



TECHNICAL MEMORANDUM

TO: Mark Conwell, Conwell Investments, LLC
FROM: Steven Quarterman
DATE: May 31, 2023
RE: Oak Habitat Management Plan
 Oak Springs Plat
 3146 Marvin Road SE
 Thurston County, Washington
 Project No. 1382001.030

INTRODUCTION

Landau Associates, Inc. (Landau) completed an Oak Habitat evaluation for Thurston County Parcel No. 11825240000 (3146 Marvin Road SE; subject property) as documented in the October 16, 2013 Oak Habitat Evaluation Technical Memorandum (2013 Evaluation; Landau 2013), as well as an impact summary and conceptual mitigation plan as documented in the January 26, 2015 Oak Tree Habitat Assessment Technical Memorandum (2015 Assessment; Landau 2015). The proposed Plat of Oak Springs (Project) by Conwell Investments, LLC (Applicant) proposes to create 88 single-family dwelling units on the approximately 20-acre subject property. At the request of Thurston County and the Applicant, Landau has prepared this Habitat Management Plan to consolidate the 2013 Evaluation and 2015 Assessment and to provide information necessary for compliance with Thurston County Code (TCC) Title 24. Critical Areas.

EXISTING CONDITIONS SUMMARY

Four Oregon white oak¹ habitat areas (Stands A, B, C, and D) were identified on the subject property as described in detail in the 2013 Evaluation (also refer to Attachment 1):

- A. Stand A is approximately 1.1 acres in size and consists of mixed Douglas firs, Oregon white oaks, Pacific madrones (*Arbutus menziesii*), and big leaf maples (*Acer macrophyllum*) with native shrub and herbaceous understory. Stand A was identified as “degraded oak woodland habitat”.
- B. Stand B is approximately 59.2 acres in size, 0.5 acre of which is located on the subject property and is dominated by Oregon white oaks. Stand B is considered a “high quality oak woodland habitat”.

¹ TCC Chapter 24.25.06 identifies Oregon white oak woodlands, stands, and individual trees as Important Habitats and Species under TCC Chapter 24.25 Fish and Wildlife Habitat Conservation Areas.

- C. Stand C is approximately 0.9 acre in size and consists of a single, large, multi-stem Oregon white oak, adjacent Douglas fir, and Scotch broom. Based on canopy and the stem diameters, this is the largest Oregon white oak tree observed on the subject property. Stand A was identified as "degraded oak woodland habitat".
- D. Stand D is approximately 14.3 acres and primarily contains Douglas firs with some scattered small Oregon white oaks with very tall, dense, native scrub-shrub understory. Stand D was determined to not meet the definition of "oak woodland" or "degraded habitat"; however, these trees are ecologically associated with the oak trees on the adjacent property to the south (identified as Stand B).

MITIGATION SEQUENCING

TCC Chapter 24.01.037 outlines a mitigation sequence applicable to all critical areas. Before impacting any critical areas, applicants shall demonstrate that the following actions have been taken; actions must be prioritized as follows:

- E. Avoiding the impact altogether by not taking a certain action or parts of an action;
- F. Minimizing impacts by limiting the degree or magnitude of the action and its implementation by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts;
- G. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- H. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action;
- I. Compensating for the impact by replacing, enhancing, or providing substitute resources or environments; and/or
- J. Monitoring the impact and taking appropriate corrective measures.

Avoidance

All oak trees within Stands B and C will be preserved and protected at the subject property. Impacts to portion of Stand A will also be avoided.

Minimization

Impacts are minimized by utilizing tree protection measures in accordance with TCC Chapter 24.25.070. In addition, there will be unavoidable impacts to trees within the degraded oak habitat of Stand A and vegetation within Stand D, which was determined to not meet the definition of "oak woodland" or "degraded habitat" but includes individual oak trees (see Unavoidable Impacts below).

To further minimize impacts to the project area, best management practices (BMPs) will be used to limit erosion and accidental spills during construction. These BMPs will include preparation of a temporary erosion and sediment control plan, a construction stormwater pollution prevention plan, and a spill prevention, control, and countermeasures plan.

Unavoidable Impacts

Under the current development plans, all vegetation within Stand D and (three) select oak trees located within residential lots at the edge of Stand A will be removed. These impacts will occur to meet the Project objective, which includes single-family residential development at a density of 4.45 units per acre. The current zoning of the subject property is Low Density, three to six dwelling units per acre, and single family residential is permitted use in accordance with TCC Chapter 24.25.080.

Mitigation Plan

To mitigate for the proposed oak tree removal, we are proposing onsite mitigation to improve the health and vigor (i.e., enhancement) of the oak trees within Stands A and C, reduce the oak mortality in Stand A, expand oak habitat adjacent to Stand A (i.e., Tract B Open Space), and provide a post-development habitat corridor (i.e., Tract C Open Space) between Stands A and B. The conceptual mitigation plan is shown in Attachment 1 and described below.

- Conduct oak release, removing trees with overtopping crowns, within Stand A in accordance with oak management practices (Harrington and Devine 2006). This will consist of removing Douglas fir and select big leaf maple stems from Stand A to release the oak trees from competition with the faster growing trees, which will allow the oak trees to develop a fuller crown. Oak release will also result in increased acorn crops for wildlife and an increase in oak seedlings. Additional wildlife habitat will be created in Stand A by girdling select Douglas firs to create snags and using limbs from felled trees to create brush piles. Mature stems of the remaining big leaf maple, which provide wildlife habitat such as nesting cavities, will be retained.
- Remove the Douglas fir suppressing the northern side of the large oak tree in Stand C. This will prevent additional crown die-back and allow the oak tree to develop a fuller crown.
- Create a 30-foot (ft) wildlife corridor across the property adjacent to Stand A. This will include removing the existing access road to the subject property and enhancing the roadway footprint with native vegetation.
- Remove the Scotch broom (which is listed as a Class B Noxious Weed by the Washington State Noxious Weed Control Board [NWCB] website 2015), which degrades oak habitat, from the subject property in and adjacent to Stands A and B and from Stand C. Remove English holly (*Ilex aquifolium*) (on the Washington State NWCB website 2023) from Stand A.
- Enhance herbaceous vegetation within Stands B and C by applying a native seed mix which will include native bunch grasses and wildflowers associated with oak prairies.
- Add oak habitat adjacent to Stand A (Tract B Open Space).

Planting Plan

The planting plan is designed to enhance habitat functions and to control the spread of invasive species. Native species have been selected that naturally occur on the subject property and/or region, and that will supplement the existing native species present on the site. The planting plan includes preserving native trees/shrubs to the extent practical within the enhancement area. Species have been chosen not

only for their ability to tolerate site-specific soil and moisture conditions, but also for their ability to provide wildlife forage, habitat, human and pet deterrence, and erosion control functions.

Species recommended for Stand B and C planting plan include the following:

Common Name	Scientific Name	Type
TREES		
Oregon white oak*	<i>Quercus garryana</i>	Container; 12 ft on center
GROUNDCOVERS		
California brome	<i>Bromus carinatus</i>	Seed or plug
Sicklekeel lupine	<i>Lupinus albaculus</i>	Seed or plug
Squirreltail	<i>Elymus elymoides</i>	Seed or plug
Blanketflower	<i>Gaillardia aristata</i>	Seed or plug
Spanish clover	<i>Lotus purshianus</i>	Seed or plug
Western fescue	<i>Festuca occidentalis</i>	Seed or plug
Prairie junegrass	<i>Koeleria macrantha</i>	Seed or plug
Elegant clarkia	<i>Clarkia unguiculata</i>	Seed or plug
Notes: *Oregon white oak to be installed along northern boundary of Stand B only; refer to Attachment 1. Planting density of trees recommended at 12 ft on center, and groundcovers (plug) at 4 ft on center. Seed mix (if used), species, and content subject to availability and approval by project biologist or Applicant representative.		

Species recommended for the oak habitat in Tract C Open Space and Tract B Open Space planting include the following:

Common Name	Scientific Name	Type
TREES		
Oregon white oak	<i>Quercus garryana</i>	Container; 12 ft on center
SHRUBS		

Ocean spray	<i>Holodiscus discolor</i>	Container; 6 ft on center
Snowberry	<i>Symphoricarpos albus</i>	Container; 6 ft on center
Indian plum	<i>Oemleria cerasiformis</i>	Container; 6 ft on center
Tall Oregon grape	<i>Mahonia aquifolium</i>	Container; 6 ft on center
GROUND COVER		
Bigleaf lupine	<i>Lupinus polyphyllus</i>	Seed or plug
Blue wildrye	<i>Elymus glaucus</i>	Seed or plug
Bearberry	<i>Arctostaphylos uva-ursi</i>	Seed or plug
Arrowleaf balsamroot	<i>Balsamorhiza sagittata</i>	Seed or plug
Spike bentgrass	<i>Agrostis exarata</i>	Seed or plug
Notes: Planting density of trees recommended at 12 ft on center, shrubs at 6 ft on center, and groundcovers (plugs) at 4 ft on center. Seed mix (if used), species, and content subject to availability and approval by project biologist or Applicant representative.		

The quantity/area of planting will be coordinated with the project landscaping. The layout of the plant community is designed to maximize interspersions of species and will include informal and irregular groupings of the species to resemble naturally occurring plant communities. Because of the complexity in site topography, existing soils, and the importance of retaining existing native vegetation and woody features (i.e., snags, stumps, etc.), a biologist, landscape architect, or forester will determine the actual layout of vegetation plantings.

Mitigation Goals, Objectives, and Performance Standards

Goals are broad statements that generally define the intent or purpose of the proposed mitigation. Objectives specify the direct actions necessary to achieve the stated goals. Performance standards are the measurable values of specific variables that ensure objectives have been met. They provide the basis for determining if mitigation is a success. Two main goals have been outlined for this effort:

- **Goal #1:** Promote existing oak tree growth by reducing competition from adjacent Douglas firs, big leaf maples, and invasive species.
 - **Objective A:** Eliminate competing tree species from existing oak habitat to remain following project implementation.
 - **Performance Standard 1A:** Species Diversity – at the end of each monitoring year, tree species present in each stand will be dominated by oak.

- **Objective B:** Decrease invasive species cover in each remaining Stand.
 - **Performance Standard 1B:** Invasive Species – total aerial cover of invasive species in each Stand will be 10 percent or less in each year of monitoring.
- **Goal #2:** Establish oak habitat in Tracts C and B (adjacent to Stand A) and along the northern boundary of Stand B.
 - **Objective A:** Increase native species diversity and increase the number of oak trees in each planting area.
 - **Performance Standard 2A:** Plant Survival – at the end of Year 1, there will be 100 percent survival of installed tree and shrub vegetation. There will be at least 80 percent survival of installed tree and shrub species in subsequent monitoring years. Appropriate volunteer species will be counted for each dead or missing plant.
 - **Performance Standard 2B:** Species Diversity – at the end of each monitoring year, at least five desirable native tree or shrub species will represent 10 percent or more aerial cover, and at least four native herbaceous species will be present in the emergent plant community.
 - **Performance Standard 2C:** Invasive Species – total aerial cover of invasive species will be 10 percent or less in each year of monitoring.

MONITORING, MAINTENANCE, AND CONTINGENCY PLAN

Monitoring and maintenance are important elements for the success of the restoration project. The proposed restoration will be monitored during and after completion of the initial construction work, as described below.

Monitoring Quality Control Oversight

Following earthwork, soil will be decompacted and a qualified applicant representative (biologist, landscape architect, or forester) will confirm appropriate soil decompaction and grades and confirm that soil conditions are appropriate for planting. If recommended, soil amendments may be needed prior to or in conjunction with planting. A qualified applicant representative will verify that plant materials are healthy and consist of the correct species and sizes as designated in the planting plan and that they are placed in the correct growing environments. The qualified applicant representative will also work with the landscape contractor to advise on proper planting techniques including the size and excavation of planting holes, addition of soil amendments, and placement of mulch. When plant installation is complete, the qualified applicant representative will conduct an inspection and provide detailed notes on any changes to the final planting plan. This “as-built” plan will serve as the baseline for monitoring, and the monitoring period will commence when Thurston County’s biologist approves the “as-built” plan. The final checklist will be used to document that specifications have been met.

It is recommended that a temporary watering system be installed to support new plantings in the first 2 to 3 years until the root systems become well established. Watering during the dry season (typically mid-May through mid-October) greatly increases plant survival and reduces the need for plant replacement. Agricultural drip irrigation systems can be efficient, effective, and cost-competitive compared to replacing plantings due to mortality and the potential need to extend the monitoring program for additional years.

If wildlife foraging by deer is a potential concern, measures may need to be taken to temporarily exclude or discourage these animals from foraging within the mitigation site. The applicant should consult with local residents to determine if wildlife foraging is a potential issue and if so, consult with their qualified representative to determine appropriate exclusion or deterrent methods to protect the mitigation areas from forage during the monitoring period.

Monitoring/Site Maintenance Program

The Applicant will monitor the success of the plantings in Years 1, 3, and 5, throughout a 5-year period, provided that the mitigation is meeting its performance standards. If the mitigation is not meeting performance standards in Years 1 and 3, additional monitoring may be required in the even years. If the mitigation is not meeting performance standards in Year 5, additional monitoring years may be added to the monitoring period.

Monitoring will occur twice a year and will include data collected from permanent data collection stations or transects and will assess conditions established within the mitigation area. Permanent photographic stations will be established and mapped within the mitigation area. These will be placed to provide a comprehensive visual documentation of the mitigation site as it changes over the monitoring period. The monitoring stations will be employed during the late spring and summer months (May through September) in order to conduct an annual vegetation evaluation that involves documentation of woody plant mortality, aerial coverage of shrub and herb layers, invasive species coverage, and any colonization by native species as required by the performance standards. The first monitoring event in each monitoring year will take place in early May to identify invasive species and other potential issues related to site performance that may need to be addressed during the growing season. The second monitoring event in each monitoring year will occur in late summer to include data collection for evaluation of performance standards and determine if plant mortality requires plant replacement in the fall.

Monitoring reports will be prepared once per year. These reports will document site conditions and evaluate the collected data to determine if performance standards are being met. If a performance standard is not met, the monitoring report will discuss the possible reasons and recommend appropriate contingency plans. Any corrective measures will be documented and submitted to the County in accordance with regulations and/or permit conditions.

The primary maintenance activities that may be required within the mitigation area are irrigation, removal of nuisance/invasive species, protection from foraging, and plant replacement. Invasive species and noxious weeds listed on the Washington State NWCB list (NWCB 2023) and occurring within the

project mitigation areas should be hand-weeded or controlled by other appropriate methods for the duration of the monitoring period. For noxious weeds such as scotch broom, removal in early spring before plants become established and go to seed is preferred. Plants installed for mitigation will be replaced, as needed.

Contingency Plan

A contingency plan may be necessary if monitoring determines that the mitigation is not successfully meeting performance standards. In this case, the monitoring report will include a discussion of possible causes for failure to meet performance standards and will recommend appropriate actions to address the problem. The proposed contingency actions will depend on the problem being addressed. For example, if all plants of a single species die, a more appropriate replacement species will be determined for the site conditions. If invasive species out-compete the native vegetation, additional control efforts may be warranted. Under certain conditions, irrigation may be necessary. If implementation of a contingency plan is deemed necessary, all proposed actions will be planned and submitted to Thurston County for approval before they are implemented.

USE OF THIS REPORT

Within the limitations of scope, schedule, and budget, the findings presented in this report were prepared in accordance with generally accepted sensitive-area investigation principles and practices in this locality at the time the report was prepared. We make no other warranty, either express or implied.

This report was prepared for the use of Conwell Investments, LLC, and applicable regulatory agencies. No other party is entitled to rely on the information, conclusions, and/or recommendations included in this document without the express written consent of Landau. Further, the reuse of information, conclusions, and/or recommendations provided herein for extensions of the project or for any other project, without review and authorization by Landau, shall be at the user's sole risk.

CLOSING

This document has been prepared under the supervision and direction of the following key staff.

LANDAU ASSOCIATES, INC.



Steven Quarterman
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Attachment 1: Conceptual Mitigation Plan

REFERENCES

Landau. 2015. Oak Tree Habitat Assessment Technical Memorandum. Landau Associates, Inc. January 26.

Landau. 2013. Oak Habitat Evaluation Technical Memorandum. Landau Associates, Inc. October 16.

NWCB. 2023. Washington State Noxious Weed List. Washington State Noxious Weed Control Board.
https://www.nwcb.wa.gov/pdfs/2023-State-Weed-List_Scientific_Name-8.5x11.pdf.

ATTACHMENT 1

Conceptual Mitigation Plan

LANDAU
ASSOCIATES

- Legend**
- Stand A
 - Stand B
 - Stand C
 - Stand D
 - Proposed Habitat Corridor (Note 1)
 - Proposed Preservation Area (Notes 2, 3, & 4)

- Notes**
1. Create a habitat corridor from Stand A to Stand B by removing existing access road and enhancing with native vegetation.
 2. Preserve oak habitat in Stand A, enhance oak habitat by conducted oak release and removing invasive species. Oak habitat will be expanded with new oak plantings.
 3. Preserve oak habitat in Stand C, enhance oak habitat by conducting oak release, removing invasive species, and applying native seed mix.
 4. Preserve oak habitat in Stand B, enhance oak habitat by removing invasive species and applying native seed mix.
 5. Install wetland plantings in stormwater pond.
 6. Split rail fence and educational signage between public area and protected Stand A.

Source: Hutton, Gohat, Pantier, 2014
Conwell Property
Oak Tree Habitat Assessment
Thurston County, Washington

Conceptual Mitigation

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