

Reserves for Mazama Pocket Gopher Conservation

Considerations for the Thurston County HCP

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Purpose

The purpose of this document is to provide guidance on the selection of areas in Thurston County, Washington State, that are considered the most important for the long-term conservation and recovery of the three subspecies of *Mazama pocket gopher* (MPG) that occur in the County.

This guidance is intended to inform the development of the County's Habitat Conservation Plan (HCP). This information should also be used by all parties to direct and prioritize conservation acquisitions, grant funding, mitigation, zoning, restoration, research, and monitoring, to facilitate MPG conservation and recovery throughout Thurston County. This document will also be used to inform state and federal recovery planning.

This document is based on the best available science and professional judgment of agency personnel knowledgeable in the areas of MPG science, conservation biology, species recovery, and Endangered Species Act regulation.

This document will need to be updated to reflect new scientific results, additional information, or changed conditions for the subspecies and geographic area it covers.

Basis of Reserve System Identification

The maps at the end of this document identify lands that are the most appropriate for inclusion in a Reserve System for Thurston County's three subspecies of MPG. These are places in Thurston County where known physical, biological, and human factors indicate it is reasonably feasible to conserve MPGs. Specifically, these lands were selected considering one or more of the following primary characteristics:

- soil types that are most likely to support persistent gopher populations
- sites consistently occupied by gophers
- proximity to already conserved or protected habitat
- sites where development levels are low and/or land use is compatible

We recommend that conservation efforts for MPGs be focused on these lands.

This document uses eight Focal Areas to focus conservation for MPG subspecies:

- OPG-1, OPG-2: For Olympia pocket gopher (*Thomomys mazama pugetensis*)
- TPG: For Tenino pocket gopher (*T. m. tumuli*)
- YPG-1, YPG-2, YPG-3, YPG-4: For Yelm pocket gopher (*T. m. yelmensis*)
- UNK: For pocket gophers of unknown (not yet determined by genetic analysis) subspecies at Chambers Prairie (*T. m. sp.*)

YPG5 →

In each Focal Area one or more proposed Reserve Priority Areas are identified. Through focused conservation and planning work, parcels within each Reserve Priority Area would be secured to assemble a Reserve. As more Reserves are established, they collectively would comprise Thurston County's Reserve System.

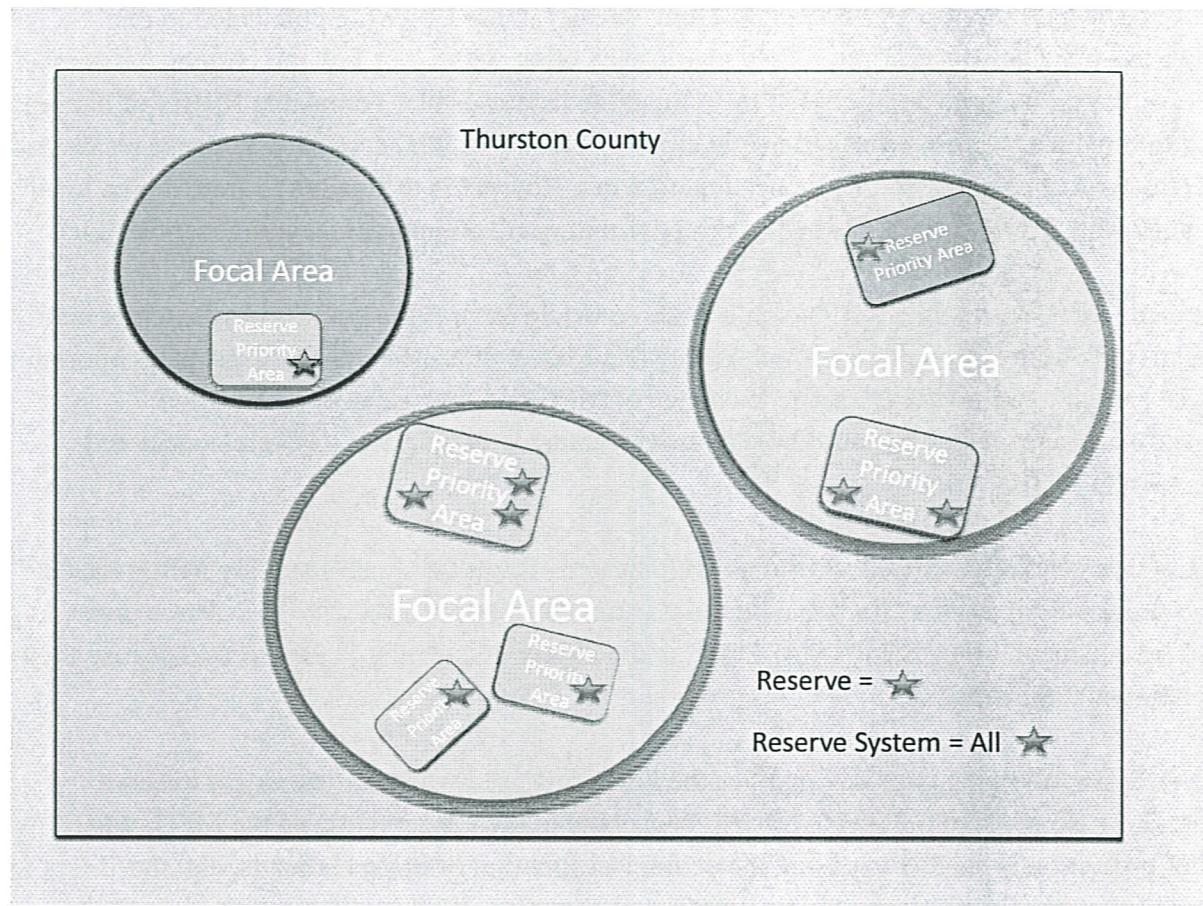
The following table summarizes the key terms used when discussing conservation of the subspecies across their range. It is useful to think of applying these terms at the landscape level.

TABLE 1. Terms used to identify components of landscape level conservation.

Term	Relevance to MPG	Description
Thurston County	Provides the only habitat for 3 subspecies of Mazama pocket gopher (Olympia, Tenino, and Yelm pocket gophers).	Geographically and politically defined area in South Puget Sound.
Focal Areas	General geographic areas associated with only one subspecies of MPG.	Eight Focal Areas are identified for MPG Reserve System in Thurston County.
Reserve Priority Areas	Specific areas where biological and physical conditions are favorable for MPG conservation and where conservation actions should be focused.	Areas identified by biologists using concepts described in this document to prioritize conservation. One or more Reserve Priority Areas are identified within a Focal Area. As individual parcels in each Reserve Priority Area are conserved, they will collectively form a Reserve.
Reserve System	Should provide for long-term conservation and recovery of all three subspecies of MPG.	A series of permanently protected lands in the County that benefit MPG (Reserves).
Reserves	Enables species survival in numbers adequate for long-term sustainability. Composed of Cores and Corridors.	An assemblage of permanently protected parcels within a Reserve Priority Area.

For a graphic representation of the terms in Table 1 above, see Figure 1 on the following page.

FIGURE 1. Generalized representation of terms used for a Thurston County Reserve System.



Concepts Underlying A Reserve System

Four subspecies of MPG (three of these occur only in Thurston County) are designated under the Endangered Species Act as threatened with extinction, due largely --like many other animal species-- to the destruction and degradation of their habitat. The concept behind assembling a Reserve System is to protect and manage enough areas of suitable habitat so that the species has the physical resources to survive into the future. A Reserve System is intended to conserve what has been identified as the most important habitat for a species; maintain or restore connectivity between and among habitats; and improve, restore, or prevent degradation of habitat quality.

Each Focal Area identified in this document is a geographic area where a particular subspecies of MPG is expected to occur based on current information. More than one Reserve may need to be assembled within a Focal Area to adequately conserve a subspecies. Reserves should be located

within Reserve Priority Areas, since these represent areas of greatest habitat value to the MPG within each Focal Area.

Cores and Corridors would comprise a Reserve. Within any Reserve, there should be one or more Cores which support an MPG population. Ideally, these Cores are connected to one another through Corridors, or physically adjoin each other with no or few intervening barriers. Reserves should be large and buffered by compatible land uses in a Permeable Matrix of habitat; this would reduce harmful effects to MPGs from incompatible land uses such as dense residential or commercial development. A primary function of a Reserve is to support a large, robust local population that is less susceptible to random environmental, demographic, and genetic events.

Permanent connectivity among Cores in a Reserve would be provided by Corridors; temporary connectivity would be provided through Permeable Matrix. Permeable Matrix provides enough suitable habitat to allow demographic exchange of MPG and may support small MPG populations. Lands which are not likely to provide suitable habitat for MPG are considered Impermeable Matrix.

Satellites are generally isolated areas that could become important for conserving MPGs based on new information, such as finding a previously unknown population of MPG. These areas would lie outside the Reserve Priority Areas, and possibly outside the Focal Areas, because they are unknown at this time.

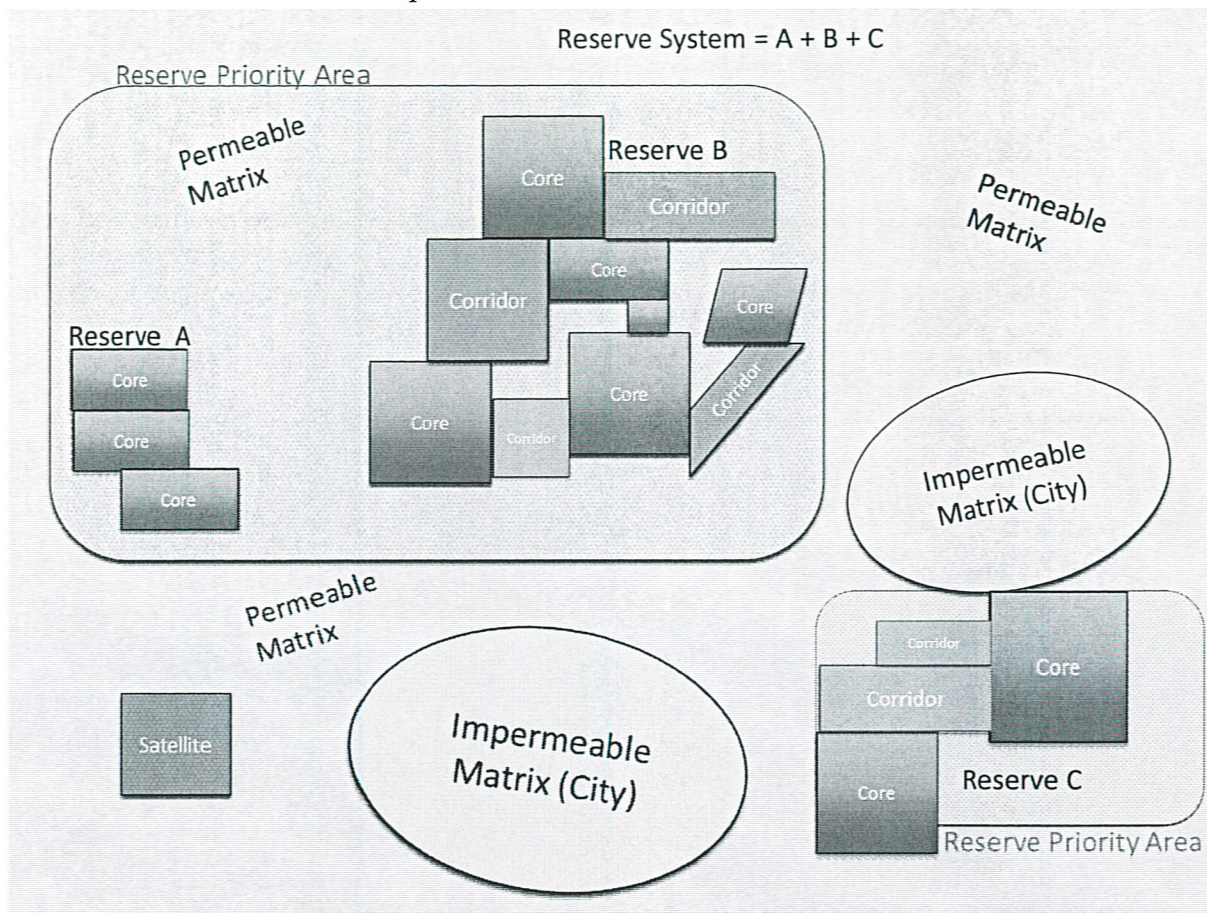
Table 2 on the following page summarizes the key terms used when envisioning a Reserve System, how elements of a Reserve System contribute to the conservation of the MPG, what level of protection is needed to ensure the ecological function of those elements, and the mechanisms typically employed to implement such a system. It is useful to think of applying these terms at the parcel scale. For more detail on concepts associated with MPG conservation that affected our selection of Reserve Priority Areas, see Appendix 1.

Table 2. Terms used to identify components and context of a reserve system.

Term	Function and Characteristics	Protection and Management	Typical Mechanisms to Achieve
Core	Supports a local MPG population. Typically, consistently occupied by MPGs. One or more Cores that are adjoining or connected by Corridors form a Reserve.	Permanent protection. Management specifically for MPG benefit and persistence.	Fee acquisition for conservation; conservation easement; stewardship endowment; management.
Corridor	Connectivity; allows individual MPG movement and occupancy between Cores.	Permanent protection. Management is compatible with MPG occupancy.	Conservation easement with management to maintain rural residential, low intensity agriculture, and open space.
Satellite	Supports MPGs. Satellites could be located outside a Reserve Priority Area or a Focal Area. No satellites are identified in this document, but could occur based on new information and their benefit to MPGs.	Permanent protection. Management is compatible with, or specifically beneficial to MPG occupancy.	Fee acquisition for conservation; conservation easement; management.
Permeable Matrix	Connectivity; allows demographic exchange among Cores, Corridors, Satellites, and Reserves. Potentially supports small populations of MPGs.	Non-permanent or temporary protection.	Zoning; use as open space, agriculture, or low density development.
Impermeable Matrix	No connectivity or poor connectivity. Predominantly unsuitable habitat for MPGs.	None or interim.	Zoning; development; use as dense residential development, commercial development, or roads

For a graphic representation of the terms in Table 2 above, see Figure 2 on the following page.

FIGURE 2. Generalized representation of terms used for elements within a focal area.



Maps of Focal Areas with Reserve Priorities

This document contains five maps that generally show Focal Areas in Thurston County. Within each Focal Area one or more Reserve Priority Areas are identified and prioritized. Reserve Priority Areas are where actions should be focused to conserve MPGs.

Assembling Reserves

Reserve assembly is likely to result from voluntary conservation or required compensatory mitigation, in keeping with County-level habitat conservation planning and federal/state protection of the Mazama pocket gopher.

When an entity wants or needs to conserve habitat for Mazama pocket gopher, that entity should first look for parcels of land within the Reserve Priority Areas identified in this document. That entity should use criteria in this document for evaluating specific parcels within Reserve Priority Areas.

Different criteria should be used depending on whether a parcel is being selected for a non-mitigation purpose or specifically for compensatory mitigation. See Appendix 2 for “Criteria for Selecting Parcels to Assemble Reserves (Non-Mitigation)” and Appendix 3 for “Criteria for Selecting Parcels to Assemble Reserves (Mitigation).”

Appendix 1

Concepts of the Reserve System and Reserve Priorities

1. Reserve System

- a. A Reserve System contributes to our goal of high likelihood of species persistence, considering human population growth and development trajectories.
- b. The Reserve System is made up of Reserves of sufficient number, size, and spacing to conserve the threatened MPG subspecies for longer than 100 years.
- c. The basis of the Reserve System is multiple large Core areas which are occupied by MPGs and ideally connected to other Core areas and habitat patches. These Core areas are part of the individual Reserves within the Reserve System.
- d. Reserves should be resilient to catastrophic events and weather extremes by having variation in habitat, redundancy across the landscape, large sizes, etc.
- e. While small or isolated habitat patches may support individuals or habitat now and in the near-term, the most likely scenario for long term success is conserving the greatest number of individuals within a subspecies on the largest blocks of habitat possible. Individual Reserves should be connected through Permeable Matrix to increase resiliency and therefore long-term success.

2. Focal Areas

- a. A Focal Area is a current or historical prairie landscape associated with, or intended to be associated with, one subspecies of MPG.
- b. Each Focal Area is intended to contain one of the subspecies based on the current taxonomic subspecies designations. These taxonomic designations are morphologically based and no published genetic data currently exists to provide guidance in the delineation of each subspecies range on the landscape. Research continues to gather and analyze genetic information to add certainty to these delineations. The hypothesized range of each subspecies encompasses at least one, or up to four Focal Areas.
- c. There are areas within Thurston County where the MPG present on a site have not been definitively identified to subspecies. Best scientific judgment will be used, where necessary, to make appropriate management determinations.
- d. Focal Areas are drawn with generalized boundaries due to uncertainty about gopher distribution or location characteristics. Portions of Focal Area boundaries which appear specific are based on a combination of natural and human-made features, some of which are assumed to be dispersal barriers.

3. Reserve Priority Areas

- a. A Reserve Priority Area is part of a current or historical prairie landscape that supports a single subspecies of the MPG.
- b. There may be more than one Reserve Priority Area for a given subspecies, within a Focal Area.
- c. A Reserve Priority Area identifies where one or more Reserves could be assembled based on a number of factors including soil type, known MPG locations, landscape context, habitat connectivity, and development level.

4. Reserves

- a. Reserves include Cores and Corridors.
- b. Larger and more numerous Reserves increase species survival probability over the long-term.
- c. Reserves may be composed of a mix of ownerships (Federal, state, local government, private, tribal, non-governmental) and designations (open space, preserve, mitigation site, park, conservation bank).
- d. As the Reserves are assembled it is presumed that current occupancy by MPGs provides the highest level of certainty when estimating the value of habitat.
- e. More than one Reserve may occur within a Reserve Priority Area.

5. Cores

- a. One or more Cores may occur within a Reserve.
- b. Cores are potentially pieced together from individual parcels.
- c. Cores should be conservation lands (e.g. State Wildlife areas, Natural Area Preserves, mitigation banks, etc.) that are often large contiguous blocks.
- d. Cores can adjoin each other or be connected through Corridors.
- e. Cores are sources to some local populations; contribute substantial numbers of individuals to the overall population within a subspecies; and may be composed of both resident and dispersal habitat.
- f. Consistently occupied parcels are generally ideal cores.
- g. Cores will be conserved and specifically managed to benefit MPGs.
- h. Cores are not expected to provide all the habitat needed for MPG recovery.
- i. Larger Cores are more likely to buffer against the many uncertainties involved in conservation planning for the MPG. For example, resiliency in the face of catastrophic events, such as extreme weather events, may be buffered by a single large site with a range of different habitat characteristics (e.g., varying soil depths and drainage characteristics).
- j. While larger parcels likely provide greater conservation benefit for a number of reasons, smaller parcels are also important as “stepping stone” sites for dispersal; for supporting the permeability of matrix habitat; as a buffer against catastrophic events; and in supporting genetic diversity.
- k. Optimal sizes of Reserves may be informed through research.
- l. Cores may contain a mix of habitat quality, but should be managed to maintain or improve habitat for MPG.

- m. Cores have the highest value for MPGs and should be permanently and legally protected, managed for MPG persistence, and permanently endowed (where possible).

6. Corridors

- a. Corridors provide connectivity for MPG between Cores.
- b. Connectivity for MPG means the existence of habitat that enables movements and demographic exchange between aggregations of MPGs.
- c. The selection of areas for Corridors is best determined through occupancy by MPGs, due to limited dispersal distances.
- d. Habitat that provides connectivity between Cores should have a low impervious surface component, providing opportunities for individual MPGs to burrow, take intermittent refuge, and establish territories.
- e. MPGs have been documented to cross roads and occupy vegetated road right-of-ways. Roads generally restrict movement across them, but may provide connectivity along rights of way.
- f. Land uses in Corridors must be compatible with maintaining occupancy of MPG.
- g. Lands with suitable habitat such as some agricultural lands, some rural density lands, some open space, and some undeveloped lands may contribute to connectivity between or among Cores or Reserves. If permanently protected, these are Corridors; if not permanently protected, then they lie within Permeable Matrix.
- h. Connectivity may be secured through Corridors that link Cores or may be more generally provided through lands that have conditions favorable to MPG use or movement (Permeable Matrix).

7. Satellite

- a. A Satellite is generally an isolated area that would occur outside a Reserve Priority Area if a parcel with high value for MPG conservation was discovered.
- b. Satellite locations are not known at this time, but will be identified on a case-by-case basis.

8. Matrix (Permeable and Impermeable)

- a. Permeable Matrix: Land that could or does provide connectivity due to its current habitat condition. Permeable Matrix may be usable by MPG, but is not legally conserved or permanently protected. Zoning could maintain this Permeable Matrix in the short-term and/or under the Thurston County HCP. Permeable Matrix is likely to provide demographic and genetic support to the Reserves, and micro- and/or macrosite diversity.
- b. Impermeable Matrix: Land that is not conducive to MPG occupancy, survival, or dispersal. Impermeable Matrix may provide some small amount of support for MPG, but is unlikely to provide a strong conservation benefit.
- c. The value of Matrix lands to MPG is affected by zoning and land use.

Appendix 2

Criteria for Selecting Parcels to Assemble Reserves (Non-Mitigation)

Factors to consider when evaluating a parcel for a reserve include: occupancy by MPG, soils present, parcel size, habitat quality, potential for habitat improvement, adjacency or connectivity to other MPG-occupied sites, site access, current extent of MPG occupation on the site, likelihood of prior occupation of the site by MPGs, site resiliency, compatibility with surrounding uses, management and defensibility of the site, barriers to MPG movement or dispersal, predation risk, presence of other species, and overall prairie ecosystem function and diversity of the site.

The following criteria should be used when evaluating a non-mitigation parcel for inclusion in an MPG Reserve.

- 1) A parcel should be located within the Reserve Priority Areas identified in Maps 1- 5.
- 2) A parcel should be selected if it (in order of preference):
 - a) is occupied by MPG (naturally-occurring)
 - b) is currently unoccupied, but was historically occupied, by MPG
 - c) has a predominance of Nisqually, Indianola, Spanaway, Spanaway-Nisqually soils and is adjacent to areas occupied by MPG
 - d) has the same soils as adjacent areas occupied by MPG
 - e) has a predominance of Nisqually, Indianola, Spanaway, Spanaway-Nisqually soils, even if not adjacent to areas occupied by MPGs
- 3) Parcel suitability and desirability increases when:
 - a) The site is predominantly vegetated by native prairie forbs and grasses.
 - b) The site is federally-designated critical habitat.
 - c) The site is adjacent to federally-designated critical habitat.
 - d) The site is adjacent to a site permanently conserved and managed for prairie species, prairie habitats, or MPG.
 - e) The site is or can be functionally connected via permanently conserved land to federally-designated critical habitat or a site permanently conserved and managed for prairie species, prairie habitats, or MPG.
 - f) The site is adjacent to, or provides connectivity with species strongholds (for example, public multi- use lands, airports, or military training areas).
- 4) A parcel should be legally and permanently protected for conservation (permanently conserved), managed, and endowed to help ensure its long-term ecological value and continuing benefit to MPG.

Appendix 3

Criteria for Selecting Parcels to Assemble Reserves (Mitigation)

The following criteria will apply when evaluating parcels for Mazama pocket gopher (MPG) mitigation.

- 1) Proposed mitigation parcels will be located within Reserve Priority Areas identified in Maps 1- 5. Such parcels must be evaluated and approved by U.S. Fish and Wildlife Service (USFWS) to qualify as mitigation for proposed impacts to MPGs.
- 2) Mitigation parcels outside the Reserve Priority Areas may be considered on a case-by-case basis, but may incur a longer review process and may be subject to additional requirements, including significantly higher mitigation ratios.
- 3) All parcels for mitigation will be legally and permanently protected for conservation (permanently conserved), managed, and endowed to help ensure their long-term ecological value, and will be consistent with the 2003 USFWS Conservation Banking guidance and the most current USFWS recommendations for implementing that guidance specific to federally-listed species conservation.
- 4) Reserves that are 300 acres in size or larger are preferred. An aggregate of mitigation and conservation parcels may comprise a reserve. These must be predominantly underlain by MPG soils. In general, large sites functionally connected to permanently conserved lands are preferred. In general, larger parcels are more desirable.
- 5) Characteristics that increase the suitability and desirability of a parcel(s) for mitigation and inclusion in a reserve include (not ordered):
 - a) The site is predominantly vegetated by low-statured forbs and grasses, and is not a monoculture.
 - b) The site is federally-designated critical habitat.
 - c) The site is adjacent to federally-designated critical habitat with few intervening physical barriers.
 - d) The site is adjacent to a site permanently conserved and managed for prairie species, prairie habitats, or MPG.
 - e) The site is functionally connected via permanently conserved land to federally-designated critical habitat or a site permanently conserved and managed for prairie species, prairie habitats, or MPG.
 - f) The site is adjacent to, or provides connectivity with, species strongholds (for example, public multi- use lands, airports, or military training areas).
- 6) Sites selected to mitigate impacts to MPGs and their habitat will preferably be occupied by MPGs or if not, underlain by soils known to support MPGs year-round, on slopes less than 15 percent, and within the same MPG subspecies range as where the impact occurs.

- 7) Sites for MPG mitigation will, in order of preference, be located:
 - a) on parcels occupied by MPG (naturally-occurring)
 - b) is currently unoccupied by MPG but has known historical, naturally-occurring MPG occupancy
 - c) on parcels with a predominance of Nisqually, Indianola, Spanaway, Spanaway-Nisqually soils and adjacent to areas occupied by MPGs
 - d) on parcels with the same soils as adjacent areas occupied by MPGs
 - e) on parcels with a predominance of Nisqually, Indianola, Spanaway, Spanaway-Nisqually soils which may not be adjacent to areas occupied by MPGs.
- 8) There are 3 subspecies of MPG in Thurston County, Washington. Impacts to a particular subspecies will be mitigated within the geographic area associated with that subspecies. Specifically, impacts to *T. m. pugetensis* (Olympia pocket gopher) will be mitigated within the range of *T. m. pugetensis*. Impacts to *T. m. tumuli* (Tenino pocket gopher) will be mitigated within the range of *T. m. tumuli*. Impacts to *T. m. yelmensis* (Yelm pocket gopher) will be mitigated within the range of *T. m. yelmensis*.

While a range is hypothesized for each MPG subspecies, the outer extent of each subspecies' range is not precisely delineated. Thus, if an impact occurs in such an area, USFWS will work with those needing to provide mitigation to determine where the mitigation shall occur.

In addition, a fourth subspecies of MPG, *T. m. glacialis* (Roy Prairie pocket gopher), occurs in Pierce County, Washington. Impacts to this species will be mitigated within its range. However, MPG impacts in Thurston County may, on a case-by-case basis, be mitigated in Pierce County to benefit the Roy Prairie pocket gopher, due to its limited range outside the boundaries of Joint Base Lewis-McChord.

- 9) USFWS will consider a number of other factors when evaluating possible mitigation locations for MPGs, including: parcel size, habitat quality, potential for habitat improvement, adjacency or connectivity to other known occupied areas, site access, current extent of MPG occupation on the site, likelihood of prior occupation of the site by MPGs, site resiliency, compatibility with surrounding uses, management and defensibility of the site, barriers to MPG movement or dispersal, predation risk, presence of other species, and overall prairie ecosystem function and diversity of the site.