- Include a full spectrum of habitats and species, both wet prairies and drier upland prairie/oak woodland habitats;
- Enable and implement species re-introductions in viable locations/habitats;
- Conduct salvage of plants, propagules, and prairie soils where remnant habitats are to be developed;
- Ensure that prairie restoration/management actions are socially and ecologically sensitive with respect to short and long-term direct, indirect, and/or cumulative effects. Avoid the use of chemicals if possible; and
- Provide incentives to landowners to retain and maintain prairie habitats and to have compatible land uses.

Provide Authorization and Adequate Funding for the Active Management that is Necessary to Restore and Maintain Prairie Ecosystems.

Management activities, such as prescribed burning, removal and control of invasive species, which are ongoing and necessary to perpetuate prairie habitats need to be legal, feasible with respect to cost/funding and logistics, and reasonably acceptable to jurisdictions, landowners, and neighbors. We support their inclusion, as proposed above, among the covered activities.

Address Landowner Needs and Development Activity in the Interim as well as when covered by the Proposed HCP/ITP.

Both now and when the proposed HCP/ITP would be implemented, it is important to accommodate land uses and development activities while providing for conservation needs. Consider working with Thurston County to establish an interim strategy to accommodate and mitigate for development impacts on habitats and species. Under pre- and post-HCP/ITP scenarios, strive to create land use credit/debit methodologies that are transparent and easy to communicate to the public, consultants, and builders. Work with partners to establish effective outreach and communication with all affected interests.

Consider Climate Change.

The EIS should disclose the extent to which the HCP and potential issuance of an ITP would incorporate consideration of climate change. The EIS should discuss the potential effect of the covered/proposed actions on climate change, the effect of climate change on the covered/proposed actions, and how the HCP and ITP would incorporate climate change mitigation, adaptation, and education.

Monitor Effects and Outcomes.

We recommend that the proposed action include a monitoring program designed to assess implementation of the HCP over time, the effectiveness of the HCP in achieving conservation goals, other positive or negative effects that may occur, and a mechanism to make adjustments if necessary.

Thank you for the opportunity to offer scoping comments on this important conservation effort. If you have questions or would like to discuss these comments, please contact me at (206) 553-2966 or by electronic mail at somers.elaine@epa.gov.

Sincerely,

A handwritten signature in blue ink, appearing to read "Elaine L. Somers", with a stylized flourish at the end.

Elaine L. Somers
Environmental Review and Sediment Management Unit



U.S. FISH & WILDLIFE SERVICE

WFWO

APR 15 2013

LACEY, WA

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P. O. Box 258
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Mayor Randy Schleis
Councilmember Kristin Guizzetti
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Councilmember Dennis McVey
Councilmember Christine Winslow

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April 10, 2013

Tim Romanski
U.S. Fish and Wildlife Service
Washington Fish and Wildlife Office
510 Desmond Drive SE, Suite 102
Lacey, WA 98503-1263

RE: Comments on South Puget Sound Prairie Habitat Conservation Plan EIS Scoping

Dear Mr. Romanski,


The City of Rainier would like the following comments to be included in the public scoping to prepare a draft Environmental Impact Statement (EIS) related to the South Puget Sound Prairie Habitat Conservation Plan (HCP).

Inclusion within EIS Scoping. The City of Rainier would like to be included within Thurston County's EIS scoping for the South Puget Sound Prairie HCP. While it is unclear whether City of Rainier will implement the HCP (details about the plan have not been worked out and we do not know if it is in our interest), the City of Rainier does not want to be excluded from the process.

Potential Funding. Additionally, the City of Rainier requests that, if possible, funding be provided to help Rainier participate in the development of a HCP. The City of Rainier receives planning services on a contract basis from Thurston Regional Planning Council (TRPC) and this contract is not sufficient to pay the agency to participate in the development of the South Puget Sound Prairie HCP or a HCP for the City of Rainier. As a result, the City of Rainier will likely regulate the endangered species, and their associated habitat, on a site-by-site basis. Project applicants will be responsible for HCPs and incidental take permits will be issued by the U.S. Fish and Wildlife Service. While this approach does not seem to be the best solution for the species or agencies involved, the City of Rainier likely has no other option without additional funding.

Thank you for the opportunity to comment on these issues. I look forward to working with you on each of the suggestions. If you have any questions about either of the issues, please give Fred Evander, City Planner at 360 741-2514 or email at evanderf@trpc.org.

Sincerely,


Randy Schleis, Mayor

ATTN: Tim Romanski

Dear Tim -

I am writing to you to express my opposition to listing to Mazana Pocket Gopher as endangered. I believe there are adequate measures to protect it on a local and state level. There is new scientific evidence that supports not listing it because the populations are higher and at sustainable levels. There are many negative and downside risks to our community that will be unreparable if the gopher is listed. I am very concerned about the far reaching effects of a listing.

I live in the Tumwater area.
Dirk Emmerich Ph 

Dirk

4/6/13 -

USFWS / Thurston County Public Meeting

Subject: The Facts about Mazama Pocket Gophers and Why They Should Not Be a Listed Species

I would like to introduce myself, my name is Key McMurry. I am currently the Owner and Professional Stream and Wildlife Biologist of Key Environmental Solutions, LLC. (KES). KES is a private environmental consulting firm which performs critical area assessments and Habitat Management Plans (HMP's) for state and federally threatened and endangered species.

I am contacting you, to ask for your assistance in helping broach the subject of the Mazama Pocket Gophers and why they should not be a state threatened listed species or proposed as a Federal listed species to the attention of Governor Gregoire and our Congressional Delegation.

A little history, I worked at WDFW in Thurston County as the Area Habitat Biologist in 2006 and 2007 and one of my duties was to deal with the Mazama Pocket Gophers. One of the services that KES performs is Mazama Pocket Gopher Recon and Surveys and write Habitat Management Plans. I am also called frequently to testify as an expert witness in regards to the Mazama Pocket Gopher. So I have been on both sides of the gopher issue.

In 2005, WDFW conducted their own study of the Mazama Pocket Gopher around the Olympia Airport area. The Mazama Pocket Gopher is a rodent that typically lives in Prairie Habitat. Based on the results of this study, WDFW listed the Mazama Pocket Gophers as a state threatened species in March of 2006. Proper scientific studies were not performed over the entire western Washington habitat range and WDFW should have never listed the Mazama Pocket Gopher as a state threatened species. It was based on bad science and bad math. I am sure you are all aware that when a State or Federal Agency list a species as threatened or endangered they are supposed to look at the entire habitat range, this did not happen with the Mazama Pocket Gophers. All of Thurston County, Mason County, Lewis County, Grays Harbor County, and Clark County were not included when the Mazama Pocket Gophers were listed as a state threatened species. Since the listing of the Mazama Pocket Gopher, large populations have been found in all of these counties and in a wide range of habitats. Originally, WDFW concluded that Mazama Pocket Gopher could only be found in Prairie Habitat. But we have found them in a wide range of habitats including: the Capitol Forest, clear-cuts, roadside gravels, old Christmas tree farms, and in heavily disturbed areas.

There was absolutely no science behind WDFW listing the Mazama Pocket Gopher or the 3:1 mitigation ratio they require for impacts. In fact, we have WDFW under oath and on record that the 3:1 mitigation ratio was strictly a policy call and that there was no science behind it.

According to WDFW and a 1996 Witmer study, individual gopher's live in circle which is approximately equal to 100 square meters. The approved consultants are not performing Gopher surveys, we are performing mound surveys. Originally, WDFW had us putting a 10 meter radius circle around each mound, which actually equates to 314.16 square meters. We caught them in a large mathematical error in January 2011, we were only supposed to be putting a 5.64 meter circle around each mound, which actually equates to 100 square meters. WDFW actually knew they had made the mathematical mistake in 2008 but were waiting for someone to catch them. One gopher might mound 2 times in the 5.64 meter circle and another might mound 15 times. So each mound gets a 5.64 meter circle placed around it, even though the number of mounds does not equal the number of gophers. If you impact any of the 5.64 meter circles, the landowners then have to mitigate with the made-up 3:1 mitigation ratio. The landowners have to set-aside large portions of their property to protect the gophers. One example of a 40 acre parcel down in Rochester, which was loaded with gophers, the set-aside area when we were

required to place the 10 meter circles around each mound, was a 52 acre set-aside. Another landowner with a 5.5 acre site had to set-aside their entire property outside of the footprint of the proposed new house using the 5.64 meter circles. I have many more examples of how WDFW's listing of the Mazama Pocket Gopher as stated threatened as affected landowners and development. In the past 5 years of conducting surveys and HMP's in the field, it has become evident that the Mazama Pocket Gophers are much more prolific and widespread than the original limited study indicated.

Recently, at a site purchased for use as an off-site set-aside area for the gophers, the WDFW wildlife biologist who trains all of the consultants came out and told the consultant doing the baseline survey for gopher occupancy, that 90% of her work was wrong and that they were all moles. Well, I was asked to come out and see what I thought. I quickly confirmed that they were all gopher mounds. To settle this discrepancy video cameras were set-up and Mazama Pocket Gophers were caught on film and video using the mounds, not moles as WDFW said. There are several more sites involving different consultants and circumstances, in which gophers mounds were called moles by WDFW.

This is very disturbing on several levels, we have spent over a year trying to tell WDFW that we are finding gophers in huge numbers, in areas that are not prairie and in areas where we were told the gophers did not exist or could not live. Finally, this summer WDFW decided that additional surveys were needed. WDFW sent the same staff person out to perform these additional surveys that called all the mounds moles at the offsite set-aside area. The news that we have been receiving back from WDFW is that the areas where we have said there were gophers, WDFW only is finding moles. This is also the same person that trains all the consultants. WDFW also agreed to do some genetic testing on the gophers. WDFW was supposed to have written their own Habitat Management Plan for the Mazama Pocket Gophers in 2008. The WDFW Habitat Management Plan, the genetic testing and the additional surveys should have all been done prior to WDFW listing the species. WDFW has either gone down the path to far with the gopher listing, rules and regulations to admit their original errors or they are in serious denial of the actual facts.

WDFW is determined to get the Mazama Pocket Gophers federally listed and have been working very hard to convince USFWS to list them federally. USFWS had not received any of our surveys or data from WDFW, only the original core Olympia Airport data. We provided USFWS all of the surveys and Habitat Management Plans. Governor Gregoire recently wrote a letter to USFWS requesting that more time be given on the decision to federally list the gophers or not to list them. This letter was much appreciated, but bottom line the gophers should never have been listed by WDFW in the first place.

Now USFWS is most likely moving forward with the proposed listing, again based on no science and bad math. USFWS have been hand fed miss-information from certain staff at WDFW. USFWS is supposed to give the state some credibility in its request to not list a species. This request was made from the Governor and WDFW and USFWS is ignoring it.

There are also huge inconsistencies amongst the local jurisdictions and the WDFW staff serving those local jurisdictions on how they manage the Mazama Pocket Gopher. There are staff at WDFW that have just lately been trying to work with us, WDFW Director Phil Anderson, Deputy Wildlife Program Director Greg Schirato, and Region 6 Wildlife Program Manager Mick Cope and we greatly appreciate their help. The District Wildlife Biologist for Thurston County and several of her staff need to be fired for pushing the Mazama Pocket Gopher issue to the point we are at now and with no science supporting them. They are also clearly calling mounds moles when they are clearly gophers and we have proven it. I feel they

are doing this just to keep trying to move the gopher issue further and try to keep them from being taken of the state's threatened species list.

You might be asking why am I saying anything and working so hard to get the gophers de-listed, because Mazama Pocket Gopher Surveys and Habitat Management Plans are a large part of my business. The listing is just simply wrong. There was no science behind the listing and it is having a very detrimental effect on the landowners, local municipalities, local jurisdictions and costing the taxpayers a large amount of money in the counties where gophers are found. It has cost millions of dollars.

If you have any questions or would like to talk further about this subject please let me know. Thank you for your time and consideration into this matter.

Sincerely,

Key McMurry

Key McMurry

Key Environmental Solutions, LLC.
Key McMurry / Owner Professional Stream + Wildlife
Biologist

[REDACTED]

Raymond, WA 98577

360-[REDACTED] Office

360-[REDACTED] Cell

[REDACTED] Keyenvironmentalsolutions.com

May 20, 2013

Tim Romanski
US Fish and Wildlife Service
Washington Fish and Wildlife Office
510 Desmond Dr. SE
Suite 102, Lacey, WA 98503

RE: Thurston County Prairie HCP—EIS

My name is Kara Tebeau, and I grew up in the East Olympia area of Thurston County, where my family resides. I currently live in Portland, Oregon where I am a student, but consider myself a permanent resident of Olympia. I enjoy visiting the prairie reserves in our area, and have personally observed and appreciated multiple species proposed to be covered under this plan. I have on several occasions volunteered as a community member on the prairies to assist in seed collection for ongoing propagation efforts at Glacial Heritage and the Mima Mounds. The following comments represent my preliminary concerns with the proposed Thurston County Prairie Habitat Conservation Plan. In particular, I raise issues related to mitigation measures, incentives for rural landowners, the no-surprises policy, and the inclusion of species recovery objectives as part of the plan's biological goals.

Habitat Conservation Plans are a means for the County to attain an incidental take permit for multiple species, which will allow it to permit otherwise lawful development that would be expected to impact listed species. Section 9 of the Endangered Species Act prohibits take of any fish or wildlife species listed under the ESA. 16 U.S.C. § 1538. Habitat Conservation Plans are required under Section 10(a)(2)(A) of the ESA for applicants seeking incidental take exemptions from the section 9 prohibition. 16 U.S.C. § 1539. An HCP, under 50 CFR 17.32(b)(1) must include information on:

(1) Impacts likely to result from the proposed taking of the species for which permit coverage is requested; (2) Measures the applicant will undertake to monitor, minimize, and mitigate such impacts; the funding that will be made available to undertake such measures; and the procedures to deal with unforeseen circumstances; (3) Alternative actions the applicant considered that would not result in take, and the reasons why such alternatives are not being utilized; and, (4) Additional measures FWS or NMFS may require as necessary or appropriate for purposes of the plan.

In order to issue the Incidental take permit, the Service must determine the following, under the criteria of 50 CFR 17.32(b)(2):

(A) The taking will be incidental. (B) The applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking. (C) The

applicant will ensure that adequate funding for the HCP and procedures to deal with unforeseen circumstances will be provided. (D) The taking will not appreciably reduce the likelihood of survival and recovery of the species in the wild. (E) The applicant will ensure that other measures that the Services may require as being necessary or appropriate will be provided. (F) The Services have received such other assurances as may be required that the HCP will be implemented.

Mitigation for Habitat Loss

The county is required to mitigate habitat loss from development; The handbook provides that mitigation can occur in several ways: acquisition of existing habitat, protection of existing habitat through conservation easements, enhancement or restoration of disturbed or former habitats, prescriptive management of habitats to achieve specific biological characteristics, and the creation of new habitats. HCP Handbook at 3-22. In Thurston County, most of the land that supports prairie species is owned by private owners. Critical Areas Ordinance Fact Sheet; June 21, 2012.

Comment 1: What opportunities for land-owner incentives can be included in the HCP? Already, the county has developed an Open Space Tax program and a Transfer of Development Rights program, which benefit owners of farmland, by lowering property tax and allowing them to transfer the right to develop to higher density areas. Can these approaches be adapted to suit owners of prairie land, by incentivizing ToDR (from prairie land to non-prairie land) or tax breaks for owners who elect to restore the prairie character of parts of their property?

Comment 2: Other HCPs have relied on market- based plans for habitat conservation, by allowing private owners to create conservation credits by dedicating and enhancing habitat on their land, and selling the credits. This would provide an incentive for private landowners to dedicate and restore habitat on their land for their financial benefit. Would it be feasible to incentivize this type of restoration program via the HCP in privately owned areas near established prairie habitat to create more habitat continuity?

Comment 3: The HCP has the opportunity to mitigate through creating habitat or restoring degraded habitat. With habitat such as prairie (as opposed to old growth forests), the land is much easier to manipulate to create the desired habitat. As a mitigation technique that can help to create a net positive impact on covered species, the HCP should rely heavily on habitat restoration where possible (in addition to acquisition and protection).

Comment 4: With much prairie land and sensitive habitat occurring on military bases, will the HCP provide a means by which the county and base collaborate to reduce incidental take to the maximum extent practicable?

Comment 5: In order to restore prairie areas and sustain them as grasslands, conservation crews must employ the use of prescribed fire. Will the HCP include a provision to allow incidental take for such restoration techniques?

The No- Surprises Policy:

The no-surprises policy provides a risk-shifting measure that benefits land-owners by providing the assurance that in negotiating “unforeseen circumstances” provisions for HCPs, the FWS and NMFS shall not require the commitment of additional land or financial compensation beyond the level of mitigation which was otherwise adequately provided for a species under the terms of a properly functioning HCP. Moreover, FWS and NMFS shall not seek any other form of additional mitigation from an HCP permittee except under extraordinary circumstances. HCP Handbook at 3-29.

Non-listed species may be included in an HCP, and if adequately covered by the plan (meaning, treated as if it were a listed species under the ESA), would be included in this “no surprises” policy. Habitat Conservation Planning Handbook at 3-30. An HCP can provide provisions for changed circumstances.

Given this policy, I have developed the following questions concerning the proposed Thurston County Plan:

Comment 1: With continuing global climate change, will the HCP be required to include contingent mitigation strategies pertaining to differing climate scenarios which may play out over the several decades during which this plan will be in place? With sub-populations of species like the Streaked Horned Lark so low in number, the potentially dramatic impact of climate change should be accounted for within mitigation responsibilities. In other words, climate change impacts on populations should not be considered an “unforeseen circumstance” which exempts the applicant from further mitigation responsibilities under the “no surprises” rule.

Comment 2: Given the large number of species proposed to be “covered” under the plan-- a number of which are not yet listed or proposed-- has enough biological information been gathered about these species to lock in a long-term plan with built-in assurances?

Comment 3: The plan is proposed for a 30 to 50 year time span, during which the no-surprises rule would be in effect. Would a shorter-term plan better serve populations which some researchers predict may be on the brink of extinction within only a couple of decades? For example, a study by Pearson et al. (2008) found that the Streaked Horned Lark population in Washington is declining by 40% per year.¹ With such a drastic downward trend, is it prudent to lock in assurances related to this species for up to a half century?

The Recovery of the Listed Species

According to the Habitat Conservation Planning Handbook, HCPs are not required to recover a listed species or contribute to the recovery objectives outlined in their recovery plan. HCP handbook at 3-20. However, applicants are encouraged

¹ Pearson, S.F., A.F. Camfield, and K. Martin. 2008. Streaked Horned Lark (*Eremophila alpestris strigata*) fecundity, survival, population growth and site fidelity: Research progress report. Washington Department of Fish and Wildlife, Wildlife Science Division, Olympia, WA.

to take recovery into account when developing their plans, to create a net positive effect on the species. *Id.*

Comment 1: Since the proposed HCP covers a large portion of Thurston County, it also covers a large amount of endemic Mazama Pocket Gopher subspecies range, as well as one of only a handful of nesting regions for Streaked Horned Lark in Washington State. Thus, if the Thurston County HCP does not include recovery planning in its biological goals for species with geographically limited ranges such as those, I am concerned that there will be little other opportunity for meeting the recovery goals of those species. I would like to see recovery goals aggressively pursued in the developing HCP, since it covers such a large portion of the species' ranges.

Comment 2: It is possible that if Thurston County's plan does not incorporate recovery goals, the county would be ineligible for an incidental take permit, because the issuance of a section 10 permit must not appreciably reduce or jeopardize listed species. In this case, the proposed HCP may encompass so much of the species' ranges, that without recovery goals built into the HCP, its operation would contribute to the species' sharp decline.

I support comprehensive planning to proactively address the needs of multiple prairie species. As a concerned citizen of the East Olympia area, I would like to see the proposed HCP include robust provisions for habitat restoration, include species recovery as part of its biological objectives, incentivize private habitat restoration and protection, and create a plan that is flexible enough to respond adequately to the precipitously declining numbers of local populations.

Thank you for your consideration,

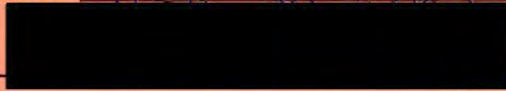
Kara Tebeau
Resident of Olympia, WA 98513

WRITTEN COMMENT FORM

PRINTED NAME:

Rick Nelson

ADDRESS:



Olympia WA 98501

need assurance of protection law &
rules change how do we hold government
accountable
no outreach to landowners has occurred

WRITTEN COMMENT FORM**PRINTED NAME:** MEL MURRAY**ADDRESS:** Tumwater School District Tumwater 98512

Please consider operation and maintenance of school
district grounds and fields for incidental take.

These activities are necessary to protect the community's
investment in the schools for their children's education.

Regular activities including mowing, thatching, aerating,
fertilizer^{& herbicide} application, tree planting & replacement, fencing & sports
equipment (goals, backstops, etc) installation, installation or replacement
of irrigation & and drainage systems, lighting, etc.

WRITTEN COMMENT FORM

PRINTED NAME: Jerry Tiff

ADDRESS: Yelm

① I do think that "natural selection" is being
overlooked in the species you have selected
for coverage

WRITTEN COMMENT FORM

PRINTED NAME: Jerry TEE

ADDRESS: _____

- (1) I wonder if we truly have an accurate gopher count?
- (2) The fact that land ownership is only becoming stewardship, with an owner unable to sell or purchase his holding because of this ^{alleged} gopher situation.
- (3) More control of private property by government is quite unwelcome.

NEPA Scoping Meeting

April 6, 2013

South Puget Sound Prairie
Habitat Conservation Plan

WRITTEN COMMENT FORM

PRINTED NAME: Key McMuray - KES

ADDRESS: [REDACTED], Raymond WA 98577

1. Mason County should be also heavily involved
& included in the listing -

2. WDFW says gopher's are in Lewis county
why isn't Lewis county residents required
to do recon's, survey's, HMP & set-aside, where
there is prairie soils.

NEPA Scoping Meeting

April 6, 2013

South Puget Sound Prairie
Habitat Conservation Plan

WRITTEN COMMENT FORM

PRINTED NAME: Key McMurry - KES

ADDRESS: [REDACTED], Raymond WA 98577

1. The Mazama Pocket Gopher should never have
been listed by the state (WDFW)
2. The state listed the MPO based the listing
solely on the core airport area study - Not the entire
habitat range which includes all of Thurston, Lewis,
Mason, Grays Harbor & Clark County
3. How do you write an HCP on species that
are not listed ~~on~~ federally.

NEPA Scoping Meeting

April 6, 2013

South Puget Sound Prairie
Habitat Conservation Plan

WRITTEN COMMENT FORM

PRINTED NAME: Kay McMurry - KES

ADDRESS: [REDACTED] Raymond WA 98577

1. Why even mention the listing of the MPG to the public without first doing the genetic testing & the ~~add~~ additional surveys first. These should have done prior going down the listed path

2 Thurston County Planning Dept & WDFW are not consistent. One landowner may be required to do a recon or survey & the adjacent landowners are not required - even if these adjacent landowners have prairie or MPG.

NEPA Scoping Meeting

April 6, 2013

South Puget Sound Prairie
Habitat Conservation Plan

WRITTEN COMMENT FORM

PRINTED NAME: Key McMurry - KES

ADDRESS: [REDACTED], Raymond WA 98577

1. ~~#~~ If a decision is not going to be made 2015
the landowners will be held to the current poor
regulations - which were based on no science + bad
math

2. Why isn't the science being done first, prior
to even proposing listing of the MP6

3. With the proposed listing^{MP6}, this has created a lot
of fear + people in Thurston County are out killing MP6's
frequently

NEPA Scoping Meeting

April 6, 2013

South Puget Sound Prairie
Habitat Conservation Plan

WRITTEN COMMENT FORM

PRINTED NAME: Key McMurry - KES

ADDRESS: [REDACTED], Raymond WA 98577

1. The 3 to 1 mitigation requirement was not science based, it was ^(WDFW) strictly a policy call from WDFW. Michelle Tirhi was record it under oath stating the 3 to 1 was a policy call & that there was no science behind the 3 to 1

2. We are finding gopher's frequently in areas that are not Prairie, christmas tree farms, Capitol Forest, Golf Course, clear-cuts, & heavily disturbed areas

NEPA Scoping Meeting

April 6, 2013

South Puget Sound Prairie
Habitat Conservation Plan

3. Shouldn't be doing an HCP at this time.

WRITTEN COMMENT FORM

PRINTED NAME: Ray Murray - KES

ADDRESS: [REDACTED], Raymond WA 9857

1. Prairies have been vanishing mainly around the airport & right along I-5, not in the rest of the county.

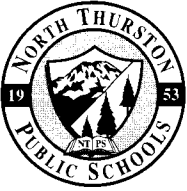
2. Why isn't Mason & Lewis county involved with the proposed listing - WDFW includes them.

3. What about ~~cemeteries~~ cemeteries where gophers are found? Adjacent landowner's have gopher's & have to do surveys, AMP's & set aside.

NEPA Scoping Meeting

April 6, 2013

South Puget Sound Prairie
Habitat Conservation Plan



Rajinder S. Manhas, *Superintendent*

NORTH THURSTON PUBLIC SCHOOLS

305 College Street NE • Lacey, WA 98516
(360) 412-4413 • FAX (360) 412-4410

March 28, 2013

U.S. Fish and Wildlife Service
Washington Fish and Wildlife Office
510 Desmond Dr. SE, Suite 102
Lacey, Washington 98503-1263

Attention: Mr. Tim Romanski

Re: Thurston County Prairie HCP - EIS

Mr. Romanski:

North Thurston Public Schools recently received notice of the April 6, 2013 meeting at the Thurston County Fairgrounds that has been scheduled by your organization for the purpose of soliciting public comments on the Thurston County Habitat Conservation Plan.

While the District is very interested in the subject, and in protecting the public's investment in its current facilities and future school sites, given the short notice and the choice of a weekend during the traditional Spring Break vacation, representatives of NTPS will be unable to attend. We understand another opportunity to comment has been requested and we echo that request. Our interest in participating is high and we intend to continue to be active in the process.

We at North Thurston Public Schools feel strongly that public school systems are critical public facilities. As such, they deserve special consideration regarding the possible adverse economic effects that an "endangered species" determination likely brings to their ability to fully develop facilities and meet their constitutional mandate. This is a significant community development issue for both public and private entities. With this in mind we hope you'll provide ample opportunities for those entities to provide input and information in another meeting.

Sincerely,

A handwritten signature in black ink that reads "Raj Manhas".

Raj Manhas
Superintendent

c: John Bash, Deputy Superintendent, North Thurston Public Schools
Mike Lavery, Director of Construction and Design, North Thurston Public Schools
David Schaffert, Executive Director, Thurston County Chamber of Commerce

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Tumwater School District

Mike Kirby
Superintendent

621 Linwood Avenue SW • Tumwater, WA 98512-6847
(360) 709-7000 • Fax (360) 709-7002 • www.tumwater.k12.wa.us

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Business:
(360) 709-7010
Personnel:
(360) 709-7020
Special Services:
(360) 709-7040
Capital Projects:
(360) 709-7005

May 14, 2013

Tim Romanski
U.S. Fish and Wildlife Service, Washington Fish and Wildlife Office
510 Desmond Drive SE, Suite 102
Lacey, WA 98503-1263

U.S. FISH & WILDLIFE SERVICE
WFOW
MAY 20 2013
LACEY, WA
RECEIVED

Re: Thurston County Prairie Habitat Conservation Plan
Environmental Impact Statement Public Comments

Dear Mr. Romanski:

The Superintendents of Griffin School District, North Thurston Public Schools, Olympia School District, Rochester School District, Tumwater School District and Yelm Community Schools submitted the attached letter as a public comment regarding the proposed listing of prairie species under the Endangered Species Act.

I have discussed this with the other superintendents and the concerns we expressed for that action also apply to the Thurston County Habitat Conservation Plan. Our ability to educate the children of Thurston County is dependent on the normal maintenance and operations activities described in the letter. We ask that these activities, such as they may incidentally harm a sensitive prairie species, be allowed under the County Habitat Conservation Plan.

We are committed to working with County, State and Federal staff so we may help them to understand our schools' needs and they may help us continue to provide great education and opportunities for the children of Thurston County.

Sincerely,

Mike Kirby, Superintendent
Tumwater School District

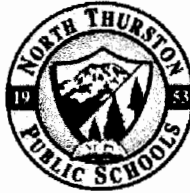
Attachment

cc: Cathy Wolfe, Thurston County Commissioner
Sandra Romero, Thurston County Commissioner
Karen Valenzuela, Thurston County Commissioner
Phil Anderson, Director, Washington Department of Fish & Wildlife
Dick Cvitanich, Olympia School District Superintendent
Kimberly Fry, Rochester School District Superintendent
Raj Manhas, North Thurston Public Schools Superintendent
Greg Woods, Griffin School District Superintendent
Andy Wolf, Yelm Community Schools Superintendent

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"Continuous Student Learning in a Caring, Engaging Environment"



April 24, 2013

Public Comments Processing
Attn: FWS-R1-ES-2012-0088
Division of Policies and Directives Management
U.S. Fish and Wildlife Service
4401 N. Fairfax Drive, MS 2042-PDM
Arlington VA 22203

Re: Public Comment on Proposed ESA Listing of the Mazama Pocket Gopher,
Docket No. FWS-R1-ES-2012-088

To Whom It May Concern:

As the Superintendents of Griffin School District, North Thurston Public Schools, Olympia School District, Rochester School District, Tumwater School District and Yelm Community Schools, we are concerned about the proposed listing of the Mazama pocket gopher as an endangered species. Our school districts combined enroll 38,000 of the 40,000 students in Thurston County schools and the proposed listing will have a significant impact on these students. We fear that where and how our students learn will be tied up by regulatory requirements, and that maintenance and operations of current facilities will become impossible within this environment.

As many have stated before, the scientific research used in the listing proposal is questionable. We request that USFW use the best available science and commercial data in making its determination and not rush towards a decision. At a minimum, any proposed listing should be deferred as provided for under the Endangered Species Act, in order to allow time for ongoing important taxonomic studies about the species to be completed and fully reviewed.

5/6/13 - mailed



If the Mazama pocket gopher and other prairie species are finally listed as threatened as proposed, and critical habitat for those species is designated as proposed within our Cities and Urban Growth Boundaries, then consideration needs to be given to expand the proposed exemptions by special rule under section 4(d) to include normal, ongoing activities on school grounds in Thurston County. We strive to preserve the investment our communities have made in their schools. Because of this, there are many activities required in order to maintain safe grounds and fields for student education, fitness, athletics and also community use. Since these activities take place on established school grounds, they are unlikely to produce even inadvertent take of the species.

The following normal activities will have minimal impact on the survival of the species, either individually or through degradation of habitat, and should be considered for addition to the proposed special 4(d) rule set out in the proposed listing:

1. Athletic and Play Fields:

- a. Weekly mowing between March and October.
- b. Thatching and aerating in spring or summer.
- c. Deep or slit tining and sanding multiple times in summer.
- d. Fertilizer, pesticide and herbicide application as needed.
- e. Weeding by pulling or burning as needed.
- f. Filling of holes as needed.
- g. Replacement of turf as needed.
- h. Trenching for irrigation, either new or repairs, as needed.
- i. Trenching for installation of drainage, either new or repairs, as needed.
- j. Installation or replacement of sports equipment (goals, backstops, bleachers, etc.) as needed.
- k. Installation or replacement of field lighting as needed.
- l. Installation or replacement of fencing as needed.



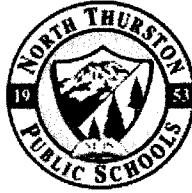
- m. Installation of temporary or permanent restroom facilities as needed.
- n. Soils testing and amendment.
- o. Rodent and pest removal (moles and rats for example).
- p. Turf installation.
- q. Preparation for a sports season: infield dragging and line marking.

2. Lawn and Landscaping:

- a. Weekly mowing between March and October.
- b. Thatching and aerating in spring.
- c. Fertilizer, pesticide and herbicide application as needed.
- d. Weeding by pulling or burning as needed.
- e. Replacement or installation of shrubs and trees as needed.
- f. Pruning or tree removal as needed.
- g. Soil testing and amendment.

3. School Sites:

- a. Trenching for new utilities as needed (generally on an emergency basis).
- b. Installation of perimeter security fencing as needed.
- c. Instructional gardening.
- d. Installation of modular classrooms (portables) as allowed by the current Special or Conditional Use Permit or school district Capital Facilities Plan.
- e. Maintenance of storm ponds, storm ditches, and non-specific ditches, including mowing, fencing and cleaning.
- f. Well and septic system maintenance and repair.
- g. Construction of small storage buildings for emergency supplies, sports equipment and maintenance equipment.



- h. Construction or installation of art, small buildings, and fire pits, etc. by student or parent groups.
- i. Installation and maintenance of playgrounds and equipment.

These routine school maintenance activities are not materially different in scope and impact to the Mazama pocket gopher and other prairie species and habitat than the types of single-family residential, airport, agricultural, and other non-commercial activities set out in the proposed 4(d) rule. These routine activities are therefore equally justified as those currently proposed for exemption in that they provide for long-term conservation needs of the species through ensuring distribution of the species across private and public lands, as they discourage conversions of landscape into unsuitable habitat. Moreover, these activities are required for our established schools. If we do not maintain our grounds, they will quickly degrade and pose safety risks to our students and community users. We need to keep our grounds in a safe and useful condition to allow our students opportunities for outdoor learning. We feel that these same concerns will negatively impact other smaller school districts in the county (and neighboring counties) and hope that you will extend exemptions beyond just our three large districts.

In addition, we are very concerned that limitations imposed under Section 9 of the Endangered Species Act will have significant adverse impact on future school development in the absence of a comprehensive, and as yet undeveloped, site specific or County-wide HCP. Based on our extensive collective experience with school development and critical area protections, existing regulatory mechanisms are more than adequate to protect the species without benefit of additional federal protection. Our Districts already do long-range planning and permitting under the rules of Washington's Growth Management Act (GMA), Thurston County's Critical Areas Ordinance (CAO) and the Olympia, Lacey and Tumwater CAO's, all of which give ample protection to critical habitat and threatened species. In addition, the Washington Office of Superintendent of Public Instruction (OSPI) has further rules regarding long-range planning, site selection criteria and construction requirements for schools.



Future school sites, especially those that have already been purchased, are also a major concern. We have been diligent in looking to the future and making investment in these sites. Now our foresight is in jeopardy. Because the proposed listing impacts not only on our future school sites but also Thurston County's ability to accommodate future expected population growth given the extent of gopher occupancy and potential habitat within our Cities and Urban Growth Areas, our districts are entirely unable to plan with certainty how and where we will grow. In some cases there are neighborhoods that are waiting for the vacant land to be developed in to a school so the children do not need to travel across town. School construction requires bond approvals with a 60% super-majority, so the effort and proof of need required for new schools is greater than other projects. Without being able to state with certainty where and when we are going to build new schools, the super-majority hurdle for new bonds may become insurmountable.

We are hopeful that our concerns are not falling on deaf ears. We care about our schools and our communities. We work together in order to educate the students put in our care and keep our communities strong.

Sincerely,

Dick Cvitanich, Superintendent
Olympia School District

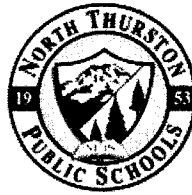
Raj Manhas, Superintendent
North Thurston Public Schools

Mike Kirby, Superintendent
Tumwater School District

Kimberly M. Fry
Rochester School District

Greg Woods
Griffin School District

Andy Wolf
Yelm Community Schools



Copy: Cathy Wolfe, Thurston County Commissioner
Sandra Romero, Thurston County Commissioner
Karen Valenzuela, Thurston County Commissioner
Stephen H. Buxbaum, Mayor, City of Olympia
Virgil Clarkson, Mayor, City of Lacey
Pete Kmet, Mayor, City of Tumwater
Phil Anderson, Director, Washington Department of Fish & Wildlife



WFWOComments, FW1 <wfwocomments@fws.gov>

Thurston County Prairie HCP_EIS

2 messages

Andrew Barkis [REDACTED]@hometownpm.com>
To: "WFWOComments@fws.gov" <WFWOComments@fws.gov>

Tue, Apr 30, 2013 at 11:47 AM

Dear Mr. Romanski:

My name is Andrew Barkis. I am a small business owner in the Thurston County region. I am writing to express my opposition to the proposed listing of the Mazama Pocket Gopher as an Endangered Species. Having lived in the area most of my life, I have seen the growth and changes that have occurred in our region. I have witnessed firsthand the destructive powers wielded by Federal and State Agencies when it comes to placing protections on Animals and things over the people who live and work here. The best example of this is the Spotted Owl issue.

Much has been learned over the many years since about how we can co-exist with nature and accommodate growth, development and business, while preserving the environment that we live in. The Environmental community, Scientific community and Business community has come together time and time again to develop working solutions to the issues at hand. Only when the issue swings radically one way or the other do we run into problems. This is one of those potential problems. If the Mazama Pocket Gopher is listed as proposed, irreversible damage will be done to the people of this area. Damage in the way we work, and enjoy the land in which we live. Damage to the fragile economic base that we have. The economic base that supports our schools, and government services.

All of these issues must be taken into consideration.

As a former candidate for Thurston County Commissioner, and one who has been involved at every level in the community, I have learned much of this issue. I have studied the impacts. I have seen the solutions created. I have watched the battles and the compromises put in place at the county level to preserve the "Critical Areas of our region, to include the habitat of the Mazama Pocket Gopher. I believe the adequate protections and solutions are in place at the local level and a federal mandate is not necessary.

The science has been presented. The facts are very clear on this one. Please take this into consideration as you move forward with the process.

I appreciated your receipt of mine and many others who have presented opposition to this most important issue.

Please feel free to contact me if you have any follow up questions on my position.

Sincerely,

Andrew K. Barkis

Owner/Broker

Hometown Property Management

Find us on [Facebook!](#)

[REDACTED]@hometownpm.com

360 [REDACTED]





Thurston County Prairie HCP - EIS

2 messages

jimsvision [REDACTED]@gmail.com>
To: WFWOComments@fws.gov

Fri, May 3, 2013 at 2:36 PM

To whom it may concern:

I am writing to comment about the proposal by the US Fish and Wildlife Service to list Mazama Pocket Gopher as an endangered species. My understanding is that this has come about due to a "settlement" with the Wild Earth Guardians. I continually hear and read about organizations like this that appear make their living by filing incessant law suits that take advantage of legal loopholes regarding the ESA. I am alarmed at this fact, and alarmed that the USFWS is allowing itself to be manipulated by such organizations.

I could go on about this, but a recent Forbes article does a very good job of explaining these abuses.

"The Radical Abuse of the ESA Threatens the US Economy"

<http://www.forbes.com/sites/davidblackmon/2013/02/18/the-radical-abuse-of-the-esa-threatens-the-us-economy/>

"In its original construct, the ESA required the U.S. Fish & Wildlife Service to "when prudent", designate the species' "critical habitat" along with a listing, "and economic and other impacts of designation were to be considered when deciding on boundaries."

This requirement to take economic and other significant impacts into consideration when determining what constitutes "critical habitat" was a critical component of the law that balanced its application and helped prevent its abuse by radical elements until the requirement was removed in 1982. Since that unfortunate decision, far-leftwing anti-development organizations like Wild Earth Guardians, Earth Justice, and The Center for Biological Diversity, among others, have increasingly abused the ESA as a tool for slowing or even halting any form of human industrial progress in some regions."

This abuse has continued for far too long. Designating private property and farms as critical habitat for

species that are being forced into the ESA endangered or threatened status by extremist groups like those mentioned above amounts to the regulatory taking of private property without compensation. These actions are harmful to the property owners and the local economies. Those affected will be extremely resentful of the action taken against them and the species that caused it. Their ability to use their property for normal and customary purposes is stripped away by suffocating government regulations and their property becomes worthless in the normal real estate market. As these abuses continue to occur, it is likely that significant class-action lawsuits and questions of abuse of Constitutional rights (5th Amendment as related to private property: "... nor shall private property be taken for public use, without just compensation.") will come into play. Those affected by the suffocating government regulations resulting from actions like those already taken by Thurston County to protect the Pocket Gopher have suffered financially and emotionally from the regulatory taking of the use of their private property and loss of property value with absolutely no compensation.

Please view two actual examples of how government regulations put in place to protect a pocket gopher in Thurston County has had extreme negative impact on the property owners:

<http://www.youtube.com/watch?v=7iCHh5TRMw0>

<http://www.youtube.com/watch?v=dcwNOb9sYfE&feature=related>

What is happening is wrong. Any reasonable person can see that these government actions are wrong and abusive. Economic and personal impacts must be taken into account when considering actions dealing with any threatened or endangered species. "The best way to preserve threatened and endangered species is to engage communities and create collaboration. Legislators who want to protect a species should seek out ways to bring together seemingly disparate groups and individuals around that goal." ("Common Sense Conservation". Freedom Foundation – 2012). We need to save species without hurting people or the surrounding economy.

I am asking that you push back against radical groups that abuse the ESA, and make decisions based on sound and unbiased science. Conduct the studies needed and take the time needed to do those studies. The Wild Earth Guardians appear to want to avoid allowing enough time to study the situation; why is that? Regardless of the outcome, do not allow any regulations to negatively affect private property rights or private property values without compensation; to do so will undermine a basic element of our freedom in this country.

Thank you.

Sincerely,

Jim Goldsmith

Olympia, WA



WFWOComments, FW1 <wfwocomments@fws.gov>

Thurston County Prairie HCP - EIS

1 message

clicketyclack@riseup.net [REDACTED]@riseup.net>
To: WFWOComments@fws.gov

Mon, Apr 8, 2013 at 9:32 PM

I am infinitely more concerned with the preservation of our dwindling prairie habitats and the species they support than the economic development of Thurston County. It is mind boggling to me that it isn't obvious that the very existence of other species should come above further encroachment on these fragile habitats by urban sprawl that only feeds itself. We should be doing anything and everything we can to preserve our prairies in the South Sound region.

Ben Cody
Tacoma, WA



WFWOComments FW1 <wfwocomments@fws.gov>

Thurston County Prairie HCP - EIS

2 messages

[REDACTED]@aol.com [REDACTED]@aol.com>

Tue, Apr 30, 2013 at 1:15 PM

To: WFWOComments@fws.gov

Cc: [REDACTED]@gryphonranch.com, [REDACTED]@aol.com

Dear Sirs,

REF: Pocket Gopher as an "endangered species"

I am a small Alpaca farmer in Lewis county. We are also trying to grow some of our own vegetables and fruit. We are NOT very happy about the effort of making ANY gopher or mole an "endangered species". We are also NOT HAPPY that we might have to ask permission to use our own land in farming efforts; i.e. plowing, digging up garden areas, mowing hay, etc. Please consider this far reaching change you are trying to make and the effect it will have on all small farmers in the future. The government should be trying to help the farmers in this terrible economic time, not setting even more rules and regulations.

I would ask that you **Please** do the following:

- (1) to classify farming and agriculture as an 'exempted activity' (not requiring permit) under any listing that you may make.
- (2) to clarify that impacts to the gopher population as a result of farming and agricultural activity will be deemed to be an 'incidental take'. This will serve to clarify that such activity is not illegal and no civil or criminal liability should attach to it.
- (3) to define "agriculture" broadly.

Thank you for listening to me. I hope you consider carefully the full effects of this ruling, this may backfire on the general area. According to what I am reading about the subject, these gophers are all over the place anyway. Obviously people are not affecting them....they are multiplying like all underground diggers and will take over all of Western Washington and move on up to Canada ultimately if they are "protected". NOT GOOD.

Best regards,

Sandra Blake

Around the Bend Alpacas
(360) [REDACTED]



Thurston County Prairie HCP - EIS2 messages

Dave Pyle [REDACTED]@hotmail.com>
To: WFWOComments@fws.gov

Sun, May 19, 2013 at 8:21 PM

To Whom it May Concern,

I am writing with regard to Thurston County's HCP.

As a family of landowners, we pride ourselves on taking care of the resources we have been given to steward. I understand we need to be good stewards of national resources and that it is an extremely complex undertaking. While we may not be directly affected by the newest proposed listings and Thurston County's HCP since it deals primarily with prairie lands, the direct effects on others and the indirect effects on us are great. The increased regulations are becoming unbearably burdensome on private landowners. If a person is unreasonably restricted from using their own property without compensation, it is simply theft (although I also understand that it is the determination of "unreasonable" that is debatable).

No new species should be listed as endangered or threatened until the USFWS and/or Thurston County figure(s) out how to fund private landowners from the "incidental take" of private land or land use. Even proposed species, candidate species and non-listed species are being covered by the Thurston County HCP. Thus, private landowners are having land stolen or land use regulated for species that are not even endangered. Enough is enough.

As well, the burden of proof is put on the private landowner to prove that a species is NOT on their property and uses broad and general criteria (such as soil maps) to insist that certain species could inhabit areas. The financial responsibility is also placed on the private landowner. These are still difficult financial times. Private landowners (who are taxpayers) cannot and should not have to afford to pay for studies to prove that certain species don't exist or aren't threatened on their property.

I would suggest that the best way to preserve these species is through voluntarily donated land. That would be a win-win. If not enough people are willing to donate land, that might tell us something.

We might find landowners more willing to work with county, state and federal officials and offices were the regulations not so overly burdensome.

Sincerely,

Dave Pyle

360. [REDACTED]



WFWOComments FW1 <wfwocomments@fws.gov>

Thurston Co Prairie HCP-EIS

2 messages

Mark Carlson <Mark@mdcarlson.com>

Mon, Apr 29, 2013 at 12:40 PM

To: "WFWOComments@fws.gov" <WFWOComments@fws.gov>

Cc: Cedarvillefarms [REDACTED]@aol.com>

Dear Tim Romanski, I'm contacting you as a concerned citizen urging you to NOT list the Mazama pocket gopher as an endangered species. Please consider the 2011 Krippner Report and WDFW data which contradict this action. I appreciate the WildEarth Guardians idealism, but please consider them for what they are, lunatic fringe with a non-common sense radical agenda. Listing this gopher and it's subspecies in Thurston and portions of Pierce Co. to the ESA would have dramatic negative consequences that will last long after you and I are gone. If this rodent is listed with ESA status please factor in that human population growth will continue as will the need for food production. Please consider classifying farming and agriculture as an exempted activity and any impact to gopher populations be deemed 'incidental take' and not illegal or subject to civil or criminal liability. Pasturage and tilling the soil to grow crops is compatible with the successful coexistence of gophers. Please consider the 'big picture' in this matter, there is plenty habitat for this rodent to exist in this area. No one who has an interest in wildlife, and especially those who have made it their career to be stewards of wildlife want a species to go 'extinct' on their watch, but not all species are meant to, or have 'earned' the adaptive capabilities to survive. Thank-you for your consideration in this complex issue. Sincerely, Mark Carlson BS(Gen Biology), MS(Zoology/Vet. Path)



WFWOComments, FW1 <wfwocomments@fws.gov>

Re: comment

1 message

jean public [REDACTED]@gmail.com>

Sun, Mar 24, 2013 at 6:55 AM

To: wfwocomments@fws.gov, tim_romanski@fws.gov [REDACTED]@emagazine.com [REDACTED]@earthjustice.org, [REDACTED]@greatoldbroads.org,

[REDACTED]@peer.org

Cc: speakerboehner <speakerboehner@mail.house.gov>, president <president@whitehouse.gov>

i support creating protected habitat for the prairie hcp. my comment is that the report on climate change needs to be part of this since so often this agency seems to not be aware that endless research has been done on the huge impact climate change has on animals species. i dont think the public should have to submit this endlessly since the us govt and its various agencies have done extensive work on how huge impact is coming to all animal species from climate change. please acquaint yourself with this exgtensive research on how hard it is on animals to continue to exist with climate change occurrennces. this comment is for the public record. jean public

On Wed, Mar 20, 2013 at 8:17 AM, Jean Public [REDACTED]@yahoo.com> wrote:

[Federal Register Volume 78, Number 54 (Wednesday, March 20, 2013)]
 [Notices]
 [Pages 17217-17218]
 From the Federal Register Online via the Government Printing Office
 [www.gpo.gov]
 [FR Doc No: 2013-06382]

 DEPARTMENT OF HEALTH AND HUMAN SERVICES

Health Resources and Services Administration

Agency Information Collection Activities; Proposed Collection;
 Comment Request

ACTION: Notice.

 SUMMARY: In compliance with the requirement for opportunity for public comment on proposed data collection projects (Section 3506(c)(2)(A) of Title 44, United States Code, as amended by the Paperwork Reduction Act of 1995, Pub. L. 104-13), the Health Resources and Services Administration (HRSA) publishes periodic summaries of proposed projects being developed for submission to the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1995. To request more information on the proposed project or to obtain a copy of the data collection plans and draft instruments, email paperwork@hrsa.gov or

call the HRSA Reports Clearance Officer at (301) 443-1984.

HRSA especially requests comments on: (1) The necessity and utility of the

[[Page 17218]]

proposed information collection for the proper performance of the agency's functions, (2) the accuracy of the estimated burden, (3) ways to enhance the quality, utility, and clarity of the information to be collected, and (4) the use of automated collection techniques or other forms of information technology to minimize the information collection

burden.

Information Collection Request Title: HRSA AIDS Education and Training Centers Evaluation Activities: (OMB No. 0915-0281)--Revision

Abstract: The AIDS Education and Training Centers (AETC) Program, under the Ryan White HIV/AIDS Program established by Title XXVI of the Public Health Service (PHS) Act, as amended, supports a network of regional and national centers that conduct targeted, multi-disciplinary education and training programs for health care providers treating persons with HIV/AIDS. The AETCs' purpose is to increase the number of health care providers who are effectively educated and motivated to counsel, diagnose, treat, and medically manage individuals with HIV infection, and to help prevent high risk behaviors that lead to HIV transmission.

As part of an ongoing effort to evaluate AETC activities, information is needed on AETC training sessions, consultations, and technical assistance activities. Each regional center collects information on AETC training events, and is required to report aggregate data on their activities to HRSA's HIV/AIDS Bureau (HAB). The data provides information on the number of training events, including clinical trainings and consultations, as well as technical assistance activities conducted by each regional center, the number of health care providers receiving professional training or consultation, and the time and effort expended on different levels of training and consultation activities. In addition, information is obtained on the populations served by AETC trainees, and the increase in capacity achieved through training events. Collection of this information allows HRSA's HAB to provide information on training activities and types of education and training provided to Ryan White HIV/AIDS Program Grantees, resource allocation, and capacity expansion. Trainees are asked to complete the Participant Information Form (PIF) for each activity they complete, and trainers are asked to complete the Event Record (ER).

Burden Statement: Burden in this context means the time expended by persons to generate, maintain, retain, disclose or provide the information requested. This includes the time needed to review instructions, to develop, acquire, install and utilize technology and systems for the purpose of collecting, validating and verifying information, processing and maintaining information, and disclosing and

providing information, to train personnel and to be able to respond to a collection of information, to search data sources, to complete and review the collection of information, and to transmit or otherwise disclose the information. The total annual burden hours estimated for this Information Collection Request are summarized in the table below.

The annual estimate of burden is as follows:

Average burden		Form		Number of	
Responses per	Total responses	per response	(in	Total burden	respondents
respondent		hours)	hours		
PIF.....					116,624
1	116,624	0.167	19,476.2		
ER.....					18,070
1	18,070	0.2	3,614.0		

Total.....		134,694
.....	134,694	23,090.2

The estimated annual burden to AETCs is as follows:

Responses per respondent	Total responses	Hours per response	Number of Total burden respondents hours
Aggregate Data Set.....			16
2	32	32	1024.0

The total burden hours are 24,114.2.

ADDRESSES: Submit your comments to paperwork@hrsa.gov or mail to the
HRSA Reports Clearance Officer, Room 10-29, Parklawn Building, 5600
Fishers Lane, Rockville, MD 20857.

Deadline: Comments on this Information Collection Request must be
received within 60 days of this notice.

Dated: March 12, 2013.
Bahar Niakan,
Director, Division of Policy and Information Coordination.
[FR Doc. 2013-06382 Filed 3-19-13; 8:45 am]
BILLING CODE 4165-15-P



WFWOComments FW1 <wfwocomments@fws.gov>

Pocet Gopher Listing in Thurston County, WA

2 messages

Ross Barkhurst [REDACTED]@hotmail.com>

Tue, Apr 23, 2013 at 12:51 PM

To: "WFWOComments@fws.gov" <wfwocomments@fws.gov>

I am writing to request your re-consideration of listing the pocket gopher in Thurston County. To the extent that these animals co-exist with agriculture, agriculture should be encouraged. Such listing could very well decrease agriculture and we know what happens next. Trees and brush take over or the land gets broken up and developed. Either way it is curtains for the gopher and more of our food comes from overseas where standards are very low.

Clearly they coexist with pasturage and airports. Much of our wildlife such as waterfowl survives at good numbers only with the availability of both types of agriculture also.

Listing by county and subspecies of pocket gophers is micromanaging at a level which seldom works out for the species or the public. We have programs which encourage retaining regimes such as old growth timber. This can be a tough sell when no production results. One time payment and that is it forever. Such programs when applied to production environments such as pasture land, and incenting certain % of pasture on farmland if that is helpful, must be tried for at least as long as you have studied the situation. Farmland can maintain certain species and produce at the same time. This should be taken advantage of, rather than condemning most active farming in a broad brush across an entire county.

Thank you for your attention,
Ross P. Barkhurst

[REDACTED]
South Bend, WA 98586



WFWOComments, FW1 <wfwocomments@fws.gov>

Fwd: April 6, 2013 Habitat Conservation Plan NEPA and SEPA Public Scoping Meeting

1 message

Romanski, Tim <tim_romanski@fws.gov>
To: FW1 WFWOComments <wfwocomments@fws.gov>

Wed, Apr 3, 2013 at 2:50 PM

Tim Romanski
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
Washington Fish and Wildlife Office
Branch Manager of Conservation and Hydropower Planning
510 Desmond Drive SE, Lacey, WA 98503
360.753.5823 (phone) 360.753.9518 (fax)

----- Forwarded message -----

From: Leigh, Michael [REDACTED]@spscc.edu>
Date: Sat, Mar 30, 2013 at 2:13 PM
Subject: April 6, 2013 Habitat Conservation Plan NEPA and SEPA Public Scoping Meeting
To: [REDACTED]@co.thurston.wa.us" <[REDACTED]@co.thurston.wa.us>
Cc: "Tim_Romanski@fws.gov" <Tim_Romanski@fws.gov>

The recent "notification" of the April 6 Habitat Conservation Plan NEPA and SEPA Public Scoping Meeting sent out by the Thurston County Planning Department took me over 10 minutes and online research to fully understand--despite the fact that I have a law degree and an advanced degree in biology and am familiar with the EIS process!

Why is a notice to the public so hard to understand? I see this ALL the time in governmental "notices", so it is not just your department. Is it intentional, to dissuade the public from paying attention? Or is it just that the people writing the "notifications" are so wrapped up in the lingo of their profession that they have forgotten how to write for the public? Or maybe the USFWS requires convoluted language in notifications of EIS/HCP scoping meetings?

Whatever the cause, I find it REALLY annoying--especially given the frequently expressed desire to get citizens more involved in their government.

What will it take to change this in the Planning Department? If it would help, I would be glad to volunteer my writing and/or proofreading services!

As an example of (what I hope is) a more understandable notice, I have copied below the description of the meeting that I wrote up for an event list that I email out to current and former students and community members interested in local environmental events.

As part of Thurston County's attempts to preserve prairie habitats, the County is working with the U.S. Fish and Wildlife Service to develop a Habitat Conservation Plan (HCP). As part of that process, Thurston County must prepare an Environmental Impact Statement (EIS). Representatives from USFWS and Thurston County will be on hand at this meeting to discuss the background of the project, and get feedback from the public. The purposes of the meeting are to identify the specific issues, activities, and alternatives that should be included in the EIS, and identify other plans and projects that might be relevant to the project. The information gathered will assist USFWS and Thurston County in developing a draft EIS. (Future public meetings and comment periods will address the actual content of the draft EIS and HCP as they are prepared.) For more information, go to http://www.co.thurston.wa.us/planning/prairieoak/prairieoak_home.htm or contact Tim Romanski (U.S. Fish and Wildlife Service) at (360) 753-5823 or at Tim_Romanski@fws.gov.

[REDACTED] h
Olympia, Washington 98501
360 [REDACTED] [REDACTED]@comcast.net

May 1, 2013

Tim Romanski
US Fish & Wildlife Service
US Fish & Wildlife Office
Suite 102
510 Desmond Drive SE,
Lacey, Washington 98503-1263
(Email: WFWOComments@fws.gov)

Re: Thurston County HCP-EIS

Greetings,

I am a long-time resident of Thurston County and my family operates a small family farm north of Olympia, Washington. I also serve on the board of the Thurston County Farm Bureau. Below are comments to the proposed Thurston County draft Environmental Impact Statement for its Prairie Habitat Conservation Plan and for the US Fish & Wildlife Service's (hereafter "FWS") proposed Endangered Species listing of the Manzama pocket gopher as well as the Streaked Horn Lark and the Taylor Checkerspot butterfly:

It appears that neither FWL nor Thurston County have adequately considered a number of issues which are involved in the development of Thurston County's Habitat Conservation Plan/EIS and FWL proposed Endangered Species Act listing of the Manzama Pocket Gopher. These issues, discussed below include whether the pocket gopher is actually 'threatened' as an Endangered Species, whether FWL has adequately consulted with other affected agencies and entities in proposing this ESA listing, and whether farming and agriculture should be exempted from 'incidental take' requirements and otherwise protected under a 4D rule if the FWL does indeed list the gopher.

1. From the perspective of the public in general and local farmers specifically, does the proposed listing of the pocket gopher raise concerns which are more serious than those which arise from the proposed listing of the bird and butterfly?

Yes! The gopher is a rodent which is a destructive pest. It undermines the land with its burrows, gnaws on utilities, and destroys crops. It also creates tunnels which other destructive animals, such as voles, can use to further access and destroy crops. The destructive nature of the gopher is therefore cumulative.

To compound the situation, natural predators of gophers (i.e. coyotes, bobcats, foxes, badgers, weasels) which serve to control their numbers have been reduced or eliminated in the South Puget Sound area. As a result, natural systems which keep gopher populations in check are out of balance.

Gopher activities listed as “benefits” are not necessarily beneficial. For example, the Washington State Department of Fish and Wildlife notes that “(a) typical pocket gopher can move approximately a ton of soil to the surface each year”. In fact, so can an avalanche or a flash flood, but this does not benefit a farmer trying to grow crops. (<http://wdfw.wa.gov/living/gophers.html>).

WSFWL also reports that it has observed gopher populations of up to 20 animals per acre. This means that a farmer may have to contend with 20 tons of soil per acre being shifted annually.

FWS staff are aware of the damage done to agriculture by gophers. “Gophers eat roots, bulbs, and other fleshy portions of plants they encounter while digging underground.” (<http://wdfw.wa.gov/living/gophers.html>)

FWS staff have visited local farms and have seen how farmers have to protect their crops by excavating their growing areas and lining them with metal mesh before replacing the soil to protect row crops from gophers that eat roots and tubers. These “underground fences” are expensive and time consuming to install.



Farmers have explained to FWS staff that just one gopher colony can easily destroy a year’s worth of work on several acres. This crop damage and the loss of income which it creates, will then threaten the farmer’s ability to maintain his/her farm and provide fresh wholesome food to the local community. Therefore, gophers invade the rural landscape and directly compete with local farmers for the land that they farm and the crops that they grow.

The gophers also compete with the other beneficial land uses, such as local schools, airports and transportation facilities, and power and utility companies.

Once gophers have established themselves, they are very difficult to get rid of. Aggressive eradication programs in Washington State and around the US, many supported by the Federal Government, have failed to eliminate gopher infestations.

In short, gophers are an invasive, expansive, and durable pest. They destroy flora, compete successfully with local fauna, and have successfully resisted organized efforts to kill them.

Therefore the gopher is fundamentally different than the transient lark and the butterfly. The latter do not invade farmland, undermine the land with their burrows, or destroy crops.

2. Are the gophers endangered?

Clearly, no! In fact, we cannot get rid of them even when we have tried. Even after years of work by the Federal Government and other entities to eradicate the gophers, they have survived and prospered. There is an abundance of gophers in the Thurston County area and their numbers appear to be rising not falling.

It therefore strains credulity for the Federal Government to now make a 180 degree about-face and claim that the gophers are endangered! And this claim descends into absurdity when FWL maintain that gophers are endangered only in the Thurston County area---while in other parts of Washington State as well as Oregon and California, aggressive gopher eradication programs continue.

FWS has offered no persuasive evidence to support its claim that the gopher is endangered, either from a factual or scientific standpoint. Rather, FWS has taken a conclusory approach to its proposed listing of the gopher under the Endangered Species Act. To support the listing, FWL is attempting to speak *ex cathedra*, using its own assertions as proof of that which it asserts.

Further, FWL has so far ignored or discounted overwhelming evidence which shows just the opposite—that the gopher population in Thurston County and throughout the South Puget Sound area is thriving. This evidence includes:

- Scientific studies, including the Krippner Report sponsored by the Olympia/Thurston County Chamber of Commerce.
- First hand observations made by FWL staff around Thurston County.
- Feedback from local property owners, school districts, municipalities and others regarding the abundance of local gopher populations which exist locally.
- Reports that illustrate the gophers' resiliency and attest to their ability to survive and prosper even in hostile environments, such as the artillery range at Joint Base Lewis McChord.
- Surveys and studies conducted by the Washington State Department of Fish & Wildlife Department.



Vol. 1 - Iss. 6 : November/December 2010
A bimonthly publication from the Ada County
Weed, Pest and Mosquito Abatement Department



Pest Facts

- Ada County Pest Control crews are wrapping up the 2010 gopher/rock chuck control season
- Although gophers don't hibernate, but they go become less active when the ground is frozen
- The 2010 Pest Control season started in February
- As of mid-October, Ada County Pest Control crews worked 2,625 requests for service
- Those work orders totaled a combined 27,541 acres
- A gopher can make several mounds in one day; each mound can be many feet apart
- A gopher's burrow can be found up to 20 inches below the ground surface
- Burrow systems include tunnels that branch off the main passageway; these are used for food storage and as nests for the rodents' young
- Burrowing activity is most intense in spring and fall, tapering off during summer months
- Typically a gopher's fur is the same color as the soil it's digging through
- Usually there is only one gopher per burrow system, except during breeding season and when females have their young
- Rock Chucks (or Yellow-Bellied Marmots) are the largest of the ground squirrels
- Rock chucks burrow in rocky areas to a depth of 3 feet when active - when they hibernate animals can burrow down up to 20 feet
- Rock chucks are a threat to the integrity of canal banks and small dams since they enjoy making their habitat in riprap - rock or other material used to protect water structures against erosion



While FWL may initially have the authority to list the gopher under the Endangered Species Act, it must have substantial evidence to support its decision. The same is true for Thurston County's proposed Habitat Conservation Plan/EIS. Clearly, FWL does not have this evidence and therefore must not list the gopher. If the gopher is not endangered, Thurston County's HCP/EIS must acknowledge this. Otherwise, FWL and Thurston County's actions will not meet the requirements of the law and will be subject to reversal upon appeal.



3. If FWL lists the gopher, should agriculture and farming be exempted under the 4D Rule; should growers who produce food and fiber be protected from 'incidental take' requirements?

Absolutely! One of the most significant factors in maintaining healthy gopher populations is the existence of working lands and a healthy agricultural economy.

Gophers may destroy crops and damage farms, but farms are very good for the gophers. As described above, working farms preserve open space and provide both important habitat and food to the gophers. This also serves as a counter-balance to urban sprawl which may destroy habitat. (See Appendix A herein).

The thing that FWL must understand here is that 'working lands' require farmers to work them. If FWL and/or Thurston County create a regulatory environment which makes farming impractical, or if they create legal consequences which make farming too risky, then farmer will leave the land and farms will revert to wilderness. Wilderness is not habitat which is conducive to gopher populations.

It is therefore important for FWL and Thurston County to understand what agriculture is, does, and needs. They should also understand why working lands and local food production is important to our society.

- Agriculture is generally defined as " the production of food or fiber". It includes subsistence, commercial, and charitable farming. 'Subsistence farming' produces crops for consumption by the farmer whereas 'commercial agriculture' produces crops for sale or barter. 'Charitable agriculture' produces crops for those who are in need. All three have been part of agriculture for millennia and today are essential for a diversified agricultural economy and a healthy sustainable farming community.
- Farming may be defined as the agricultural use of land or water. Farms and ranches produce a wide variety of agricultural products including row crops, vine and tree fruit, nuts, livestock, fish and aqua-culture crops, timber products, cotton, and hemp.
- Farming is an activity. It includes pasturage, tillage, and a wide variety of other activities. It is not dependent on large tracts of land or, sometimes, any land at all. Indeed, small acreage farming is one of the fastest growing segments of 21st century agriculture and local farms have demonstrated that lot of food can be grown on a little land. (See Appendix B hereing– "Friendly Grove Farm and the Kiwanis Garden Project").

- Farming is based on relationships. The farmer must have a relationship with the land as a good steward of it. S/he must also have relationships with his/her family, farm workers, neighbors, suppliers, transporters, and customers. Without these relationships, farming will not succeed.
- A farming community and an agricultural economy is a complex and fragile system. All of the necessary components must be present and functioning for farming to succeed. Government regulations cannot create a farming community but they sure can kill one.
- Farming generally requires a large investment of time, money and effort, but it produces little financial return to the farmer. This is especially true in Thurston County where farms are smaller than in Eastern Washington and many farmers must maintain second and third jobs so that they can afford to farm. Many farmers cannot afford health care or a retirement plan, and struggle to find money to educate their children. Generally, their primary and perhaps only asset is the land which they farm.
- Farmers can farm without necessarily owning farmland. Beekeepers, for example, can maintain livestock (bees), produce at least two agricultural crops (honey and beeswax) and help other farmers pollenate their crops without needing to own a farm.
- Farming is a 24 hours per day, 12 month per year activity. Successful farming is subject to the uncertainties of weather, soil conditions, and other factors that operate on their own schedule. Generally, crops grow in the summer and are harvested in the fall. In winter and spring, farmers prepare their fields for the next growing season. In between times, farmers must keep records, fix machinery, buy supplies, maintain their access to markets, and figure out how to spread intermittent cash flow across a 12 month period.
- Farming needs infrastructure. This includes fencing, water and irrigation systems, wells, barns and sheds, and farm houses. It also needs roads and transportation facilities, farmers markets and other venues to sell produce, and processing facilities to turn the produce into value-added products.
- Fencing is essential in Thurston County because of the deer. Local deer populations are out of control in many parts of the County and deer have also become pests. A couple of deer can destroy a field of crops, a blueberry or raspberry patch, or an orchard in short order with their browsing. Therefore, local farmers must fence their farms in order to produce crops and they must maintain their fences throughout the year.
- Thurston County has a significant agricultural sector which provides fresh food grown locally to our community and a substantial contribution to the economy. Local farmers sell their produce at farmers markets, through Community Supported Farms (CSA's), through the Olympia Coop and other stores, and to local restaurants, school, hospitals and other institutions. According to the Washington State Department of Agriculture, in 2011, Thurston County had 1288 farms which produced \$118 million in economic activity. (<http://agr.wa.gov/AgInWa/docs/126-CropProductionMap12-12.pdf>).

Given the foregoing, FWL and Thurston County must exempt farming and agricultural activities (including pasturage and tillage) from the restrictions which they may impose in order to keep 'working lands' working, to maintain open space, and to preserve the habitat which supports local gopher populations. FWL must create these exemptions under its 4D rule and make it clear the farming and agriculture will not be hindered by its 'incidental take' restrictions. Similarly, Thurston County's EIS must acknowledge that agriculture and working lands create desirable habitat for gopher populations. The

County's Habitat Conservation Plan and its other regulations must then be written (and in the case of the Critical Area Ordinance and Agritourism Ordinance be rewritten) in a manner that supports agriculture, promotes farming, and helps local farmers.

These things must be clearly acknowledged and then both FWL and Thurston County must follow through when they create their rules, plans, and programs.

4. Has FWL met its legal requirement to consult with other stakeholders in the ESA listing process?

No, FWL has not done so.

First of all, FWL proposed 'boiler plate' rules which it apparently copied from a prior listing project in another part of the country, perhaps somewhere in the South. A number of terms in the proposed language do not make sense here in the Pacific Northwest.

For its initial rules draft, FWL should have consulted organizations which worked with farmers and understood local agriculture like the Thurston Conservation District or WSU Extension but did not do so.

For that matter, FWL should have contacted an 8th grade science teacher for help with its proposed rules. If it had, it would have known that growing and harvesting crops does not take place between "November 1 and March 28". Apparent the scientists on FWL staff do not understand that crops grow in the summer and are harvested in the fall. But then again, these are likely the same learned scientists who determined that since our gopher population is widespread and abundant, and cannot be killed despite years of effort by the Federal Government, then it therefore must be 'threatened' with extinction.

Secondly, FWL has not adequately consulted with the dozens of local governments and junior taxing district, private businesses and local organizations which will be affected by the gopher's listing. FWL clearly does not understand or appreciate what these entities do or how the gopher's listing will dramatically affect their operation.

Thirdly, FWL had not adequately consulted with state and other federal agencies in Thurston County. As an example, USDS National Resource Conservation Service has invested ten of millions of federal dollars in Thurston County to help farmers and support local agriculture. If ill-informed rules promulgated by FWL or by Thurston County damages/destroys local farming, it will waste this substantial investment of Federal funds and serve to negate the Federal Government's policy of supporting agriculture.

5. Is FWL's focus on species a mistake and does it miss the real concern here—which is preservation of prairie habitat in Thurston County?

Yes, It would seem so, according to Thurston County Planning Staff.

On April 6, staff from FWL and Thurston County made a public presentation at the Olympia Fairgrounds and discussed Thurston County's Draft EIS for the Prairie Habitat Conservation Plan. Thurston County Director of Planning Scott Clark showed photos of maps from the 1940's and current aerial photos, both of Thurston County's prairie lands. Mr. Clark noted that the conservation effort which has now grown into the proposed ESA listing of the Manzama pocket gopher, Streaked Horn Lark and the Taylor

Checkerspot butterfly, began with the County's concern about the loss of prairie habitat due to urban development.

Mr. Clark spoke at some length and explained that since prairies were flat and readily developable, they have attracted housing and high density development. Mr. Clark's point was that the County's concern was preservation of open space and habitat for all of the animal populations in Thurston County. The species-specific focus came later, when FWL proposed listing the gopher, butterfly, and lark.

Indeed, this situation would be easier to manage and yield better results for our community if we refocused our public discussion on creating a balance between future development, maintaining our open space, and supporting our agriculture and farming community. The current discussion, aimed at preserving pest animals who are not in fact threatened, creating uncertainty for our schools and other institutions, and enacting rules which will run farmers off the land serves no one's interest

These comments are respectfully submitted. Thank you for your consideration of them.

Sincerely,

A handwritten signature in black ink that reads "James Goche". The signature is written in a cursive, flowing style.

James Goche

For Friendly Grove Farm / Market Gardens Northwest LLC



Supporting local farms also helps endangered species

Published April 26, 2013

Public feedback at the April 18 hearing conducted by the U.S. Fish & Wildlife about its proposed listing of the pocket gopher and several other species, and about Thurston County's proposed habitat conservation plan, sent a consistent message to federal regulators and our County Commissioners.

The message was:

- successful preservation relies on retaining our working lands because they preserve open space, create habitat, and reduce urban sprawl; and,
- the rules being proposed by USFWS and the county are taking us in the opposite direction.

Those testifying emphasized that if we are serious about keeping our working lands working, we have to also support those who do the work. This means encouraging farmers to continue farming by reforming the regulation and taxation of agriculture so that they can realize a reasonable return on their investment of time and money.

The public's message was that the county's spiraling regulations, increasing fees, and vague permit requirements are damaging our local agricultural economy and destroying local farms. Add to this, the new restrictions on agriculture, such as limited farming activity to only the winter months (Nov. 1-March 28), which USFWS is proposing and the result will be a nonworking rural landscape, degraded property values, and diminished tax base.

This is simply not the way to go.

Working farms provide a diverse and healthy habitat for the species proposed for listing as well as the rest of our South Sound fauna. Farmers are good stewards of the land and have shown that they are willing to work in partnership with conservationists to maintain both the productivity and environmental quality of our working lands.

Some public agencies are successfully supporting these efforts, notably USDA/NRCS, the Thurston Conservation District, WSU Extension and the Port of Olympia.

Therefore, a better approach is for USFWS to acknowledge that agriculture supports preservation of the species that it proposes to list and exempt it from federal restrictions.

At the same time, Thurston County must reform its local regulations and its interpretation of state law so that it supports local farmers and keeps working lands working.

Otherwise, these public agencies will be destroying the habitat of the very species that they are trying to protect, as well as the local farms that provide wholesome food for our families.

James Goche is a local farmer. He and his family operate Friendly Grove Farm north of Olympia.

Attachment to James Goche's comment

Growing a lot of food for the community without using a lot of land

There is presently some confusion among policy-makers about what a “farm” is and whether it must have a large piece of land associated with it in order to be “agricultural”. Some officials still seem to adhere to the 19th century notion of a farm being “40 acres” while others rely on the “five to ten acre” standard incorporated into some of the 20th century land use laws. The answers to these questions are important because they will determine how land is regulated and taxed. This in turn can either help or hurt farmers who are growing crops and running an agricultural business while trying to raise their family and keep their bills paid.



In fact, agricultural data over the past decade shows that these older standards are out of date. It supports policy-makers who are now adopting a 21st century definition which acknowledges that farms of only an acre or less can generate significant agricultural production. There are a growing number of examples

which show this and one of them is a three year old agricultural project at a Thurston County farm which is growing a lot of food on a small piece of land.

The enterprise uses only a fraction of an acre to produce enough food to feed several thousand people. It also attracts a large number of volunteers and visitors to the area which promotes agritourism and educates the public about the importance of local farming. Finally, it is helping local institutions feed the hungry and support low-income families during difficult economic times. With small acreage farming representing one of the fastest growing segments in agriculture, this project



illustrates that a farm should no longer be defined by acreage or limited to large parcels. It shows that small

farming operations on less than an acre or less can improve the quality of life in the surrounding community and make a significant contribution to the local economy.



The project started in 2010 when Friendly Grove Farm contacted the Olympia Kiwanis Club to discuss a partnership aimed at growing food for the Thurston County Food Bank. The owners wanted to help the community and address a decline in Food Bank contributions at a time when many people were losing their homes and jobs and going hungry. Kiwanis was already growing food

for people in need at several large gardens spots in the area and was interested in expanding its operations. The farm and the club negotiated a cooperative agreement and a partnership was born.



The farm, itself only four and a half acres, provided 4/10's of an acre to Kiwanis for a growing area. It also raised a fence around it to keep the deer out of the crops and ran a water line to the field. Access was available via 30th Court NE (a historic county road opened as “Bigelow Road” and used to support farming in the area since 1886) and the farm provided off-road parking for visitors.



Attachment to James Goche's comment

Kiwanis then assembled teams of volunteers from all over the area to till the field and begin planting crops. As the photos show, the weather did not always cooperate but the hearty Kiwanis volunteers persevered and succeeded in producing a good first crop.



Both Kiwanis and Friendly Grove Farm make it a practice to grow crops using organic methods while maintaining good stewardship of the land. As the Kiwanis volunteer program brought a wide variety of people to the farm, a broad cross-section of the public had an opportunity to learn about good agricultural and environmental practices through hands-on experience. And with the help of these volunteers, the first year (2010) brought in a harvest of nearly three tons of fresh vegetables to assist the



Food Bank in providing for people in need.

Encouraged by this success, the farm and Kiwanis extended their partnership for a second year and by the end of 2011, they had produced half again as much, growing over 9,000 lbs. of carrots, beets, rutabagas, squash, turnips, and garlic. According to the Food Bank, the second harvest was sufficient to support 900 families and help feed 2,700 people!



Another way to understand this harvest is to consider the retail price of the totals listed on the following pages. If these vegetables were purchased at a local super-market, their cost would be over \$21,000. Not a bad return for crops grown on only 4/10 of an



acre!

This project is now beginning its third year and hopes to produce even more food in 2012. It serves as a great example of what can be accomplished when members of the community work together towards a common purpose.



It also shows that farming operations on less than an acre can produce a lot of fresh food and feed a lot of people



Attachment to James Goche's comment



Thurston County Food Bank
220 Thurston Ave. NE, Olympia, WA 98501
(360) 352-8597 Fax: (360) 352-7732

February 27, 2012

James Goché
Managing Partner
Market Gardens Northwest LLC
[REDACTED]
Olympia, Washington 98501

Dear Jim,

I am writing to thank you and your family for your continuing support of the Thurston County Food Bank.

I understand that in 2005, you created Market Gardens Northwest LLC to buy Friendly Grove Farm just north of Olympia. Since then, you have kept the land in agriculture and reorganized the farm as a small acreage agri-business. The farm now grows crops using organic methods and bases its operation of a conservation plan in order to maintain good stewardship of the land.

Several years ago, Market Gardens teamed up with Kiwanis, and together they began growing food for TCFB. You fenced in 0.4 acres at the farm for this purpose, and in 2010, the partnership provided us with approximately 6,000 lbs of fresh vegetables. Last year (2011), you increased that amount by half again as much and gave TCFB over 9,000 lbs of fresh carrots, beets, rutabagas, squash, cucumbers, and garlic.

To give you some idea of what this means, 5 lbs of fresh vegetables is what we provide to a household of 1-2 people. Therefore, the four and half tons of vegetables that Market Gardens/Kiwanis gave us last year will support 900 families and help feed 2,700 people. A contribution of this size makes a big difference in helping TCFB fulfill its mission to serve the community and help feed people in need. It is very welcome and much needed given our increasing demand and difficult economic times.

I might add that producing 4 1/2 tons of vegetables on less than a half acre shows that small growing operations are an important part of our local agricultural economy and can produce a great deal of food for the people of Thurston County.

We are happy to hear that Market Gardens/Friendly Grove Farm and Kiwanis will continue their partnership this year and that you hope to again increase on last year's contribution. TCFB appreciates your continuing support.

Sincerely,

Robert Coit, Executive Director

Attachment to James Goche's comment

February 12, 2012

Jim Goche
Market Gardens Northwest (MGNW)
[REDACTED]
Olympia, WA 98501

Subject: Report on the 2011 Harvest at MGNW

Enclosed is a detailed record of vegetables raised and harvested at 3020 Friendly Grove Rd NW, Olympia WA. The Olympia Kiwanis Club and Foundation farmed the fenced area in the NE corner of your property as one of our Food Bank Gardens. As 2011 was our second season on the property there were fewer difficulties and increased ability to raise crops.

The principal crops for 2011 were beets, carrots, rutabagas, and winter squash with some cucumbers. A small quantity of parsnips was harvested in early spring, held over from the 2010 growing season.

We harvested over 4,000 pounds of carrots, over 2,000 pounds of winter squash, 1,200 pounds of beets and over 1,400 pounds of rutabagas. In total 9,041 pounds of vegetables were raised and delivered to the Thurston County Food Bank.

In 2011, the irrigation timers were improved and were more effective in delivering water to the drip irrigation system.

In the 2012 season, we will have a similar mix of crops and again will rotate crops to minimize in-soil pest carry-over. We have applied manure and lime to increase/maintain soil fertility. We hope to improve vegetable washing processes in the area near the west garden gate. We will work with you on details of location.

We thank you for your donation of land, water and fencing and accommodating the periodic presence of fairly large numbers of volunteers who make the crops a reality.

Sincerely,


Don Leaf and Derek Valley
Co chairs of Kiwanis Gardens projects

Attachment to James Goche's comment

Kiwanis Gardens Harvest 2011																			
MGNW Vegetables in Pounds, 2011 Season																			
Date	Loc*	Bean	Beet	Cab	Cuc/Sq	Carrot	Garlic	Greens	Broc	Onion	Pars	Peas	Potato	Rad	Tom	W Sq	Total/Mo	Cum Total	
Mar																			
24	G											59						59	
tot	to J																		59
G= MGNW/Goche																			
Date	Loc*	Bean	Beet	Cab	Cuc/Sq	Carrot	Garlic	Greens	Broc	Onion	Pars	Peas	Potato	Rad	Tom	W Sq	Total/Mo	Cum Total	
July																			
Total M/J/J		0	0	0	0	0	0	0	0	0	59	0	0	0	0	0	59		
Vegetables in Pounds																			
Date	Loc*	Bean	Beet	Cab	Cuc/Sq	Carrot	Leeks	Greens	Broc	Onion	Pars	Peas	Potato	Rad	Tom	W Sq	Total/Mo	Cum Total	
Aug																			
11	G		50			57												107	
31	G		589															589	
Total Aug		0	639	0	0	57	0	0	0	0	0	0	0	0	0	0	696		755
Vegetables in Pounds																			
Date	Loc*	Bean	Beet	Cab	Cuc/Sq	Carrot	Leeks	Greens	Broc	Onion	Pars	Peas	Potato	Rad	Tom	W Sq	Total/Mo	Cum Total	
Sept																			
7	G				47	193												240	
10	G					152												152	
12	G					340												340	
24	G		83		101	735												919	
Total Sep		0	83	0	148	1420	0	0	0	0	0	0	0	0	0	0	1,651		2,405

1

2/13/2012

Kiwanis Gardens Harvest 2011																			
Vegetables in Pounds																			
Date	Loc*	Bean	Beet	Cab	Cuc/Sq	Carrot	Leeks	Greens	Misc	Onion	Pars	Peas	Potato	Rad	Tom	W Sq	Total/Mo	Cum Total	
Oct																			
4	G								50								116	166	
13	G																109	109	
22	G					210			739								1,857	2,806	
26	G					130												130	
29	G					756												756	
Total Oct		0	0	0	0	1,096	0	0	789	0	0	0	0	0	0	0	2,062	3,967	6,373
Vegetables in Pounds																			
Date	Loc*	Bean	Beet	Cab	Cuc/Sq	Carrot	Leeks	Greens	Misc	Onion	Pars	Peas	Potato	Rad	Tom	W Sq	Total/Mo	Cum Total	
Nov																			
3	G					750												750	
8	G					743			675									1,418	
Dec																			
1	G		500															500	
Tot Nov/Dec		0	500	0	0	1,493	0	0	675	0	0	0	0	0	0	0	2,668		9,041
Total to Date		0	1,222	0	148	4,066	0	0	1,464	0	59	0	0	0	0	0	2,082	9,041	

2

2/13/2012

Attachment to James Goche's comment

KIWANIS VOLUNTEERS

The following is a list of individuals and organizations who volunteered their time to help with the Kiwanis Food Bank Garden Project at its several sites in Thurston County, one of which is Friendly Grove Farm. This information comes from the Olympia Kiwanis Foundation Report, dated January 2, 2012.

Kiwanis Club of Olympia members	Department of Ecology Sustainability Committee's
Olympia High School Kiwanis Key Club	Food Bank Garden and Johanna Offner
Thurston County Food Bank	Saint Mark's Lutheran Church's
Thurston County Commissioners	Christian Center students
Gleaners Project	Food Bank Garden and Gayle Frare
School Garden Projects	Thunder Mountain Farm, Dave Goff
Vista Village Retirement Condominiums	Washington Conservation Corp crews
Northwest Market Gardens, Jim Goche	THEM hiking group
Capital High School Kiwanis Key Club	City of Lacey Community Market
Black Hills High School students	United Way Day of Caring
North Thurston Kiwanis, Lacey	Intercity Transit staff
North Thurston High School Key Club	Saint Martin's University students
Timberline High School Key Club	Common Ground Farm, Julie Puich
Saint Martin's University Circle K Club	Garden Raised urban Bounty
The Evergreen State College	GRuB students
Madison Elementary School	Professor Karen Gaul's students
Office of Financial Management and Policy	Sunbreak Baptist Church
Olympia City Council members	Nova School Winterim program
Pioneer Elementary School	Department of Transportation
Lincoln Elementary School	Department of Social and Health Services
Department of Licensing	Department of Natural Resources
Office of the Governor	Department of Employment Security
Department of Enterprise Services	

And many other volunteers from throughout the cities and Thurston County

Terry Kirkpatrick, President 2010-2011 Russ Carstensen, President 2011-2012

Don Leaf and Derek Valley, Co-chair, Kiwanis Food Bank Gardens

Attachment to James Goche's comment

[REDACTED]
Olympia, Washington 98501
360 [REDACTED] [REDACTED]@comcast.net

May 19, 2013

Tim Romanski
US Fish & Wildlife Service
US Fish & Wildlife Office
Suite 102
510 Desmond Drive SE,
Lacey, Washington 98503-1263
(Email: WFWOComments@fws.gov)

Re: Thurston County HCP-EIS

Greetings,

This is a second letter providing public input for the Thurston County Habitat Conservation Plan and EIS. As noted prior, I am a long-time resident of Thurston County, my family has a small farm north of Olympia and I also serve on the board of the Thurston County Farm Bureau. These things provide a basis for the following comments:

This letter raises questions about the destructive nature of the Manzama pocket gopher and the novel situation which Thurston County and US Fish and Wildlife (FWL) have created by proposing Endangered Species Act (ESA) protection for a “pest” species which state and local programs have been attempting to eradicate, both here in Washington State and around the country, for many years.

FWL’s proposal to list the pocket gopher and increase its population is effectively a proposal to increase the damage done by the species. Therefore, FWL’s proposed ESA listing conflicts with long established public policy of reducing or eliminating gopher populations in order to protect farming, preserve our ‘working lands’ and safeguard our agricultural crops. This public policy also seeks to protect the public health by reducing/eliminating gopher damage to utilities and public works, such as dams and dikes.

This letter raises concerns about the extraordinary environmental and economic consequences of government guidelines for “living with gophers”. The proposals by the Washington State Fish and Wildlife Department (WSFWL) for “avoiding conflicts” with the pocket gophers is a case in point. These includes installing subterranean fencing and armoring utilities with gravel, which would require wholesale excavation of farmland, disruption of the soil, and destruction of habitat for other species as well as the gopher itself. These guidelines encourage actions that are harmful to the environment and would bankrupt farmers who attempted to follow them.

The issues raised herein are relevant to both to FWL’s listing of the Manzama pocket gopher and to Thurston County development of an EIS and Habitat Conservation Plan to protect that species.



Attachment to James Goche's comment



Attachment to James Goche's comment



Attachment to James Goche's comment



Attachment to James Goche's comment

RCW 17.12.010 Pest districts authorized. *For the purpose of destroying or exterminating squirrels, prairie dogs, gophers, moles or other rodents, or of rabbits or any predatory animals that destroy or interfere with the crops, fruit trees, shrubs, valuable plants, fodder, seeds or other agricultural plants or products, thing or pest injurious to any agricultural plant or product, or to prevent the introduction, propagation, growth or increase in number of any of the above described animals, or rodents, the board of county commissioners of any county may create a pest district or pest districts within such county and may enlarge any district containing a lesser territory than the whole county, or reduce any district already created, or combine or consolidate districts or divide, or create new districts from time to time in the manner hereinafter set forth.* (Emphasis added)

2C. Expanding Gopher Populations Works Against the Goals of Saving Farmland and Preserving Prairie Habitat.

Pest prevention laws in Washington State and around the country which designate pocket gophers as destructive pest are supported by scholarly studies conducted by major universities, usually working in partnership with state and federal agencies. Several of these are discussed below and listed in the attached appendices.

One study, ***“Subterranean Rodents as Pests: The Case of the Pocket Gopher”*** (Appendix 1A), created by the University of Nebraska and the United States Department of Agriculture National Wildlife Research Center provides an excellent summary of the damage done by pocket gophers and the various methods used to control (kill) the animal. This study also contains a comprehensive list of references citing other studies and resources about the pocket gopher and its status as a “pest”. This information should be especially helpful to both FWL and Thurston County in analyzing the environmental impact of the pocket gopher.

Another study, **The Vertebrate Pest Management Study Guide**, published by the Utah Department of Department of Agriculture and Food, states that “Pocket gophers reduce the productivity of those portions of alfalfa fields and native grasslands on which they are found by 20 to 50 percent.”

Still another study, published by the State of California **“Knowledge Expectations for Pest Control Advisors: Vertebrate Pest Management”**, lists pocket gophers as a “major mammal pest” and summarizes the damage it does and the methods used to control it.



The Utah study is especially significant because it adds an additional element to the gopher’s status as a pest species. It highlights the fact that gophers destroy not only farm fields but also native grasslands that make up prairie habitat here in Thurston County. This then puts FWL and Thurston County in something of a bind.

Both agencies have said that preservation of prairie habitat is a top priority, especially for Thurston Count. County Planning Director Scott Clark and other county staff have discussed at some length the County’s interest in saving its remaining prairie land. But assuming that FWL follows through on its proposal to protect the gopher, the Utah State study indicates that expanding gopher populations will damage the prairies and destroy the grass which grazing animals feed upon. Without grazing or human intervention (which would probably be prohibited by the ESA listing), the prairies will overgrow with

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woody shrubs and eventually trees. Therefore if FWL achieves its goal of expanding gopher populations, it will be working against the goals of preserving our remaining prairie lands.

2D. Gophers Have Little Positive Effect on the Environment. A lot has been said so far to characterize the pocket gophers as a destructive pest, but in all fairness, doesn't the gopher make some positive contributions to the environment which helps offset the damage that it does.

Well....not really.

2D1. Washington State Fish & Wildlife Department Tries (and Fails) To Put A Positive Spin on Pocket Gophers.

Looking first to local resources, we find that the Washington State Fish and Wildlife Department's website (appendix 2 below) stands out among State agency websites across the county for its attempt to acknowledge the pocket gopher as a pest and then bow to conservation interests by suggesting impractical ways to avoid or kill them. What the WSWFL website does do extremely well however is to demonstrate that there is no practical way for farmers or other rural landowner to live with large and growing gopher populations and no meaningful way to avoid the damage that that do. To wit:



WSFWL portrays pocket gophers are aggressive dirt movers and says that the food and scat left in their tunnels may have some beneficial effect on soil fertility. It doesn't however mention that much of this material comes from the crops that farmers were attempting to grow or native grasslands that Thurston County is trying to preserve.

The WSWFL website then struggles to be politically correct about controlling gopher populations. It admits that killing gophers is not illegal (except with certain types of traps forbidden by state law for all vertebrate species) but recommends that the public adopt a gopher control strategy of "Avoiding Conflicts"! This is not easy to do given the gopher's aggressive and invasive nature.

For this, the agency suggests that farmers build underground fences and line their fields with steel mesh buried at a depth of 24 inches to protect their crops—a challenging and expensive proposition for, say, a 40 acre farm. This would require the farmer to excavate an enormous amount of topsoil and cause colossal environmental damage, destroying soil fertility, uprooting plants, and removing critical habitat for other species. The cost of the excavation and of 40 acres of steel mesh would be enormous!

For waterlines and the other buried utilities that gophers destroy, WSWFL suggests surrounding them with 6-8 inches of course gravel 1 inch in diameter. For new utilities, this would add substantially to the installation costs and for existing utilities, it would be totally impractical. Even if a farmer could find all of the underground pipes and wires on the farm, it is impossible to dig them up and armor them with gravel

In addition to installing these gopher barriers, WSWFL recommends "scaring the gophers away" rather than killing them. Unfortunately, it then observes that "gophers do not frighten easily" and suggests that the public "be skeptical of commercial products and claims" for doing so.

If landowners do kill gophers, WSWFL suggests doing so only in natural ways. It recommends flooding them out of their burrows but then admits that gophers can withstand most deluges.

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It also suggests that property owners encourage predator species, such as coyotes, weasels, skunks, dogs, and owls, to visit their land to eat the gophers. The agency however admits that these predators may not eliminate many gophers because they are difficult to catch and the predators tend to lose interest and quickly move on to whatever is “more profitable”. Here WSWFL seems to be unaware that these predators also eat chickens and ducks and other livestock which farmers raise, as well as household pets.

Finally, WSWFL acknowledges that gophers “may be trapped or killed” but traps must be “live traps”. Since it is also illegal to release pocket gophers anywhere in the state “except on the property where it was legally trapped”, a farmer who traps a live gopher must either kill it after catching it or let it go again on his property.

At the end of the website, WSWFL says that the Mazama pocket gopher is common through Western Washington but that populations have been shrinking in Thurston, Pierce, Mason, and Clallam Counties and admonishes that “people should not use lethal control” because this gopher in these places is “state threatened and a federal candidate species”

These statements however are contradictory and serve to undercut FWL’s proposed ESA listing of the pocket gopher. If gopher populations are widespread throughout Western Washington, the species is not “threatened” under provisions of the ESA. If it damages farmland and crops, the gopher is a legally designated pest species. If it harms native grasslands, it is detrimental to prairie habitat preservation. If it is difficult to live with and impossible to avoid or deter, lethal control is the only reasonable alternative.

2D2. Pocket Gophers as ‘earthmovers’.

WSFWL lists earthmoving as a “benefit of the pocket gopher” and goes to some length on its website to list the dubious environmental contributions made by the animal’s tunneling. It says, in part, that:

A typical pocket gopher can move approximately a ton of soil to the surface each year. This enormous achievement reflects the gopher’s important ecological function.

The agency mentions soil aeration as a chief benefit of tunneling but neglects to include the fact that livestock can break a leg stepping in a gopher hole and in the case of horses, can also throw their riders and fall on them.

But let’s take a moment to consider the environmental effect of large scale dirt moving on farmland. WSWFL says that pocket gophers can move a ton of dirt per year and 20 gophers can inhabit an acre of ground. This is a low estimate considering that the University of California’s Agriculture & Natural Resources Department/Statewide Integrated Pest Management Program (Appendix 3 below) indicates that it has found up to 60 gophers per acre in irrigated alfalfa fields.

So taking an average of the two, let’s assume that there are 40 gophers per acre on a 40 acre farm moving one ton of dirt per year. We will ignore the gnawed pieces of waterline and utility cable that they might also have transported.



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This means that in one year, the farmer will see 1,600 tons of soil on his/her farm moved and put in places he probably doesn't want it. Moving this much soil can destroy cropland and pastureland and can dramatically alter the habitat of other species.

A cubic yard of topsoil weighs between 1,700 and 2,300 lbs (depending upon moisture content. (http://answers.reference.com/information/misc/how_much_does_a_yard_of_topsoil_weigh). So if we take an average weight of one ton per cubic yard, 1,600 tons of soil would be piled up in one place 300 feet long, 48 feet wide and 3 feet high.

And to put this into perspective using Thurston County standards, its County Code requires a landowner to get a permit if s/he grades, fills, or excavates only 50 yards of dirt. The landowner must go through a full blown SEPA review at 500 yards. Therefore, the excavation of 1,600 yards of dirt would require 32 permits and three SEPA reviews.

2D3. Pocket Gophers Tunneling Allows Other Pests To Attack Crops. Another downside to gopher tunnels is that they allow other predator species, notably voles and other rodents, to access crops (appendix 4 below). Indeed, I have observed first hand damage done to root crop in Thurston County by voles using mole holes to reach the vegetables.

Sources say that voles can be just as destruct as gophers. Therefore, gopher tunnels are a "force multiplier" for damage to farmland and crops by providing access for multiple predator species.

2E. Gopher Damage Is Not Offset By Their Personalities. By now, it should be clear that pocket gophers cause a great deal of destruction, but aren't they redeemable as cute cuddly little creatures.

Again, not really.

According to the information in the appendices below, universities and agencies that have studied the pocket gopher have found them to be nasty, aggressive, anti-social creatures that are highly territorial. They are solitary animals that don't associate with each other except to mate. They don't hibernate and so can be active year round.



They are known to be carriers for rabies and monkey pox and can be infested with fleas, ticks and lice. They will attack if picked up or cornered and their bite can exert 1,600 lbs of force with razor sharp incisors.

I don't recall seeing a pocket gopher stuffed animal in a toy store before but given its personality, perhaps this is not surprising.

In summary, the Manzama pocket gopher is not threatened and does not meet the criteria for listing under the ESA. FWL has offered no persuasive evidence to support its proposed listing. A reduction in part of the gopher population in one or several counties is not sufficient when the population is wide-spread throughout Western Washington.

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In addition, protection of a pest species runs counter to Federal and state public policy and serves to negate long-standing eradication projects, some of which have been funded with public dollars. Public policy requires that pests be controlled or eliminated, not protected and increased. Reduction of pocket gopher populations meets this public policy goal.

The pocket gopher is a destructive animal which harms agriculture, farmland, and crop production.

According to the Washington Department of Agriculture (using 2007 Agricultural Census numbers updated in 2011), Thurston County had 1288 farms which produced \$118 million in economic activity.

(<http://agr.wa.gov/AgInWa/docs/126-CropProductionMap12-12.pdf>).

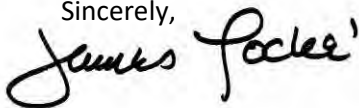
It also harms native grasslands and threatens prairie habitat. It gnawing destroys plumbing, electrical wiring, and communication cables. Its burrowing destroys habitat of other species, weakens dams and dikes, and threatens the health and safety of the public.



Thurston County, in drafting an EIS and habitat conservation plan will have to do more than merely develop a plan to protect the pocket gopher. It must also quantify the effect which the gopher has on the environment and other species. It must also consider its impact of agriculture, working lands, and crops. Then it must develop a plan which serves the public interest and protect the public.

These comments are respectfully submitted. Thank you for your consideration of them.

Sincerely,

A handwritten signature in black ink that reads "James Goche".

James Goche'

For Friendly Grove Farm / Market Gardens Northwest LLC

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are relatively small, secretive, prolific, and all have continuously growing incisors. Many rodent species have ecological, scientific, cultural, and/or economic importance.

A variety of economic and health problems result from rodent interactions with humans. These include damage to growing crops, trees, seeds, pastures; damage and contamination of stored foods; damage to structures and property; and disease transmission (Witmer et al. 1995a). Singleton et al. (2003) estimated that in Asia alone, the amount of grain eaten by rodents would provide enough food to feed 200 million Asians for a year.

Notably, few (perhaps 5%) rodent species around the world are serious pests. Examples of genera and species of rodents considered to be serious pests around the world were provided by Prakash (1988) and Witmer et al. (1995a). Hence, when a damage situation occurs, it is very important to determine the species causing the damage, the extent of the damage, and the abiotic-biotic-cultural factors involved before rodent population and damage management strategies are implemented (Singleton et al. 1999).

We use the North American subterranean rodents, pocket gophers, to illustrate the nature of rodent pests, the types and extent of damages, and the management measures used to reduce populations and damage.

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Subterranean Rodents: News from Underground

S. Begall, H. Burda, C.E. Schleich (Eds.)

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21.2 Pocket Gophers (Family Geomyidae)

Pocket gophers are endemic to North America from central Canada to Panama. There are seven genera: *Cratogeomys* (sometimes considered a subgenus of *Pappogeomys*), *Geomys*, *Heterogeomys*, *Orthogeomys*, *Pappogeomys*, *Thomomys*, and *Zygogeomys* (Nowak 1999; Baker RJ et al. 2003).

There are at least 35 species and about 300 subspecies within this family of

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rodents.

In general, pocket gophers have thick-set bodies with short necks and a head-body-length of 15–30 cm. They are subterranean to a high degree, living in closed burrow systems. Pocket gophers have small eyes and pinnae, a good sense of touch, and stout forelegs with strong claws. They rarely venture to the surface except to push soil out, to occasionally clip and gather above ground vegetation, and for dispersal purposes. Except for mating and rearing young, most species live solitary lives within their burrow system. Pocket gophers possess amazing digging and gnawing abilities, and have been extensively studied. Details of their biology, ecology, and environmental effects have been reviewed by Nevo (1999), Nowak (1999), Baker RJ et al. (2003), and Reichman (this volume).

21.3 Damage by Pocket Gophers

Pocket gophers commonly come into conflict with humans. This occurs through crop damage, rangeland damage, forest damage, and physical damage to structures and property (Marsh 1988). It may be a tribute to their ability to cause damage that Marsh (1988), in his chapter on rodent problems on the North American continent, discussed pocket gophers first amongst 21 rodent groups! He lists the damage by pocket gophers in North America as widespread and, on a site specific basis, as generally in the light-to-heavy damage categories. We review the types and extents of damage caused by pocket gophers. Unfortunately, much of the literature is dated and there is insufficient quantification of the damage.

21.3.1 Forest Damage

Pocket gophers are one of the most serious threats to reforestation in North America (Engeman and Witmer 2000). They kill young trees by debarking stems (sometimes called girdling) at the ground surface, pruning roots below ground, clipping seedlings aboveground, and pulling entire seedlings below ground. Damage higher up the boles of trees can occur with snow cover (pocket gophers are active year round). Damage to roots occurs mostly during the winter and early spring when herbaceous plants

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are less available. A wide array of tree species can be affected. Graham and Kingery (1990) reported that *Thomomys* gophers killed 71% of the pine trees on plantations by year 6 after planting. Pocket gophers readily invade clearcut units, especially once herbaceous ground cover becomes abundant. When foresters replant the unit with seedlings, pocket gopher foraging can remove all or large portions of the seedlings. This requires replanting, often preceded by pocket gopher population control. This process greatly escalates total costs, often prompting foresters to routinely practice pocket gopher control prior to reforestation. Engeman and Witmer (2000) assessed the risk posed by *Thomomys* gophers and provided guidelines for how to avoid serious damage and when to apply pro-active measures. However, pocket gopher populations recover very quickly after control, by reproduction of survivors and by re-invasion from surrounding areas (Engeman and Campbell 1999). Hence, some researchers have recommended that forest management practices be modified to provide less suitable habitat for pocket gophers (Smallwood 1999; Engeman and Witmer 2000).

21.3.2 Rangeland Damage

The substantial impacts that *Geomys* gophers can have to rangelands was reviewed by Foster and Stubbendieck (1980). They documented 18–49% reduction in range plant production on sites occupied by pocket gophers in Nebraska. This included an increase in some species of perennial grasses, but a decrease in coverage of annual forbs and annual grasses. Because of the soil mounding activities of pocket gophers, there was also an increase of 5–25% in bare soil coverage. They also cited studies reporting on range production changes: one reported an herbage reduction of 284 kg/ha in California where *Thomomys* gophers occurred and another reported an herbage increase of 218 kg/ha after *Geomys* gopher control in Colorado. Fitch and Bentley (1949) reported a 25% forage reduction by *Thomomys* gophers in California. In Alberta, Canada, Alsager (1977) reported an 18% decrease in forage production where *Thomomys* gophers were not controlled. He also noted a 16% increase in forage production within 60 days of pocket gopher control.

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21.3.3 Fruit Tree Damage

Documentation of *Thomomys* gopher damage to fruit trees has included apple, cherry, and pear trees in the Pacific Northwest (Sullivan et al. 1987; Sullivan and Hogue 1987) and citrus trees in California (Cummings and Marsh 1978). In Guatemala, *Orthogeomys* gophers damage banana trees (Caid 1959) as do *Orthogeomys* and *Pappogeomys* gophers in Mexico (Whisson and Villa Cornejo 1996). Similar to forestry damage, this type of damage mostly involves root gnawing and basal girdling, with young trees (≤ 10 years old) most susceptible. Sullivan et al. (1987) noted that the damage in apple orchards did not seem related to soil type, perhaps because the orchards were irrigated and fertilized, and about 30–40% of surveyed orchards had *Thomomys* gopher damage. Sullivan and Hogue (1987) reported that the incidence of rodent damage (voles and *Thomomys* gophers) dropped from 40.6% to 9.6% once the rodents were controlled. They also achieved better rodent control by greatly reducing low ground vegetation with herbicides rather than using rodenticides.

21.3.4 Alfalfa and Field Crop Damage

Pocket gophers cause substantial damage to alfalfa crops in southern Canada and throughout the midwestern plains and western states of the USA. Case (1989) reported reductions in yield of 17–49% from *Geomys* gophers. They caused declines in yield in Nebraska of 30.2% in hay meadows and 16.7% in alfalfa fields (Hegarty 1984). The main declines were in some late successional perennial grasses and clovers. Losses were directly correlated with pocket gopher density and the percent of their mound cover. He also documented an increase in plant diversity because many annuals (including invasive and “weedy” plant species) germinated on the bare soil of the mounds. Similarly, Luce et al. (1981) documented alfalfa yield reductions of 40% in Nebraska. Jasch et al. (1992) estimated the economic losses in alfalfa production in Nebraska to be about \$10 million per year. They noted that fibrous-rooted varieties of alfalfa seem to better withstand pocket gopher damage. Proulx (2002) estimated losses to alfalfa fields in Alberta and Manitoba, Canada, by *Thomomys* gophers at \$15–30 million

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per year. He also compared the costs of various methods of pocket gopher control and noted an 18–28% increase in yield after control. Case and Timm (1984) created a computer model to calculate the dollar loss due to *Geomys* gopher activity so returns on control costs could be weighed

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against yield increases. In a survey of alfalfa producers in Nevada, Lewis and O'Brien (1990) identified *Thomomys* gophers as the main pest rodent, present on 87% of the farms. The main problems associated with the pocket gophers were, in declining order, 1) loss of yield, 2) equipment damage, 3) an increase in labor and fuel costs, and 4) a decrease in hay quality.

Pocket gopher control was practiced by 80% of the farmers, but 53% (the largest proportion of farmers) said it was only "somewhat effective".

Next to irrigation costs, they reported vertebrate pest management costs as their greatest expense; even higher than weed and insect management costs and fertilizer costs. Smallwood and Geng (1997) noted the relationship between damage level and *Thomomys* gopher density, but also explained that complex relationships exist: for example, the field may produce a higher yield a year after some gopher damage than it had averaged before gopher infestation, and more productive lands can sustain more damage.

Pocket gophers also damage other field crops. Villa Cornejo (2000) reported over 200,000 ha of sugarcane fields in Mexico had evidence of *Orthogeomys* gopher damage. She examined over 66,000 individual stalks and found about 21% had been damaged by pocket gophers. Whisson and Villa Cornejo (1996) examined over 1400 corn stalks in Mexico and found about 4% had *Orthogeomys* and/or *Pappogeomys* gopher damage. They mentioned other crops damaged, including wheat, potatoes, and cocoa, but gave no specifics.

21.3.5 Wire and Cable Damage

Connolly and Landstrom (1969) provided a good review of pocket gopher damage to buried cables. They considered the various species of *Geomyidae* to be the most significant source of animal damage to buried electrical and communication cables, noting smaller cable diameters sustained

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greater damage. Gophers were surmised to encounter and damage cables while seeking their main food source, roots. Most damage seems to occur in the rooting zone, 10–30 cm deep. They and other researchers (e.g. Hegdal and Harbour 1991; Ramey and McCann 1997) tested many types of cable coating, but in general, only a hard metal sheath or placement in a large-diameter (≥ 5.5 cm) conduit provided adequate protection from *Geomys* gophers. Isaac (1959) suggested that compacting soils in cable trenches would reduce *Geomys* gopher damage. He also recommended avoiding cable placement in areas of substantial pocket gopher activity. Cables are less likely to be damaged by gophers if they are placed more deeply underground because gopher burrows rarely exceed 292 G.W.Witmer, R. M. Engeman
2m in depth (Case and Jasch 1994). Small diameter underground irrigation pipes also sustain pocket gopher damage (Hegdal and Harbour 1991).

21.3.6 Hydraulic Structure Damage, Disturbance of Hazardous Waste and Archaeological Sites

Pocket gophers are truly efficient “digging machines”. Smallwood and Morrison (1999) reviewed studies reporting the excavation rate and burrow volumes of various species of pocket gophers. They found much variation which they attributed to the varying species, study locations, and methodologies used. In general, however, a single *Geomys* or *Thomomys* gopher can excavate 18m³ per ha per year and its burrow has a volume of at least 0.68m³. Hence, it is not surprising that earthen structures (dikes, canals, and levees) can sustain substantial damage from pocket gophers (Hegdal and Harbour 1991). This results in seepage, piping, and eventually, washouts (especially with water surges).

Several researchers have noted that *Thomomys* gophers can disrupt the integrity of waste burial sites and this is especially of concern when hazardous wastes are involved (Winsor and Whicker 1980; Hakonson et al. 1982; Sejkora 1989; Bowerman and Redente 1998; Smallwood et al. 1998). Hakonson et al. (1982) did not believe that much material was being brought to the surface, but a considerable “void space” was being created in the

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soil cover profile. Winsor and Whicker (1980) found that pocket gophers were bringing buried plutonium to the surface at a waste site in Colorado. The highest radioactivity counts were in the 0–10 cm soil layer and in the pocket gopher mounds. They noted that most burrowing activity was in the top 30 cm of the soil. On the other hand, Sejkora (1989) noted that pocket gopher burrowing activities reduced runoff, soil erosion, and chemical transport of surface materials.

Pocket gopher burrowing can disturb archaeological materials and burial sites. Bocek (1992) reported that *Thomomys* gophers often redistributed items in disproportionate ways; smaller items were moved nearer to the surface while larger items settled to greater depths.

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21.3.7 Invasive Plant Establishment and Dispersal

The disturbance of soil and seed dispersal by rodents has been suggested to enhance the establishment of invasive plant species (e.g., Case and Jasch 1994; Hobbs and Mooney 1991). The large increase in bare soil on the surface resulting from pocket gopher burrowing provides abundant germination sites for annual plants. The magnitude of this effect on the establishment and spread of invasive plants has not been well documented and the relationships between abiotic and biotic factors can be quite complex (see Reichman, this volume).

21.4 Pocket Gopher Damage Management

Because of the extensive nature of pocket gopher damage, many tools, methods, and strategies have been developed to reduce populations and damage (Case and Jasch 1994; Engeman and Witmer 2000; Marsh 1992). With rodents, the amount of damage is often related to the population density; hence, one approach to damage reduction is to reduce the pocket gopher population in the area of the damage. A second approach is to reduce the area's carrying capacity for pocket gophers, or to provide protection to specific resources so that they are less likely to be damaged by pocket gophers living in the area. Often a combination of methods is the best way to achieve significant rodent damage reduction. This concept of Integrated

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Pest Management (IPM) has been elaborately developed for many pest groups (insects, weeds, disease organisms and their vectors), but less so for vertebrate pests. In dealing with rodent pests, Singleton et al. (1999) took this concept a step further and proposed an “ecologically-based rodent pest management” system that goes well beyond the traditional, heavy reliance on toxic rodenticides. We briefly review the various methods employed to reduce damage by pocket gophers.

21.4.1 Pocket Gopher Population Control

Humans around the world have relied on kill traps and rodenticide baits as the main tools to reduce damage by rodents, although many other methods have been used with varying levels of success (Witmer et al. 1995a). The use and effectiveness of traps for pocket gopher control has been reviewed by Marsh (1998), Pipas et al. (2000), Proulx (1997), and Witmer et al. (1999).
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One of the main problems with traps is they are very labor intensive to use. Because pocket gopher traps are placed down in the burrow, non-target animal losses are generally relatively low.

Rodenticides currently registered in the USA for use in pocket gopher control include chlorophacinone, diphacinone, strychnine, and zinc phosphide (Case and Jasch 1994). Burrow fumigants (gas cartridges, aluminum phosphide pellets) are also registered for gopher control (Baker RO 2004; Case and Jasch 1994). Marsh (1992) discussed the history of rodenticide use for gopher control in California, including several rodenticides no longer registered for that purpose. Other rodenticides, such as cholecalciferol, have proven effective in gopher control and may be registered for that use in the future (Witmer et al. 1995b). Most rodenticides can be classified as anticoagulants, which are further broken down into first and second generation materials, and the acute toxicants (see Timm 1994). The first generation anticoagulants (e.g., warfarin, chlorophacinone, diphacinone) are relatively lower in toxicity and require multiple feedings over several days before they are lethal to the rodent. The second generation anticoagulants (e.g., bromaliolone, brodifacoum) are more potent and were developed starting in the early 1970s when genetic resistance to first generation

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anticoagulants began to occur. Anticoagulants are used in relatively low concentrations (0.0025–0.005%) and an antidote (vitamin K) exists in case of accidental intoxication of people, pets or livestock. The acute toxicants (e.g., zinc phosphide, strychnine, cholecalciferol, bromethalin) are toxic to most vertebrates and may kill rodents with a single feeding. Rodenticides are carefully regulated by federal, provincial, territorial, and state agencies to assure proper use and to reduce adverse effects. Concerns with rodenticide use revolve around primary and secondary poisoning hazards, residue bioaccumulation, and environmental persistence. Because pocket gopher rodenticide baits are placed within the burrow which is then sealed over, the hazards to non-target animals are relatively low. In general, the use of rodenticide baits (\$30/ha) is more cost effective than the use of traps (\$100/ha; Proulx 2002). Use of a tractor-drawn burrow builder that systematically dispenses bait into the burrow as it is created can keep costs even lower (\$6/ha; Proulx 2002).

Pocket gopher populations can be quickly reduced with traps or rodenticides, but they typically recover within a year to pre-control levels (Engeman and Campbell 1999; Engeman and Witmer 2000). For this reason, Proulx (2002) recommended the implementation of a “border control” strategy. After an area is cleared of pocket gophers, some trappings (or bait applications) are continued around the perimeter to reduce the re-invasion rate.

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21.4.2 Habitat Management and Resource Protection

Some land management activities can help reduce pocket gopher densities and damage. These include the use of less palatable species or varieties of plants, crop rotation, alteration of planting and harvesting dates, flood irrigation, less canopy removal with forest harvest, less ground surface disturbance (to discourage herbaceous plant invasion of the site), use of herbicides or livestock to reduce ground forage, and encouragement of natural predation (Case and Jasch 1994; Engeman and Witmer 2000). For some situations, increasing the seedling stocking rate may be an effective and less costly alternative to other more expensive or legally restricted

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damage control methods (Engeman et al. 1998). Pocket gophers generally prefer to feed on forbs (dicots) over grasses (monocots) (Keith et al. 1959). Consequently, the selective removal of forbs with the herbicide 2,4-D has reduced *Thomomys* gopher densities (Keith et al. 1959; Tietjen et al. 1967). Individual trees can also be protected with barriers made of small mesh wire or plastic tubes (Engeman et al. 1999a; Engeman and Witmer 2000). Unfortunately, this is costly because of initial material cost, the cost of maintenance, and overall labor cost. Care must also be taken to assure that the barriers do not affect the growth form of the trees and do not create a lethal thermal microclimate around seedlings.

There has been considerable research on pocket gopher repellents to protect trees, but these have not proven effective (Engeman and Witmer 2000). Some researchers feel predator odors (urine or feces) help keep rodents out of areas, but this has not been well documented (Witmer et al. 1997). Sonic or vibrator devices have not proven effective at driving underground rodents from an area (Timm 2003).

21.4.3 Population Densities and Monitoring

Densities of pocket gophers are highly variable. For *Thomomys*, densities are commonly 40–50 per ha, but can be as high as 153 per ha (Case and Jasch 1994). For *Geomys*, densities are usually no greater than 20 per ha (Case and Jasch 1994). Densities are considered to be influenced by such factors as local climate, soil suitability, body mass, and vegetation types (Baker RJ et al. 2003). Sharp declines in gopher populations have occasionally been noted. These are usually related to a climatic factor such as a rapid snowmelt with a subsequent rise in the ground water level (Case and Jasch 1994). Pocket gopher populations, however, do not exhibit regular cycles in densities like those observed with some microtine species.

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Monitoring the level and distribution of activity for pocket gopher populations is essential to the decision-making process on whether and where to apply control technologies. Subterranean animals must be observed indirectly, using signs to reflect abundance, distribution, and level of activity. Forest pocket gopher activity usually is assessed by examining sample plots

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for newmounds (Anthony and Barnes 1984) or monitoring opened burrows for closure (Richens 1967). Mound building activity fluctuates seasonally, whereas pocket gophers always try to maintain closed burrow systems. *Thomomys* gopher burrow systems have a single occupant during much of the year. Thus, open-hole assessments are most valuable when assessing the effectiveness of direct population control measures (Engeman et al. 1993). Generally, two or three holes are opened in each burrow system and rechecked for closure after 24–48h. Hole closure indicates an occupied burrow system. Parameters for applying the open-hole method have been optimized to maximize sensitivity of the results relative to in-field labor (number of holes opened and size of activity plots; Engeman et al. 1999b). The open-hole method is more difficult to interpret for species having more than one burrow occupant (Matschke et al. 1994).

21.5 Conclusions and Future Needs

Pocket gophers are subterranean rodents widely distributed across Canada, the United States, and south to Panama. Pocket gophers cause substantial damage to a wide array of resources through their foraging, burrowing, and gnawing habits. Population control measures are frequently implemented to reduce their numbers and subsequent damage. Control requires a diligent, long-term commitment with substantial funds, because pocket gophers can achieve high densities and rapidly reinvade sites having good resources. Thus, control should not be undertaken unless significant damage levels are anticipated.

More research is needed to understand better the nature of pocket gopher damage to crops and other resources, and ways in which to reduce that damage. Evaluations of existing methods are still needed in many places. The ability to develop new, safe, and effective methods of rodent damage management will depend on many factors, besides laboratory, pen, and field trials: funding, actions by regulatory agencies, interest and involvement by commercial developers of methods and products, and pressures by agricultural producers, special interest groups, and the general public.

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(<http://ag.utah.gov/divisions/plant/pesticide/documents/VertebrateAnimalPestStudyGuide.pdf>)

VERTEBRATE ANIMAL PEST MANAGEMENT

Study Guide for Pesticide Application and Safety
Category 12



Utah Department of Agriculture and Food
Division of Plant Industry
350 North Redwood Road
Salt Lake City, Utah 84114-6500

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POCKET GOPHERS - BIOLOGY AND BEHAVIOR

Pocket gophers are burrowing rodents, 7 to 13 inches long and weighing 3 to 14 ounces, that spend most of their lives below ground. They are named for the fur lined cheek pouches located along side of the mouth. The

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pockets are used to carry food. Gophers have powerfully built forequarters with large claws on their front feet, a short neck, external ears, small eyes, and lips that close behind their large incisors.

Four species of pocket gophers are found in Utah. The four species are distributed in almost entirely different areas, possibly because of different ecological requirements or competition. Plains pocket gophers are abundant in sandy and silty soils of the plains, but they are not abundant in compacted soils.

The northern pocket gopher can be found in the deep, sandy soils of the plains and in the shallow gravel of mountainous areas. It is the most common species in mountain rangelands and forests. The valley pocket gopher is found mainly in soils of warm valleys in southern Utah.

The yellow-faced pocket gopher inhabits a portion of the area in southeastern Utah where the plains pocket gopher is found. However, the yellow-faced pocket gopher is confined to drier sites or sites with soils that are less favorable for the plains pocket gopher.

Pocket gophers attain the highest densities on light textured soils with good herbage production. Shallow soils limit pocket gopher populations because of tunnel cave-in and poor insulation from summer and winter temperatures.

Pocket gophers build burrow systems by loosening the soil with their claws and incisors. Gophers then use their forefeet and chest to push the soil out of the burrow. The soil is deposited in fan shaped mounds 12 to 18 inches wide and 4 to 6 inches high.

Burrow systems consist of a main tunnel 4 to 18 inches below the soil surface and numerous lateral burrows extending from the main. Lateral burrows end with a soil mound or a soil plug at the surface. Burrows are 2 to 3 1/2 inches in diameter depending on the size of the gopher. A burrow system varies from linear to highly branched and may contain up to 200 yards of tunnels and several mounds. Mound building by a single gopher brings 1-1/4 to 2-1/4 tons of soil to the surface each year.

Pocket gophers usually breed in the spring and produce 1 litter of 3 to 6 young after a gestation period of about 20 days. Usually, only 1 adult is found in each burrow system except during breeding and while raising young. Six to 8 plains pocket gophers per acre are considered high densities, whereas northern pocket gophers occasionally reach densities of 20 per acre. Young pocket gophers usually begin dispersing from the natal burrow in June, when about half grown.

Pocket gophers feed on roots encountered while digging, vegetation pulled into the tunnel from below, and aboveground vegetation near the tunnel. Pocket gophers prefer aboveground vegetation that is green and succulent. Pocket gophers prefer succulent forbs in spring and summer, but they also feed on grasses. Many trees and shrubs are clipped just above ground, especially under snow cover.

DAMAGE

Pocket gophers reduce the productivity of those portions of alfalfa fields and native grasslands on which they are found by 20 to 50 percent. If gophers are present on 10 percent of a field, they may reduce overall forage productivity of the field by 2 to 5 percent. Gopher mounds damage and interfere with hay harvesting equipment. Gophers sometimes damage trees by girdling or clipping stems and by pruning roots. Gophers may, at times, destroy underground utility cables and irrigation lines.

On the other hand, gophers are beneficial in several ways. Their burrowing activities increase soil fertility by adding organic matter in the form of plant materials and feces. The burrowing reduces soil compaction and increases water infiltration, soil aeration, and the rate of soil formation.

CONTROL METHODS

Exclusion

Pocket gophers can be excluded from valuable plots of ornamental trees and shrubs with a 0.25 inch to 0.5 inch mesh hardware cloth fence buried at least 18 inches. In shallow soil, the fence should be placed at least 2 feet from the nearest plants to avoid root injury. This method is of limited practicality because of expense and labor.

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Cultural Methods

Varieties of alfalfa with several large roots rather than a single taproot suffer less when pocket gophers feed on them.

Rotating alfalfa with grain crops effectively controls pocket gophers because annual grains do not produce large enough roots to support gophers year round.

Buffer strips of grain around a hay field provide unsuitable habitat and can reduce immigration of pocket gophers.

Control of broadleaf forbs with herbicide treatments can effectively control northern and valley pocket gophers and cut damage to rangelands. This method is less effective for plains pocket gophers because they easily survive on grasses. In orchards and shelterbelts, control of forbs will sometimes limit gopher damage.

Flood irrigation can effectively control pocket gophers especially in fields that have been leveled to remove high spots that might serve as refuges. The wet flooded soil generally prevents diffusion of gases in and out of the burrow and sticks to the pocket gopher's fur and claws creating an inhospitable environment.

Trapping

Trapping is a method of reducing pocket gopher populations on fields and removing the remaining animals after a poison control program. Body gripping traps such as the Death Clutch 1, Macabee, Victor, or Guardian Gopher Trap are available to capture gophers. Traps can be set in the main or lateral tunnel, preferably near the freshest mounds. A circular plug, sometimes a depression, in the fan shaped mound, identifies the lateral tunnel.

Probing the lateral tunnel depression will allow the tunnel direction to be determined. The plug can be dug out and a trap, secured to a chain and marker stake, can be inserted with the body gripping jaws about 6 to 8 inches into the tunnel. The chain is attached so the gopher cannot pull the trap into the tunnel and also so other animals will not be able to remove the trap if they take the gopher.

Traps can also be set in the main tunnel about 12 to 18 inches from the mound. After uncovering the main tunnel with a shovel, set 2 traps, 1 in each direction. The 8 tunnels can be left open or covered after setting traps. Traps should be checked twice daily since gophers often visit the traps within a few hours. If a trap is not visited within 48 hours, move it to a new location. Trapping is usually more successful in the spring and fall when gophers are actively building mounds.

Baiting

Bait can be placed into a burrow system by hand after opening the main tunnel with a hand probe. To place bait in the burrow system by hand, locate the main by digging with a shovel 12 to 18 inches from the plug side of the mound. Place the recommended amount of bait, following label directions, in each direction of the opened main tunnel and well into the system. Close off each tunnel with sod clumps and soil so gophers do not try to close the system and cover the bait with soil.

A less time consuming baiting method involves using a pointed rod hand probe. Locate the main tunnel 12 to 18 inches from the plug side of the mound by pushing the probe into the ground. The decreased friction on the probe indicates the location of a tunnel. This type of probe can also be used with trapping to locate the tunnels.

Bait can be placed through the probe hole into the tunnel. A reservoir type bait probe dispenser is also available for poisoning gophers. Place the recommended amount of bait down each of 2 or 3 probe openings then cover the probe holes with sod.

Mechanical Burrow Builder

The burrow builder mechanically delivers poisoned bait underground to economically control pocket gophers on large acreages. A tractor pulls the burrow builder. The device consists of a knife and torpedo assembly that makes an artificial burrow at desired soil depths.

A blade cuts roots of plants ahead of the knife, a seeder assembly dispenses bait, and a packer wheel closes the furrow behind. The seeder dispenses poison baits. Burrow builders can be used successfully if the soil is not extremely dry.

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To achieve good results with a burrow builder:

1. Adjust the burrow builder to build tunnels at the same depth as those built by gophers in your area so gophers intercept the tunnels.
2. Use the machine only when the soil moisture is adequate, because if the soil is too dry, the burrow may collapse, and if the soil is too wet, the slot over the tunnel may not close. Generally, the soil moisture is adequate if it is damp enough so that a compressed handful will hold its shape.
3. Space the burrows at 20 to 30 foot intervals in areas of infestation. Burrow spacing depends on gopher densities and species involved; usual spacing is 20 to 25 feet for the northern and valley pocket gophers and 25 to 30 feet for the plains and yellow-faced pocket gophers.
4. Periodically check that bait is dispensing down the tube.
5. Enclose the perimeter of the field with artificial burrows to prevent reinvasion.
6. Follow directions provided with the burrow builder machine. Recommended application rates of 1 to 2 pounds per acre of 0.35 to 0.5 percent strychnine provides 85 to 95 percent control.
7. Any spilled bait should be cleaned up and disposed of properly. Any dead gophers found above ground should be buried to reduce hazards of secondary poisoning to predators and scavengers.
8. To improve the effectiveness of this control method, harrow the field a week after treatment to level mounds, then retreat by hand and/or trap at new mounds.

Baits

Baits registered for pocket gophers control in Utah include strychnine from 0.35 to 0.5 percent, zinc phosphide at 2 percent, and chlorophacinone at 0.005 percent. Some of these are restricted use pesticides and some are general use.

Baits formulated on milo, barley, or wheat are widely used toxicants. They are usually labeled as restricted use pesticides because they are highly toxic and potentially hazardous to all wildlife. Underground baiting presents minimal hazards to nontarget wildlife, but any grain spilled on the surface may be hazardous to ground feeding birds or mammals.

Fumigants

Several types of materials and devices are available for fumigating pocket gophers. Fumigants are not very successful for controlling pocket gophers because either the gophers sense the poisonous gas and plug the tunnel or the soil is too dry and the fumigants do not diffuse properly.

LEGAL STATUS

State or federal laws do not protect gophers when they are on agricultural lands or private property.

(<http://www.cdpr.ca.gov/docs/license/vertebrate.pdf>)

**KNOWLEDGE EXPECTATIONS FOR PEST CONTROL ADVISERS:
VERTEBRATE PEST MANAGEMENT**

I. LAWS AND REGULATIONS

List the laws and regulations pertinent to vertebrate pest management.

(California Department of Fish and Game Code, Migratory Bird Treaty Act, Endangered Species Act, California Department of Food and Agriculture Administrative Code, County Interim Measures Bulletins, local ordinances)

Describe how different laws and regulations may pertain to the control of specific vertebrate pests and how they influence:

which species can be controlled;

the techniques or methods used;

the safeguards needed to protect nontarget species.

List the agency or agencies which enforce laws and regulations pertinent to vertebrate pest management.

(USEPA, US Fish and Wildlife Service, California Department of Fish and Game, California Department of Food and Agriculture, California Department of Pesticide Regulation, County Agricultural Commissioner, State Highway Patrol)

Describe how more than one law or regulation may apply to the control of the following pests:

ground squirrels;

tree squirrels;

crows.

Recognize that information on laws and regulations pertaining to vertebrate pest management can be found in the study guide.

(California Vertebrate Pest Control Handbook; Prevention and Control of Wildlife Damage, Volumes 1 and 2.)

Recognize the role of the County Agricultural Commissioner as the first source for site specific information regarding vertebrate pest management.

cognize that pest control recommendations that violate the Endangered Species Act may result in criminal charges.

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II. VERTEBRATE PEST ID

Be familiar with the following vertebrates and know which are pests. For pest species, understand their general biology and ecology and management tactics for their control.

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Birds:

blackbirds
burrowing owls
cedar waxwings
cliff swallows
crowned sparrows
crows
egrets
geese
gold finches
gulls
herons
horned larks
house finches (linnets)
house sparrows
kingfishers
magpies
pheasants
pigeons
robins
scrub jays
starlings
terns
wild turkey
woodpeckers

Mammals:

bats
bears
beaver
bobcats
chipmunks
coyotes
deer
feral dogs
fox
marmots
moles
3
mountain lions
nutria
opossums

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pocket gophers

porcupines

rabbits, hare

raccoons

skunks

wild pigs

Squirrels:

Belding's ground squirrel

fox tree squirrels

ground squirrels

tree squirrels

Rats and Mice:

cotton rats

muskrats

Norway rats

roof rats

wood rats

deer mice

house mice

meadow voles

Threatened and Endangered species:

blunt-nosed leopard lizards

Fresno kangaroo rats

giant kangaroo rats

Morro Bay kangaroo rats

salt marsh harvest mice

San Joaquin kit fox

Stephen's kangaroo rats

Tipton kangaroo rats

4

Define vertebrate pest.

Define fossorial and commensal.

Describe characteristics which make an animal a pest.

(high reproductive rate, high density-congregating behavior, propensity for feeding on crop, overabundance, value of crop being damaged, nuisance behaviors, vectors or reservoirs for disease)

A. Identification

Identify the major mammal pests in California agriculture.

(meadow voles, ground squirrels, deer, jack rabbits, pocket gophers, wild pigs, coyotes)

Identify the major bird pests in California agriculture.

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(starlings, house sparrows, horned larks, jays, crows, crowned sparrows, gold finches, magpies, linnets, woodpecker, blackbirds, wild turkey, swallow, pigeon)

Describe ways in which the identity of a vertebrate pest might be confirmed.

(trapping, look for further signs such as tracks, droppings or hair, direct observations, location and patterns of damage, time of day that damage occurs)

List resources to assist in vertebrate pest identification.

(handbook, Peterson bird ID book, UC Publication 21385, Animal Tracks by O. J.

Murie, Mammals of the Pacific States)

B. Pests and Crop or Environment Associations

List the vertebrate pests most commonly associated with the following agricultural crops:

strawberries (gold finches, ground squirrels, meadow voles);

grapes (starlings, pocket gophers);

sugarbeets (meadow voles, ground squirrels);

nut trees (crows, magpies, jays, pocket gophers, ground squirrels, tree squirrels);

deciduous fruit trees (meadow voles, pocket gophers, linnets, starlings);

citrus (meadow voles, roof rats, ground squirrels);

alfalfa (California and Belding's ground squirrels, pocket gophers, jack rabbits);

forage crops (ground squirrels, meadow voles);

tomatoes (meadow voles);

lettuce (horned larks);

rice (Norway rats, muskrats, blackbirds).

List the vertebrate pests that commonly cause problems in forestry.

(pocket gophers, deer, mountain beaver, rabbits, tree squirrels, porcupines)

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List the vertebrate pests that commonly cause problems at cattle feedlots, dairies, and poultry and pork producing facilities.

(starlings, house sparrows, pigeons, blackbirds, Norway rats, roof rats, house mice)

List the predators responsible for major livestock losses in California.

(mountain lions, coyotes, dogs)

List the mammals that are often considered nuisance pests in suburban and urban environments.

(opossums, skunks, raccoons, bats, tree squirrels)

List the birds that are often considered nuisance pests in suburban and urban situations.

(geese, starlings, crows, swallows)

List the vertebrate pests that are considered of significance to public health.

(Norway rats, roof rats, bats, deer mice, ground squirrels, skunks)

List the vertebrates that are major pests of stored commodities and food processing facilities.

(Norway rats, roof rats, house mice, pigeons, house sparrows)

C. Distribution

Recognize that the following vertebrate pests are of limited distribution or occupy specific habitats:

cotton rats;

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Belding's ground squirrels;
mountain beavers;
feral pigs;
marmots.

D. Nature of Pest Damage

Recognize signs and symptoms used to identify damage caused by the following vertebrate pests:

meadow voles;
moles;
ground squirrels;
tree squirrels;
deer;
jack rabbits;
house finches (linnets);
horned larks;
crows;
pocket gophers;
raccoons;

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skunks;
wild pigs;
deer mice;
house mouse;
roof rat;
marmot;
cotton rat;
Norway rat;
wood rat;
muskrats.

List the vertebrate pests associated with the following damage symptoms:

girdling of trees—above ground;
girdling of trees—below ground;
vegetable seedling damage;
disbudding of deciduous fruit trees;
damage to ripening fruit;
damage to drip irrigation systems.

Differentiate between the types of damage caused by the following vertebrate pests:

mole and pocket gopher in turf;
pocket gophers and ground squirrels in field crops;
rodent and birds in seedling row crops;
carnivore and rodent damage to drip irrigation.

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Recognize the bird pest and the damage or problem caused in:

aquaculture facilities (herons, gulls, terns, kingfishers);

buildings – nesting in or on (pigeons, swallows, house sparrows)

List the vertebrate pests that are associated with damage to levees and earthen dams.

(beaver, muskrat, ground squirrel, pocket gopher)

E. Native or Introduced Pests

Recognize that the following vertebrate pests are not native to California:

opossums;

starlings;

pigeons;

house sparrows;

house mice;

roof rats;

Norway rats;

fox tree squirrels.

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III. VERTEBRATE PEST BIOLOGY AND ECOLOGY

A. Population Dynamics

Describe how vertebrate pest populations may be influenced by:

litter size;

number of litters per year;

cyclic population trends.

Describe how vertebrate pest populations may be limited by the following external factors:

food source and abundance;

shelter;

water;

predators/diseases.

B. Behavioral Characteristics

Describe how the following may influence management:

Hibernation/estivation;

dietary changes;

bait shyness;

neophobia;

cover or shelter;

activity patterns (diurnal/seasonal).

C. Habitats

Describe the natural habitats of the following pests:

meadow voles;

moles;

ground squirrels;

tree squirrels;

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deer;

jack rabbits;

house finches (linnets);

horned larks;

rats.

Describe the visible differences between the burrows of the following vertebrate pests:

meadow voles;

moles;

pocket gophers;

ground squirrels;

Describe how to distinguish between an active and inactive burrow.

8

Describe how to determine if a ground squirrel burrow is being used by a target pest species or by one of the following nontarget species :

burrowing owl (white wash);

kit fox (key hole shape)

D. Disease Carriers

Identify the pest(s) most often associated with the following diseases:

plague (ground squirrels and chipmunks);

histoplasmosis (pigeons);

leptospirosis (rats);

hantavirus (deer mouse);

lyme disease (deer);

rabies (skunks and bats);

salmonellosis (rats and mice).

Identify the most common methods of human exposure for each of the following diseases:

plague;

histoplasmosis;

tularemia;

salmonellosis;

hantavirus;

lyme disease;

rabies.

Describe the importance of ectoparasite control:

when carrying out ground squirrel and chipmunk control in areas of high plague potential;

in association with commensal rodent control or bat exclusion.

IV. VERTEBRATE PEST MANAGEMENT

A. Assessing the Problem and Determining Strategies

Describe the steps taken to assess a vertebrate pest problem.

(ID species, location of damage, survey extent, severity and type of damage, trapping)

Attachment to James Goche's comment

List the factors that must be considered in determining whether a control action should be taken.
(cost of control, efficacy of control, time of year, cost of damage and risk of future damage, environmental concerns, human health concerns)

Describe how the following short- and long-term solutions may differ and when each may be the best choice:

shooting deer vs. deer proof fence;

9

acute poison vs. habitat management for meadow voles.

Describe several key management options available for controlling the following vertebrate pests in nut crops:

ground squirrels;

crows;

meadow voles;

jays.

Describe how a combination of methods in an integrated pest management program would be used over time to manage:

ground squirrels;

meadow voles;

roof rats.

B. Environmental Management and Manipulation, Including Crop Cultural Practices

Describe how the following sanitation practices in urban situations can impact vertebrate pests:

food removal;

cleaning up rotten fruit;

removing bird feeders;

removing wood piles;

eliminating cover/ivy;

eliminating water sources;

eliminating bird nesting sites.

Describe the impact of the following cultural practices on vertebrate pests in crop situations:

irrigation methods;

crop type and variety;

field border sanitation;

cover crops;

tree row herbicide treatments;

burrow destruction;

crop rotation;

cultivation.

C. Exclusion

Describe how the following might be used to prevent damage or pest access:

deer fencing/exclusion fencing (deer);

Attachment to James Goche's comment

electric fencing (coyotes, deer, raccoons, bears);
tree guards (rabbits, deer, voles, deer mice, rats);
netting (birds);
wire mesh planting baskets (gophers).

10

Recognize the importance of removing animals (and their progeny) from buildings before installing exclusion materials.

(bats, raccoons, skunks)

D. Frightening Methods

Describe how each of the following bird frightening devices or methods might best be used, alone or in combination, to temporarily protect orchard or vine crops from damage:

propane exploders;

reflective tapes;

eye balloons;

distress calls;

cracker shells;

electronic noisemakers.

Explain how habituation may influence the effectiveness of many frightening methods.

E. Trapping

List pests for which the following traps would be used:

modified Australian crow trap (starlings, linnets);

Macabee (gophers);

Out O' Sight (moles);

Havahart/cage-type live-traps (skunks, raccoons);

modified California-type box trap (ground squirrel);

Conibear-type trap (ground squirrels);

soft catch leghold traps (coyotes, fox);

harpoon (moles);

glue boards (house mouse).

Explain how CO₂ can be used to euthanize live trapped animals.

Recognize that translocation of vertebrate pests, such as ground squirrels, pocket gophers, and skunks is illegal according to California law.

F. Shooting and Hunting

List vertebrate pests that may be controlled by shooting or hunting.

Recognize that local fire arm restrictions may apply when using shooting or hunting to control vertebrate pests.

G. Chemical Repellents

Describe how chemical repellents deter vertebrate pests.

11

(tactile/sticky compounds make area unpleasant, by odor, by taste, combination of taste and odor)

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List example of types of chemical repellents that are used against the following pests:

pigeons;

deer;

rabbits;

geese.

Explain why the usefulness and effectiveness of sticky type repellents may be limited.

(time consuming to apply, adversely affected by temperature, dust readily adheres to them; must be reapplied periodically, difficult to remove)

Explain why chemical repellents are not an effective long term solution for the control of deer.

H. Chemical Lethal Control

List the active ingredients registered as rodenticides, including burrow fumigants and predacides.

(strychnine; zinc phosphide; burrow fumigants—aluminum phosphide, gas cartridges; anticoagulants—chlorophacinone, diphacinone, warfarin; predacides—sodium cyanide, sodium fluoroacetate)

Describe the characteristics, including the capabilities and limitations, of baits and burrow fumigants.

Understand primary and secondary poisoning. (Primary poisoning is the toxic effects of a substance on an organism that directly consumes the poison, whether it be the target organism or not. Secondary poisoning occurs when an organism comes in contact with and is poisoned by another organism that was poisoned; ex. a dog eats a poisoned rodent and gets sick).

Identify how the following items relate to specific rodenticides:

mode of action of anticoagulants;

effectiveness for various target pests;

potential for producing primary poisoning in nontarget species;

potential for secondary poisoning in nontarget species;

which have effective antidotes;

potential for producing 'bait shyness';

restricted or nonrestricted use category.

i. Baits

Describe how the following can influence effectiveness of a vertebrate pest control program using baits:

pre-baiting;

12

testing bait acceptance;

timing (seasonal) of baiting;

frequency of baiting;

bait shyness.

Name the rodenticides which are presently registered for baiting field rodents.

(bromethalin; cholecalciferol; second generation anticoagulants—bromadiolone, brodifacoum, difethialone)

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Describe how the following procedures can help avoid primary or secondary poisoning of nontarget species:

- the use of bait stations;
- removal of rodent carcasses;
- using the least toxic rodenticide;
- use of traps instead of baits;
- bait storage out of the reach of domestic animals.

Describe how the following conditions affect bait efficacy:

- bad odors;
- moldy;
- insect infested;
- age.

Describe the different methods used for applying rodent baits.

(burrow builder, broadcast, spot bait, bait station)

Identify situations that favor the use of the following rodent bait application methods:

- bait boxes;
- spot baiting;
- mechanical broadcasting;
- burrow builder.

List vertebrate pests where the use of paraffin baits might be utilized.

(Norway rats, pocket gophers, muskrats)

List the advantages of paraffin baits in vertebrate pest control.

(easily handled and stored, weather resistant, resistant to molds and insects, unattractive to birds)

List the reasons for using colored baits.

(required by law; helps identify treated vs. nontreated, birds are repelled by colors and rodents are color blind)

13

ii. Fumigants

Describe the appropriate application methods for the use of burrow fumigants.

Describe how the following factors may influence burrow fumigant effectiveness:

- soil moisture;
- soil texture;
- time of year;
- temperature.

I. Biological Control

In predator/prey relationships explain why the number of prey often determines the number of predators and not vice versa.

J. Environmental Considerations

Describe how a field assessment is made to determine if and which nontarget species including threatened and endangered species may be at risk.

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Describe how the following are used to assist in safeguarding nontarget species:

fumigation of active holes only;

use of color-dyed baits;

bait boxes with three-inch openings (exclude kit fox);

elevated bait stations (exclude kangaroo rats);

referencing county bulletins.

Describe how to find out which threatened and endangered species in the area of treatment might be at risk from rodent control.

(Fresno kangaroo rat; giant kangaroo rat; Morro Bay kangaroo rat; salt marsh harvest mouse; San Joaquin kit fox; Stephen's kangaroo rat; Tipton kangaroo rat; blunt-nosed leopard lizard)

K. Economic Evaluations and Considerations

List the economic factors to be considered in vertebrate pest control programs.

Describe how the cost of vertebrate pest control can be compared with the benefit of control.

Describe why benefits may have to be assessed for several years beyond the year of control.

(<http://wdfw.wa.gov/living/gophers.html>)



Living
with
Wildlife

Pocket Gophers



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Figure 1. Pocket gophers (Northern pocket gopher shown here) are stout-bodied rodents with small ears and eyes and large clawed front paws. Their large front teeth are used to loosen soil and rocks while digging, as well as to cut and eat roots. *(Photo by Ty Smedes.)*

In some areas, the name gopher is applied to a variety of mammal species including ground squirrels and moles. True pocket gophers are burrowing rodents that get their name from their fur-lined cheek pouches, or pockets. These pockets are used, like a squirrel's, for carrying food. However, the pockets on a gopher open on the outside and turn inside out for emptying and cleaning.

Pocket gophers are well-equipped for a digging, tunneling lifestyle, with large-clawed front paws, small eyes and ears, and sensitive whiskers that assist with movement in the dark (Fig. 1). Their pliable fur and sparsely haired tails—which also serve as a sensory mechanism—help

Attachment to James Goche's comment

gophers run backward almost as fast as they can run forward. Their large front teeth are used to loosen soil and rocks while digging, as well as to cut roots (Fig. 2).

The pocket gopher's short fur is a rich brown or yellowish brown, but also may be grayish or closely resemble the local soil color.

Two species of pocket gophers occur in Washington: the **Northern pocket gopher** (*Thomomys talpoides*) is the smallest and most widespread, occupying much of eastern Washington. Adults of this species measure 8 inches in length, including their 2-inch tail. The **Mazama (Western) pocket gopher** (*Thomomys mazama*) is the only pocket gopher in most of western Washington—in the Olympic Peninsula and the southern Puget Sound area. Adults measure 8 inches in length, including their 2½-inch tail (see “[Mazama Pocket Gopher Conservation](#)”).

Pocket gophers can be a problem for homeowners, but they actually benefit the soil and vegetation in many areas. Unfortunately, the positive effects are not as visible as the mounds pocket gophers create in lawns and pastures.

Facts about Washington's Pocket Gophers

Food and Feeding Habits

- Unlike moles, which mostly eat insects and other invertebrates, pocket gophers only eat vegetation.
- Gophers eat roots, bulbs, and other fleshy portions of plants they encounter while digging underground.
- Gophers also eat the leaves and stems of plants around their tunnel entrances and can pull entire plants into their tunnels.
- In areas with a snowpack, gophers will gnaw on bark several feet up a tree or shrub.
- Because gophers obtain sufficient moisture from their food, they don't need a source of open water.

Reproduction and Social Structure

- Pocket gophers breed from early spring to early summer, resulting in one litter of three to seven young per year.
- The nest chamber is located in the pocket gopher's burrow system, is about 10 inches in diameter, and is lined with dried vegetation.
- The young develop quickly, remain in the nest for five to six weeks, and then wander off above ground to form their own territories.
- Pocket gophers are solitary except during the breeding season or when females have young with them.
- Densities of northern pocket gophers have been found to range from 2 to 20 gophers per acre, depending on food availability,

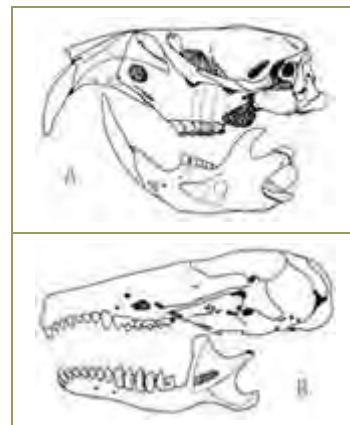


Figure 2. Lateral views the skull of a pocket gopher (a) and a mole (b) show the differences in their teeth. A pocket gopher's teeth are adapted for gnawing on plant material, and a mole's long jaws and multiple teeth are adapted for consuming small insects. (*From Verts and Carraway, Land Mammals of Oregon.*)

Attachment to James Goche's comment

species, and ages of the gophers.

Mortality and Longevity

- Coyotes, domestic dogs and cats, foxes, and bobcats capture gophers at their burrow entrances; badgers, long-tailed weasels, skunks, rattlesnakes, and gopher snakes corner gophers in their burrows. Owls and hawks capture gophers above ground.
- A deep snowpack can result in high gopher mortality. If the snow melts rapidly it saturates the ground and floods the burrows.
- Pocket gophers live one to two years and the majority of the population consists of young adults.

The Benefits of Pocket Gophers

A typical pocket gopher can move approximately a ton of soil to the surface each year. This enormous achievement reflects the gopher's important ecological function.

Their tunnels are built and extended, then gradually fill up with soil as they are abandoned. The old nests, toilets, and partially filled pantries are buried well below the surface where the buried vegetation and droppings become deep fertilization. The soil thus becomes mellow and porous after being penetrated with burrows. Soil that has been compacted by trampling, grazing, and machinery is particularly benefited by the tunneling process.

In mountainous areas, snowmelt and rainfall are temporarily held in gopher burrows instead of running over the surface, where they are likely to cause soil erosion.

Surface mounds created by gophers also bury vegetation deeper and deeper, increasing soil quality over time. In addition, fresh soil in the mounds provides a fresh seedbed for new plants, which may help to increase the variety of plants on a site.

Many mammals, large birds, and snakes eat gophers and depend on their activities to create suitable living conditions. Salamanders, toads, and other creatures seeking cool, moist conditions take refuge in unoccupied gopher burrows. Lizards use abandoned gopher burrows for quick escape cover.

Viewing Pocket Gophers

Although pocket gophers are active year-round and at all hours of the day, their underground lifestyle makes them difficult to observe.

If you are patient, you may be able to watch a pocket gopher feed above ground, or see their food being taken underground. The Mazama pocket gopher spends the most amount of time above ground, generally at night and on overcast days.

Attachment to James Goche's comment

When sitting in a grassy area, keep your eyes and ears alert for the sight and sound of a wiggling clump of grass, wild flowers, or similar vegetation. You might see the entire plant slowly disappear below ground, and a few minutes later, the same gopher may venture a body length's distance from its tunnel opening to alertly feed or gather food.

When gathering food above ground, a pocket gopher will cut vegetation quickly, cram as much as possible into its external pouches (or pockets), and then disappear below ground. It may reappear in a few minutes, gather more food, and disappear to consume the food underground or store it away for later.

Pocket gophers live in extensive burrow systems, which they use for locating food, rearing young, storing food and droppings, and escaping predators. Burrow systems are a closely regulated microenvironment, and gophers will plug any openings in the system within 24 hours. Evidence of a gopher's burrow system includes mounds, soil plugs, and winter soil casts.

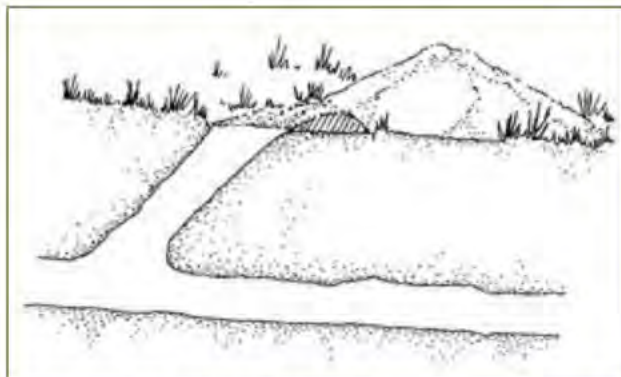


Figure 3. The side view of a portion of a pocket gopher's burrow system showing the mound, the short, sloping lateral tunnel, and the deeper main tunnel. *(Drawing by Jenifer Rees.)*

Mounds

As a pocket gopher tunnels, it loosens soil with its front legs. When digging becomes difficult, it bites off chunks of earth or roots with its incisors. The gopher then somersaults to turn around and push the loose earth and other debris to the surface bulldozer style, with its front feet and head. The excavated material is pushed out of the exit tunnel to the front, right and left, creating a fan-shaped or heart-shaped mound (Fig. 3). (See Table 1 for a comparison of pocket gopher and mole mounds.)

The capacity of pocket gophers to excavate tunnels is phenomenal and heavy clay soil doesn't deter them. Gophers may create several mounds per day, especially during the seasons when the soil is moist and easy to dig. In irrigated areas such as lawns, gardens, and pastures, digging conditions may be optimal year-round, and mounds can appear at any time.

Differences between moles and pocket gophers. Before setting out to control what you assume to be gopher damage, be sure to properly identify the animal causing the damage.	
Moles	Pocket Gophers
Minute eyes are often not visible.	Small eyes are clearly visible.
Muzzle is long and tapering.	Muzzle is rounded.

Attachment to James Goche's comment

The many small teeth are not apparent.	Orange, chisel-like pairs of upper and lower incisors are apparent.
Mounds are round when viewed from above.	Mounds are crescent- or heart-shaped when viewed from above.
Soil plug is in the middle of mound and may not be distinct.	Soil plug is in the middle of the V shape or off to the side of the mound and may leave a visible depression.
Tunnels are often just beneath the surface, leaving a raised ridge.	No tunnels are visible from above ground.

Tunnels

Pocket gopher tunnels are 1¾ to 3½ inches in diameter, depending on the size of the gopher digging the tunnel. Tunnels occur 4 to 12 inches below ground, whereas the nest and food storage chamber may be as deep as 6 feet. Tunnels tend to be deeper in drier soils. Short, sloping, lateral tunnels connect the main tunnel system to the surface and are created for pushing dirt to the surface and access to foraging on the surface (Fig. 3).

Soil Plugs

Tunnel exits made by a pocket gopher are marked by a 1- to 3 inch circle of disturbed soil, or a circular depression, called a “soil plug.” Soil plugs occur where a gopher emerged to forage or deposit soil, and then plugged up the hole on reentry. Plugs are found at mounds or along the course of the burrow system. Vegetation may be clipped around the soil plugs where a gopher was foraging.

Winter Soil Casts

Soil casts are created because pocket gophers commonly backfill their previously excavated tunnels with excess soil when they dig new tunnels. Casts are the result of this excess soil being backfilled into snow tunnels. When the snow melts, these then become apparent. Castings are nearly always fragmented and in short sections. Only a fraction of snow tunnels are backfilled with soil, so castings represent only a fraction of the gopher’s winter work.

Preventing Conflicts

The ecological services of pocket gophers, which are substantial, are often not appreciated, particularly when the animals make their presence known by eating garden crops or damaging orchard or ornamental trees.

For homeowners and gardeners, gophers may be only an occasional (or seasonal) nuisance in lawns and garden beds, and not a long-term problem or threat. Where these animals are not so numerous as to be causing heavy damage, they should be considered neutral.

Attachment to James Goche's comment

The subspecies Brush Prairie pocket gopher and the Mazama (Western) pocket gopher are in decline and are, or soon will be, of conservation concern (see “[Legal Status](#)” and “[Mazama Pocket Gopher Conservation](#)”). The presence of one of these species in an area where you plan to take action—chemical, nonchemical, mechanical, or otherwise—could preclude use of this action. Before moving forward with any type of control, contact your local [Fish and Wildlife office](#).

The following are suggestions for reducing conflicts. In cases where these methods are not practical, contact your local County Extension Agent or local [Fish and Wildlife office](#) for further information.

Frightening devices and repellents: Although many devices are commercially available for use to frighten pocket gophers (vibrating stakes, ultrasonic devices, pinwheels, etc.), gophers do not frighten easily. This is probably because of their repeated exposure to noise and vibrations from sprinklers, people and livestock moving about, and lawnmowers and other power equipment.

Note: Be skeptical of commercial products and claims, and make sure the manufacturer offers a money-back guarantee if the product proves ineffective.

No repellents currently available will reliably protect lawns or other plantings from pocket gophers. Mothballs, garlic, spearmint leaves, predator urine placed in tunnels—and a perimeter of mole plant or castor bean planted around gardens—have all provided mixed results. Such control strategies may be experimented with where gophers are an occasional problem, but not a long-term threat.

Barriers: Constructing a barrier to keep pocket gophers from tunneling into an area can be labor-intensive and costly; however, this approach is recommended for small areas and areas containing valuable plants. Flowerbeds and nursery beds can be protected by complete underground screening of the sides and bottom. Raised beds with rock or wooden side supports will only require bottom protection (Fig. 4).

Wire baskets can be used to protect the roots of individual trees and shrubs. These can be purchased from nurseries or farm supply centers, or be homemade. Use a double layer of light-gauge wire, such as 1-inch mesh chicken wire for trees and shrubs that will need protection only while young. Leave enough room to allow for a few years of root development before the wire rots away.

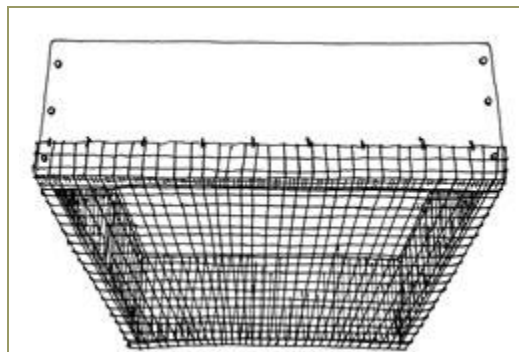


Figure 4. Raised beds can be protected from gopher damage by screening the bottom side with ½-inch mesh hardware cloth. (Drawing by Jenifer Rees.)

Groups of bulbs (gophers are reported not to eat daffodil bulbs) and other plants needing long-term protection can be placed in baskets made from ½-inch mesh hardware cloth, available from hardware stores and building supply centers.

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Large areas, such as vegetable gardens, can be protected using an underground gopher fence (Fig. 5) or a stone-filled trench. However, such a below-ground barrier will only slow the movements of gophers for a time; sooner or later the barrier will be breached since gophers are capable of digging much deeper than 24 inches.

To add to the life of underground barriers, spray on two coats of rustproof paint before installation. Above-ground parts can also be painted to blend in. Always check for utility lines before digging in an area.

Several types of barriers (plastic tubes, one gallon plant containers) are effective at protecting aboveground parts of small plants, such as newly planted conifers.

Gophers may be deterred from chewing underground sprinkler lines or utility cables by surrounding them with 6 to 8 inches of coarse gravel 1 inch or more in diameter.

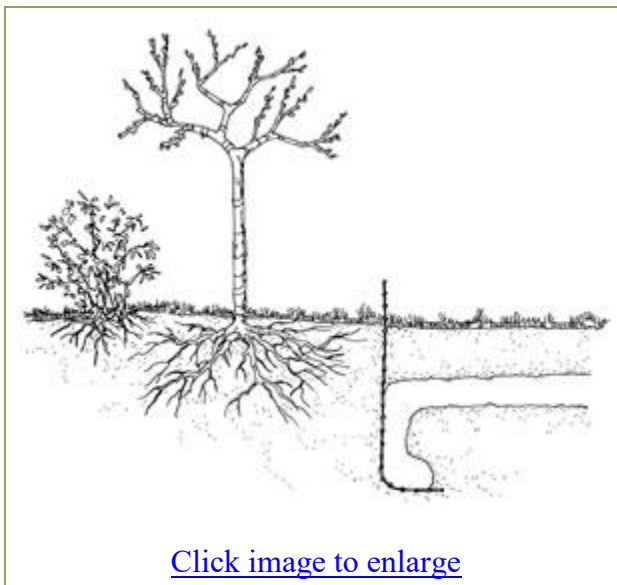
In situations where gophers are gnawing on water lines or wires, or are burrowing into dams and dikes, refer to [Muskrats](#) for management recommendations.)

Flooding: Pocket gophers can easily withstand normal garden or home landscape irrigation, but flooding can sometimes be used to force them from their burrows. The entire tunnel system will need to be quickly and completely flooded to evict its tenants. Five-gallon buckets of water poured in the hole will flood the area more quickly than a running hose.

Flooding has the greatest chance of succeeding if gophers are invading the property for the first time. Where they are already well established, their systems are too extensive.

For humane reasons, concentrate this effort in late winter and early spring, before gophers give birth. Be careful when attempting to flood out a gopher near a building; doing so could damage the foundation or flood the basement or crawl space.

Natural control: A long-term way to help prevent conflicts is a combination of natural and active control. Predators—including snakes, dogs, coyotes, long-tailed weasels, and skunks—kill gophers. In addition, attracting barn owls and other raptors, which prey on young gophers when



[Click image to enlarge](#)

Figure 5. A pocket gopher fence should be installed at least 24 inches below ground (or down to the hardpan or bedrock) and 6 inches above ground. Use a 36-inch wide roll of ½-inch mesh hardware cloth. Before placing the hardware cloth perpendicularly in the trench, the bottom 6 inches should be bent outward at a 90-degree angle. Alternatively, fill a 10-inch wide by 24-inch deep trench with gravel that is 1 inch or more in diameter. **Note:** Such barriers will likely only work temporarily. (Drawing by Jenifer Rees.)

Attachment to James Goche's comment

they disperse, may help control a gopher population, particularly in rural areas. Encouraging these species, or not discouraging them, may help control the gopher population.

Predators alone won't keep a gopher population below the levels that cause problems in gardens and landscaped areas. Before removing every gopher, they will move on to hunt at more profitable locations. However, when combined with the other control techniques described here, natural control can contribute to overall control.

Public Health Concerns

Gophers are not considered to be a significant source of any infectious disease transmittable to humans or domestic animals.

Legal Status

The **Mazama (Western) pocket gopher** (*Thomomys mazama*) of Thurston, Pierce, Clallam, and Mason Counties is a state threatened and federal candidate species. *Because only remnant populations of these subspecies and species exist, people should not use lethal control in these areas.*

Elsewhere, pocket gophers are unclassified and may be trapped or killed and no special trapping permit is necessary for the use of live traps. However, a special trapping permit is required for the use of all traps other than live traps ([RCW 77.15.192](#), [77.15.194](#); [WAC 232-12-142](#)). There are no exceptions for emergencies and no provisions for verbal approval. All special trapping permit applications must be in writing on a form available from the Department of Fish and Wildlife .

It is unlawful to release a pocket gopher anywhere within the state, other than on the property where it was legally trapped, without a permit to do so ([RCW 77.15.250](#); [WAC 232-12-271](#)).

Because legal status, trapping restrictions, and other information about gophers change, contact your local [Fish and Wildlife office](#) for updates.

Mazama Pocket Gopher Conservation

In the south Puget Sound area, many populations of Mazama pocket gopher have disappeared since the 1940s, and the species was recently listed as a candidate for protection under the federal Endangered Species Act.

Mazama pocket gophers continue to decline in numbers in part because of their small, local breeding populations. For many years the species has persisted by continually recolonizing areas after local extinctions have occurred; however, loss of habitat to development, trapping by homeowners, and persecution by domestic cats and dogs have probably stopped much of this recolonization.

While large populations of some pocket gopher species can recover, the small and

Attachment to James Goche's comment

isolated populations of the Mazama pocket gopher can be completely lost.

If Mazama pocket gophers are to persist in the south Puget Sound area, they will require protection and lands where management is compatible with their needs. In addition, because Mazama gophers occupy grassy areas near homes and private property, a heightened level of tolerance will be required from those people who share their territories. In addition, if gophers are to survive in the suburbs, it may only be because homeowners are willing to keep their cats indoors.

Additional Information

Books

Hygnstrom, Scott E., et al. *Prevention and Control of Wildlife Damage*. Lincoln, NE: University of Nebraska-Lincoln, Institute of Agriculture and Natural Resources, 1994. (Available from: University of Nebraska Cooperative Extension, 202 Natural Resources Hall, Lincoln, NE 68583-0819; phone: 402-472-2188; also see Internet Site below.)

Maser, Chris. *Mammals of the Pacific Northwest: From the Coast to the High Cascades*. Corvallis: Oregon State University Press, 1998.

Verts, B. J., and Leslie N. Carraway. *Land Mammals of Oregon*. Los Angeles: University of California Press, 1998.

Internet Resources

[Burke Museum's Mammals of Washington](#)

[Internet IPM Resources on Vertebrate Pests](#) (Oregon State University)

[Prevention and Control of Wildlife Damage](#)



APPENDIX 3



<http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7433.html>

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Adult pocket gopher, *Thomomys* species

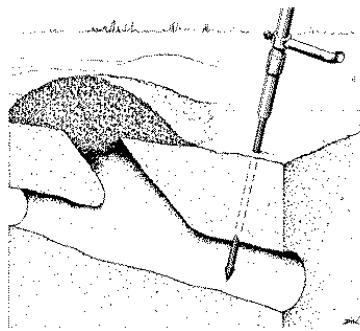
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Top view of a pocket gopher mound.



Top view of a mole mound.



A gopher probe.



Types and brands of gopher traps include (clockwise from upper right) Victor Black Box, Macabee, Gophinator, and Cinch.

Pocket gophers, often called gophers, *Thomomys* species, are burrowing rodents that get their name from the fur-lined, external

Attachment to James Goche's comment

cheek pouches, or pockets, they use for carrying food and nesting materials. Pocket gophers are well equipped for a digging, tunneling lifestyle with their powerfully built forequarters; large-clawed front paws; fine, short fur that doesn't cake in wet soils; small eyes and ears; and highly sensitive facial whiskers that assist with moving about in the dark. A gopher's lips also are unusually adapted for their lifestyle; they can close them behind their four large incisor teeth to keep dirt out of their mouths when using their teeth for digging.

IDENTIFICATION

Five species of pocket gophers are found in California, with Botta's pocket gopher, *T. bottae*, being most widespread. Depending on the species, they are 6 to 10 inches long. For the most part, gophers remain underground in their burrow system, although you'll sometimes see them feeding at the edge of an open burrow, pushing dirt out of a burrow, or moving to a new area.

Mounds of fresh soil are the best sign of a gopher's presence. Gophers form mounds as they dig tunnels and push the loose dirt to the surface. Typically mounds are crescent or horseshoe shaped when viewed from above. The hole, which is off to one side of the mound, usually is plugged. Mole mounds are sometimes mistaken for gopher mounds. Mole mounds, however, are more circular and have a plug in the middle that might not be distinct; in profile they are volcano-shaped. Unlike gophers, moles commonly burrow just beneath the surface, leaving a raised ridge to mark their path.

One gopher can create several mounds in a day. In nonirrigated areas, mound building is most pronounced during spring or fall when the soil is moist and easy to dig. In irrigated areas such as lawns, flower beds, and gardens, digging conditions usually are optimal year round, and mounds can appear at any time. In snowy regions, gophers create burrows in the snow, resulting in long, earthen cores on the surface when the snow melts.

BIOLOGY AND BEHAVIOR

Pocket gophers live in a burrow system that can cover an area that is 200 to 2,000 square feet. The burrows are about 2 1/2 to 3 1/2 inches in diameter. Feeding burrows usually are 6 to 12 inches below ground, and the nest and food storage chamber can be as deep as 6 feet. Gophers seal the openings to the burrow system with earthen plugs. Short, sloping lateral tunnels connect the main burrow system to the surface; gophers create these while pushing

Attachment to James Goche's comment

dirt to the surface to construct the main tunnel.

Gophers don't hibernate and are active year-round, although you might not see any fresh mounding. They also can be active at all hours of the day.

Gophers usually live alone within their burrow system, except when females are caring for their young or during breeding season.

Gopher densities can be as high as 60 or more per acre in irrigated alfalfa fields or in vineyards. Gophers reach sexual maturity about 1 year of age and can live up to 3 years. In nonirrigated areas, breeding usually occurs in late winter and early spring, resulting in 1 litter per year; in irrigated sites, gophers can produce up to 3 litters per year. Litters usually average 5 to 6 young.

Pocket gophers are herbivorous and feed on a wide variety of vegetation but generally prefer herbaceous plants, shrubs, and trees. Gophers use their sense of smell to locate food. Most commonly they feed on roots and fleshy portions of plants they encounter while digging. However, they sometimes feed aboveground, venturing only a body length or so from their tunnel opening. Burrow openings used in this manner are called "[feed holes](#)." You can identify them by the absence of a dirt mound and by a circular band of clipped vegetation around the hole. Gophers also will pull entire plants into their tunnel from below. In snow-covered regions, gophers can feed on bark several feet up a tree by burrowing through the snow.

DAMAGE

Pocket gophers often invade yards and gardens, feeding on many garden crops, ornamental plants, vines, shrubs, and trees. A single gopher moving down a garden row can inflict considerable damage in a very short time. Gophers also gnaw and damage plastic water lines and lawn sprinkler systems. Their tunnels can divert and carry off irrigation water, which leads to soil erosion. Mounds on lawns interfere with mowing equipment and ruin the aesthetics of well-kept turfgrass.

LEGAL STATUS

The [California](#) Fish and Game Code classifies pocket gophers as nongame mammals. This means if you are the owner or tenant of the premises and you find pocket gophers that are injuring growing crops or other property, including garden and landscape plants, you can control them at any time and in any legal manner.

Attachment to James Goche's comment

MANAGEMENT

To successfully control gophers, the sooner you detect their presence and take control measures the better. Most people control gophers in lawns, gardens, or small orchards by trapping and/or by using poison baits.

Probing for Burrows

Successful trapping or baiting depends on accurately locating the gopher's main burrow. To locate the burrow, you need to use a gopher probe. Probes are commercially available, or you can construct one from a pipe and metal rod. Probes made from dowels or sticks work in soft soil but are difficult to use in hard or dry soils. An enlarged tip that is wider than the shaft of the probe is an important design feature that increases the ease of locating burrows.

To find burrows, first locate areas of recent gopher activity based on fresh mounds of dark, moist soil. Fresh mounds that are visible aboveground are the plugged openings of lateral tunnels. You can find the main burrow by probing about 8 to 12 inches from the plug side of the mound; it usually is located 6 to 12 inches deep. When the probe penetrates the gopher's burrow, there will be a sudden, noticeable drop of about 2 inches. You might have to probe repeatedly to locate the gopher's main burrow, but your skill will improve with experience. Because the gopher might not revisit lateral tunnels, trapping and baiting them is not as successful as in the main burrow.

Trapping

How to set a Macabee trap (Requires Flash player)

Trapping is a safe and effective method for controlling pocket gophers. Several types and brands of gopher traps are available. The most common type is a two-pronged, pincher trap such as the [Macabee](#), Cinch, or Gophinator, which the gopher triggers when it pushes against a flat, vertical pan. Another popular type is the choker-style box trap.

To set traps, locate the main tunnel with a probe, as described above. Use a shovel or garden trowel to open the tunnel wide enough to set traps in pairs [facing opposite directions](#). Placing traps with their openings facing in opposite directions means you will be able to intercept a gopher coming from either end of the burrow. The box trap is easier to use if you've never set gopher traps before,

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but setting it requires more surface excavation than if you are using the pincer-type traps, an important consideration in lawns and some gardens. However, box traps can be especially useful when the diameter of the gopher's main tunnel is smaller than 3 inches, because in order to use the pincer-type traps, you will need to enlarge small tunnels to accommodate them. This can add time to the trapping process.

It isn't necessary to bait a gopher trap, although some claim baiting might give better results. You can use lettuce, carrots, apples, alfalfa greens, or peanut butter as bait. Place the bait at the back of a box trap behind the wire trigger or behind the flat pan of a pincer-type trap. Wire your traps to stakes so you can easily retrieve them from the burrow.

Where to place Macabee traps (Requires Flash player)

After setting the traps, you can exclude light from the burrow by covering the opening with dirt clods, sod, canvas or landscape cloth, cardboard, or plywood. You can sift fine soil around the edges of these covers to ensure a light-tight seal. Alternatively, you can leave the trap-sets uncovered, thereby encouraging gophers to visit these trap sites as they seek out these openings to plug; gophers do not like open systems.

The influence on capture success of covering versus uncovering trap-sets is unclear, although current data suggests there might be little difference. Leaving trap-sets uncovered will allow you to set traps more quickly and check them more easily. However, you always should cover sets when using box traps, since gophers likely will plug tunnels before hitting the trigger wire of these traps if you leave them uncovered.

Check traps often and reset when necessary. If you haven't captured a gopher within 2 days, reset the traps in a different location.

Baiting with Toxic Baits

The key to an effective toxic baiting program is bait placement. Always place pocket gopher bait in the main underground tunnel, not the lateral tunnels. After locating the main gopher tunnel with a probe, enlarge the opening by rotating the probe or inserting a larger rod or stick. Following label directions, place the bait carefully in the opening using a spoon or other suitable implement that you use only for that purpose, taking care not to spill any onto the ground. A funnel is useful for preventing spillage.

Attachment to James Goche's comment

Often, a back-filled (plugged) tunnel—one a gopher has filled with loose dirt—will feel similar to an active tunnel. Experience is required to tell the difference. New probe users might benefit from digging down to confirm that the tunnel is active or plugged. If it is an active tunnel, you can apply bait to both of the tunnel's sides before closing it up. If it is plugged, don't treat. Once you are comfortable with your ability to accurately determine active tunnels, you can follow the standard baiting protocols described below.

Strychnine-treated grain is the most common type of bait used for pocket gopher control. This bait generally contains 0.5% strychnine and is lethal with a single feeding. Baits containing 2.0% zinc phosphide are also available. As with strychnine, these baits are lethal after a single feeding.

Multiple feeding anticoagulants are available as well. When using anticoagulant baits, you'll need to set out a large amount of bait—about 10 times the amount needed when using strychnine baits—so enough will be available for multiple feedings. Although generally less effective than strychnine baits, anticoagulant baits are less toxic. As such, they are preferred in areas where children and pets might be present. When using either type of bait, be sure to follow all label directions and precautions.

After placing the bait in the main tunnel, close the probe hole with sod, rocks, or some other material that excludes light while preventing dirt from falling on the bait. Several bait placements within a burrow system will increase success. Tamp down or clear existing mounds, so you can distinguish new activity. If new mounds appear more than 2 days after strychnine or zinc phosphide baiting or 7 to 10 days after using anticoagulant baits, you'll need to rebait or try trapping.

If gophers have infested a large area, use a [hand-held bait applicator](#) to speed treatment. Bait applicators are a combination probe and bait reservoir. Once you have located a tunnel using the probe, a trigger releases a measured amount of bait into the tunnel. Generally, strychnine bait is used with such an applicator, because it dispenses only a small quantity of bait at a time.

Fumigation

Fumigation with smoke or gas cartridges usually isn't effective, because gophers quickly seal off their burrow when they detect smoke or gas. However, fumigation with aluminum phosphide is effective at controlling gopher populations, although it is a restricted-use material. Applicators must be certified to use this

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material, which can limit homeowner use. Fortunately, many professional pest control operators have access to aluminum phosphide, so if trapping and baiting aren't effective, consider hiring a professional.

Exclusion

Underground fencing might be justified for valuable ornamental shrubs or landscape trees. To protect existing plantings, bury hardware cloth or 3/4-inch mesh poultry wire at least 2 feet deep with an additional 6 inches of mesh or wire bent at a 90-degree angle away from the planting. This will help keep gophers from digging around the fencing boundary. Also extend the fencing at least 1 foot aboveground to deter gophers moving overland. This method is not perfect, however, because persistent gophers can burrow below the wire; also, the wire can restrict and damage root growth of trees.

You can protect small areas such as flower beds by complete underground screening of the bed's sides and bottoms. When constructing raised vegetable or flower beds, underlay the soil with wire to exclude gophers. To protect individual plants, install wire baskets, which you can make at home or buy commercially, at the same time you are putting the plants into the ground. If you use wire, use one that is light gauge and only for shrubs and trees that will need protection while young. Leave enough room to allow for the roots to grow. Galvanized wire provides the longest-lasting protection.

Six to 8 inches of coarse gravel 1 inch or more in diameter around underground sprinkler lines or utility cables also can deter gophers.

Natural Controls

Because no population will increase indefinitely, one alternative to a gopher problem is to do nothing, letting the population limit itself. Experience has shown, however, that by the time gopher populations level off naturally, they've already caused much damage around homes and gardens.

Predators—including owls, snakes, cats, dogs, and coyotes—eat pocket gophers. Predators rarely remove every prey animal but instead move on to hunt at more profitable locations. In addition, gophers have defenses against predators. For example, they can escape snakes in their burrows by rapidly pushing up an earthen plug to block the snake's advance. Relying solely on natural predators might not control gophers to the desired level.

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Some people have tried attracting barn owls to an area by installing nest boxes. Although barn owls prey on gophers, their habit of hunting over large areas, often far from their nest boxes, and their tendency to hunt areas with abundant prey, make them unreliable for gopher control. When a single gopher, which is capable of causing damage rapidly, invades a yard or garden, a gardener can't afford to wait for an owl to arrive. It is better to immediately take effective action, usually through trapping or baiting.

Habitat Modification

Reducing gopher food sources using either chemical or mechanical methods can decrease the attractiveness of lawns and gardens to gophers. If feasible, remove weedy areas adjacent to yards and gardens to create a buffer strip of unsuitable habitat.

Other Control Methods

Pocket gophers easily can withstand normal garden or home landscape irrigation, but you sometimes can use flooding to force them from their burrows, which will enable you to use a shovel or a dog to destroy the rodent.

Gas explosive devices also are available and are somewhat effective at controlling gopher populations. These devices ignite a mixture of propane and oxygen in the burrow system. This concussive force kills the gopher and destroys the burrow system. Be sure to exercise caution when using these devices because of the potential for unintended damage to property, injury to users and bystanders, potential for starting fires in dry environments, and destruction of turf. Additionally, these devices can be quite loud, making them unsuitable in residential areas.

No repellents currently are available for successfully protecting gardens or other plantings from pocket gophers. Plants such as gopher purge (*Euphorbia lathyris*), castor bean (*Ricinus communis*), and garlic have been suggested as repellents, but research has not substantiated these claims.

Although many devices designed to frighten pocket gophers are commercially available—including vibrating stakes, ultrasonic devices, and wind-powered pinwheels—these rodents don't frighten easily, probably because of their repeated exposure to noise and vibrations from sprinklers, lawnmowers, vehicles, and people moving about. Another ineffective control method is placing chewing gum or laxatives in burrows in hopes of killing gophers.

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Follow-up

Once you have controlled pocket gophers, monitor the area on a regular basis for reinfestation. Level all existing mounds after the control program, and clean away weeds and garden debris, so you easily can see fresh mounds.

It is important to check regularly for reinfestation, because pocket gophers can move in from other areas, and damage can reoccur in a short time. If your property borders wildlands, vacant lots, or other areas that serve as a source of gophers, you can expect gophers to reinvade regularly.

Be prepared to take immediate control action when they do. It is easier, cheaper, and less time consuming to control one or two gophers than to wait until the population builds up to the point where they cause excessive damage.

[HEALTH AND ENVIRONMENTAL IMPACTS OF MANAGEMENT ALTERNATIVES](#) (from California Department of Pesticide Regulation)

[WARNING ON THE USE OF CHEMICALS](#)

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Pest Notes: Pocket Gophers

UC ANR Publication 7433

[Download PDF](#)

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http://gophergoner.com/faq_gophers_and_moles.shtml#faq_09

Voles, also known as field mice, are common pests in lawns and gardens and can easily be confused with a gopher because of the obvious damage to plants. The key to identifying a vole is by the multiple open tunnels that are about the diameter of a golf ball. The area around the opening is very clean and polished. There will also be evidence on the surface of beaten down pathways through the grass. **Voles do not have the proper teeth and claws to excavate tunnels, so they generally will use abandoned mole and gopher tunnels to establish their colonies. Voles can create as much damage as a gopher. Voles will gradually strip the bark from the base of shrubs and trees and eat roots, bulbs, tubers and seeds.**

You can read more about Voles at the [UC Davis website](#).

How do I know if I have a gopher?

Gophers are often mistaken for moles. However, the surface evidence is quite different and not difficult to identify if you take the time to learn to identify gopher vs. mole activity. A gopher does not dig surface tunnels like a mole, and the gopher mound is shaped differently. If you look down on a gopher mound, you will see a distinct crescent or horseshoe shape with a plug of dirt at the top of the crescent or horseshoe. You should also see other mounds close by. If you don't see fresh mounds, look closely for freshly plugged holes 2-3 inches in diameter. These plugged holes can be difficult to spot, but may be your only opportunity to set a trap. The 2-3 inch plugged holes are referred to as "feedholes" because the gopher is not excavating at these places. It is digging to the surface to eat above ground, feeding close to the safety of its tunnel. Gophers always plug their tunnels and feedholes. If the tunnel is open, it is abandoned or possibly there is a vole living in the tunnel.

As we mentioned in several answers, a gopher is strictly an herbivore. **Gophers will eat just about any plant.** The crescent shaped mound and dead and wilted plants are a good indication that a gopher is your culprit. **A gopher locates plants and roots in three ways; 1) the gopher can clip the roots off below the surface where the damage is not quickly noticeable, or it might clip the base of a plant to just above the surface as it excavates tunnels, 2) the gopher can pull plants growing above the ground into its tunnel from below, or 3) the gopher will surface above-ground, venturing a short distance from their hole to snag plants near the opening.** As mentioned before, these openings are known as feedholes and vary in diameter from 2-3 inches depending on the size of the gopher.

Learning to spot fresh feedholes is an essential part of trapping. Understanding gopher eating habits will help identify your pest so you can use the correct size trap, trapping techniques and understand where to set traps.

Once a gopher establishes its territory, it will fight to protect that territory. **A 4-5 year old adult male gopher can control up to 2,000 square feet.** With close observation, you can identify one

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gopher system by following the fresh mounds.

It is important to note that on rare occasion, we have trapped a mole in a gopher tunnel system. It is rare, but if you trap a gopher and continue to see fresh activity, it may be necessary to change from the medium trap to the small trap to capture the mole. If the tunnel is sealed when you return a day or two later, and you continue to set the medium trap only to find the trap sprung, the solution might be to switch to the smaller trap. Finally, since both moles and gophers control large areas, the activity must be fresh. Both moles and gophers seal off unused tunnels. It is a waste of time to set a trap in a mole mound, a surface tunnel or a gopher mound or feedhole that is old.

You can learn more about gophers by visiting:

Read [Managing Pocket Gophers](#) by W.F. Andelt, Colorado State University Cooperative Extension wildlife specialist and associate professor, fishery and wildlife biology; and R.M. Case, forestry, fisheries and wildlife, University of Nebraska. **Also read [GOPHER Control and Management Information](#)** at the Internet Center for Wildlife Damage Management in cooperation with Cornell University, Clemson University, Purdue University, University of Nebraska, and Utah State University.

What do gophers eat?

As we have mentioned in several answers, gophers are strict herbivores. People say that gophers are all mouth and no heart because they eat such a wide variety of plants. Their diet shifts seasonally according to the availability of food and the gopher's needs for nutrition and water. For example, cactus plants loaded with water may become a major part of their diet during the hot and dry summer months in arid habitats. Plains gophers consume grasses, especially those with rhizomes, but they seem to prefer fleshy plants when they are succulent in spring and summer.

Gophers eat above ground parts of vegetation mainly during the growing season, when the vegetation is green and succulent. The height and density of vegetation may also offer protection from predators, reducing the risk of short surface trips. Year-round, however, roots are the major food source. Many trees and shrubs are clipped just above ground level. This occurs mainly during winter under snow cover. Damage may reach as high as 10 feet above ground. Seedlings and grapevines also have their roots clipped by gophers. Gophers exist from low coastal areas to elevations above 12,000 feet. Gophers are found in a wide variety of soil types and conditions. They reach their greatest population densities in light-textured soils with rich leafy plants such as alfalfa, especially when the vegetation has large, fleshy roots, such as grape vines, roses, bulbs, and tubers.

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I've heard that moles and gophers are antisocial. Is that true and how does that effect trapping?

Researchers describe moles and gophers as solitary and territorial animals. Solitary literally means that they live alone. You may think you have many moles or gophers in your property because of the extensive mounds both a mole and a gopher can create, but you probably only have one mole if you own a residential property and maybe 2 or 3 gophers if your residential property has never been trapped. Territorial means that both a mole and a gopher will NOT share their tunnel system with another animal of the same. Again, the number of mounds will cause you to believe that you have a "family." However, gophers do not live in families, and while moles can share the same tunnel system during mating season, that is the only time a mole will share its burrow with another of the same. After mole and gopher pups are weaned, the male and female separate and are not social under any circumstances! It is important to know that a mole mates only once a year. Gophers will generally mate 2-3 times a year. However, in areas that support more dense populations, gophers can mate year round.

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Gophers are extremely aggressive. Never try to pick up a live gopher! An adult gopher is extremely territorial and will rigorously defend its territory against intruders. When one gopher meets another, they squeal and hiss at one another, and clack their teeth. They fight violently until one retreats, or until one or both are dead. A gopher is more territorial than a mole and will kill to defend its territory. A male gopher will kill the female he has recently mated and later, her pups should they enter his territory. But don't make negative assumptions about adult males. The juveniles and females are just as vicious. A female will kill her pups after she has expelled them from her tunneling system. Once the pups are expelled, they must travel overland and seek their own territory. The life of a gopher is not easy.

That being said, wild animals are never 100% predictable. On very rare occasions, we have trapped one gopher and a day later, returned to find the same tunnel plugged again. When this happens, we opened the tunnel, set a trap, and upon return to check the trap, have found a second mole or gopher caught in the trap. We have read research that a mole and a gopher can share common causeways without confrontation, but cannot explain how a second gopher can find the trap a day or two later. We only mention this to encourage you exhaust every trapping opportunity. Continue to set traps at any tunnel that you trapped and upon return, found plugged.

Researchers report that a gopher runs its main tunnel, including all the fresh lateral tunnels leading to the main tunnel every 24-hours. Unfortunately, moles are not so predictable. However, if you open the main tunnel of a mole, usually under a freshly excavated mound, the air and light will bring the mole to the surface to check and make repairs. Our GopherGoner™ trapping system takes advantage of the day to day habits of moles and gophers.

Read more about biology and behavior of gophers at the [Utah State University Cooperative Extension](#)

<http://www.pestnet.com/rodents/what-do-gophers-eat/>

What Do Gophers Eat

Gophers eat more than half their body weight in food—particularly plant matter—each day. Before attempting to control or remove gophers, it is important to answer the question, what do gophers eat? In short, these rodent pests tend to eat any and all types of plants—be it grasses, trees, shrubs, bulbs, roots, seeds, or tubers. Gophers also eat vegetables that grow beneath the surface. They particularly enjoy peas, carrots, and sweet potatoes. Gophers also feed on large vegetables like carrots, garlic, and onions. They may be less drawn to yams, beets, and potatoes. They have also been known to eat cabbage, broccoli, and brussel sprouts. Gophers also eat earthworms or small, soft-bodied insects. These un-picky animals will devour lettuce but have an aversion to rhubarb; therefore, it's a good idea for gardeners to plant their lettuce next to rhubarb.

Gophers may eat plants they see while looking for food—or a mate. The gopher typically gnaws the roots of a plant just beneath the soil, so the damage isn't seen. They may also claim plants by pulling them down into their home just below the surface. Once in a while gophers will make a full-body appearance above the surface to eat plants.

Knowing what gophers *won't* eat may be helpful in planting a garden that won't get devoured by gophers. While they will eat almost anything in their path *if* they're hungry enough, the gophers' least favorite foods include a variety of flowers and garlic. They also dislike peas and beans because the taste of these root systems has an unappealing taste to them. They also tend to shy away from grains such as oats and corn—their roots systems are too thick. Squashes rarely get touched by gophers, as do peppers, tomatillo, berries, and tomatoes. Gophers may, however, eat at the root system of a tomato if there is a shortage of food. Fruit trees are usually safe after three years. Watch out, though. The roots of a young tree are a special treat for gophers to eat!

http://allstateanimalcontrol.com/animals/gophers/gopher_faq.php

Q. Why do I need to get rid of gophers?

A. Gophers are so cute and there aren't really all that many of them, surely they can't be all that bad. Right! These little creatures are amazing diggers and tunnelers. All those dirt mounds you find in your yard are probably created by ONE gopher. Each gopher produces 10-30 mounds a month ranging in volume from a glass full to a gallon. When digging, they find stuff. If it is edible, they eat it. If not, they chew right through many things they encounter underground. This includes phone or other utility lines and irrigation lines. Small rocks they carry out and add to the dirt pile (Hope you don't hit one with the mower). If large rocks or other un-chewable objects get in the way, they just dig around them.

Gophers aggressively consume tree roots, even to the point the tree is no longer supported and falls over-landing where it may.

Weasels, skunks, snakes and other animals prey on gophers and frequent the same areas, causing their own special forms of damage in the process.

Q. When are gophers a problem?

A. Gophers are a problem when they occupy expensive landscaped or cultivated areas-lawns, fields or golf courses. Gophers seek roots, and destroy the plants or trees in the process. As they move about underground, they throw up mounds of dirt that are very unattractive. Their tunnels create holes and other weak spots in the ground that can twist or even break ankles and legs of humans and large animals, such as horses.

Gophers give dogs and foxes a seemingly irresistible urge to dig. Your dog, or the neighbor's dog, will add to your landscaping damage as they dig furiously, and usually futilely, after that sneaky little gopher.

Q. When is the best time to get rid of gophers?

A. As soon as you notice gopher activity-fresh fan-shaped mounds of fine dirt-it is time to get rid of them. The damage adds up quickly and they will not leave on their own. Get them out quickly before they have young and your cost multiplies along with the number of gophers.

Q. Where do gophers live?

A. Gophers, also called pocket gophers, are found in much of the Western Hemisphere. They are nature's rototiller, and environmentally significant. They live underground in open areas with grass or other cover and soil that is easy-to-dig. For example, if a soil is more than about 10% rock, it is highly unlikely that a gopher will live there because it is too hard to dig and tunnel.

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Gophers are highly territorial and rarely appear in a concentration greater than one gopher per quarter acre. That may not sound too bad, but in this case it isn't the quantity of problem, it's the quality of problem. That one little gopher can do a staggering amount of damage. Expect to find between 10 and 30 new mounds of dirt in your yard each month, as the gopher forages his way through your expensive and tasty plants.

Health & Safety

Q. What are the health risks of having gophers on my property?

A. Gophers are known carriers of rabies and monkeypox, a virus that attacks lymph nodes. Be particularly careful if the animal is out of its burrow and does not show fear. Given the shy, reclusive nature of gophers, this is a big clue the animal may be sick.

Gophers are commonly infested with lice, fleas, ticks and mites, as is common with all rodents. Domestic pets often encounter gophers. They might dig one up, or catch an unwary one making a rare trip above ground. Now your dog or cat has fleas and will bring them inside. These parasites like people almost as well as they like gophers.

A less commonly recognized health risk is injury from stepping into holes, tunnels or voids created by their digging and tunneling habits. Twisted or sprained ankles and even broken legs are common. Be particularly careful riding a horse in gopher country as both horse and rider can be injured or even killed.

Q. Will the gophers attack me?

A. Gophers eat plants, not people, but any wild animal will defend itself if cornered or picked up. Gophers will most commonly try to dig themselves out of a problem rather than attack.

Appendix F

Distribution List



APPENDIX F. SEPA DISTRIBUTION LIST

The following parties have received a digital copy of the Draft EIS or were notified of its availability at www.ThurstonHCP.org:

Tribal Governments

- Squaxin Island Tribe
- Nisqually Indian Tribe
- Confederated Tribes of the Chehalis Reservation

Federal

- U.S. Fish and Wildlife Service
- U.S. Army Corps of Engineers
- U.S. Department of Agriculture, Natural Resources Conservation Service
- Joint Base Lewis-McChord

State of Washington

- Department of Ecology
- Department of Agriculture
- Department of Archaeology and Historic Preservation
- Department of Commerce
- Department of Corrections
- Department of Fish and Wildlife
- Department of Health
- Department of Natural Resources
- Park and Recreation Commission
- Department of Health and Social Services
- Department of Transportation

Regional and County Agencies

- Thurston County Public Works
- Thurston County Environmental Health
- Thurston Regional Planning Council
- Port of Olympia
- Olympic Region Clean Air Agency
- Intercity Transit
- Puget Sound Energy
- Puget Sound Partnership
- Thurston PUD

Cities

- Town of Bucoda
- Town of Rainier
- City of Tenino
- City of Yelm
- City of Lacey
- City of Tumwater
- City of Olympia

Schools

- Rochester School District
- North Thurston School District
- Tumwater School District
- Yelm School District
- Tenino School District

Additional notices were sent to the following groups via e-mail, as appropriate:

- Recipients of notifications from the Thurston County Planning Department
- Persons and organizations expressing interest in the Thurston County Habitat Conservation Plan

