

New LP: 3

Latest Date species became a Candidate: October 30, 2001

 Candidate removal: Former LP:

 A - Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

 F - Range is no longer a U.S. territory.

 I - Insufficient information exists on biological vulnerability and threats to support listing.

 M - Taxon mistakenly included in past notice of review.

 N - Taxon may not meet the Act's definition of "species."

 X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Rodent; Geomyidae (pocket gophers)

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Washington

CURRENT STATES/ COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE:
Washington

LEAD REGION CONTACT: Scott McCarthy (503/231-6131)

LEAD FIELD OFFICE CONTACT: Western Washington Fish and Wildlife Office; Dr. L. Karolee Owens (360/753-4369)

BIOLOGICAL INFORMATION:

Most of the following biological information is condensed from Steinberg (1995, 1996, 1999a).

Species Description

Adult Mazama pocket gophers (Thomomys mazama) are reddish brown to black above, and the underparts are lead colored and tipped with buffy. Lips, nose, and patches behind the ears are black; the wrists are white. Adults range from 175 to 273 millimeters (mm) (7 to 11 inches (in)) in total length, with tails that range from 45 to 85 mm (2 to 3 in) (Hall 1981).

Mazama pocket gophers are morphologically similar to other species of pocket gophers that exploit a subterranean existence. They are stocky and tubular in shape, with short necks, powerful limbs, long claws, and tiny ears and eyes. Short, nearly hairless tails are highly sensitive and probably assist in navigation in tunnels. Pocket gophers tunnel and burrow with teeth and claws. Their "pockets" are external, fur-lined cheeks on either side of the mouth. These pockets are used to transport nesting material and carry plant cuttings to storage compartments.

Pocket gophers' diet includes a wide variety of plant material, including leafy vegetation,

succulent roots, shoots, and tubers. Although as consumers of crop plants they are considered agricultural pests, in natural settings they play an ecological role by aerating soils and stimulating plant growth. In prairie ecosystems, pocket gopher activity is important in maintaining species richness and diversity.

Pocket gophers rarely surface completely from their burrows, although they do disperse above ground. They are highly asocial and intolerant of other gophers. Each maintains its own burrow system, and multiple occupancy occurs only for brief periods during mating seasons and prior to weaning young. The mating system is probably polygynous and most likely based on female choice. The adult sex ratio is biased toward females, often as much as 4:1.

Population density and spatial distribution is generally determined by the distribution of appropriate habitat, patch sizes of suitable soil type, and the number of territories that can be supported by the food resources. One site having a deep soil layer that was much less rocky had a pocket gopher population density five times that of another site having rocky soil (Steinberg 1996). A study of the relationship of soil rockiness and the distribution of pocket gophers revealed the proportion of the weight of soil samples due to medium (greater than 12.7 mm (0.5 in) but less than 50.8 mm (2.0 in)) rocks correctly predicted presence or absence of pocket gophers in eight of nine prairies sampled (Steinberg 1996). In a study of the distribution of pocket gophers on Fort Lewis Military Reservation (Fort Lewis), pocket gophers did not occur in areas with high vegetation cover of Scot's Broom (*Cytisus scoparius*), a highly invasive and nearly indestructible nonnative plant, or where mole populations were particularly dense (Steinberg 1995).

Taxonomy

Prior to 1960, the pocket gophers of western Washington were considered to be subspecies of *Thomomys talpoides*. Based on characteristics of the bacula (penis bone), Johnson and Benson (1960) found the western Washington complex of pocket gophers to be much more similar to *Thomomys mazama*, which occurs in western Oregon and northwestern California. Subsequently, the western Washington populations have been classified as subspecies of *Thomomys mazama*.

Eight subspecies of *Thomomys mazama* have been identified in western Washington (Hall 1981). Two of these subspecies, the Cathlamet (*T. M. louiei*) and Tacoma (*T. M. tacomensis*) pocket gophers, may be extinct. Recent genetic analyses indicate that the Puget Sound prairie pocket gopher subspecies (*T. M. glacialis*, *T. M. pugetensis*, and *T. M. yelmensis*) are not substantially genetically differentiated and may actually represent one subspecies (Steinberg 1999a,b). This subspecies may also include the Tenino pocket gopher (*T. M. tumuli*) and the Tacoma pocket gopher (*T. M. tacomensis*), if these two subspecies still exist. No pocket gophers were found in the described range of *T. M. tumuli*, but its distribution suggests it belongs to this group (Steinberg 1995).

Habitat

The Mazama pocket gopher is associated with glacial outwash prairies in western Washington, an ecosystem of conservation concern (Hartway and Steinberg 1997). Steinberg and Heller (1997) found that Mazama pocket gophers are even more patchily distributed than are prairies. There are many seemingly high quality prairies within the species' range that lack pocket gophers. Pocket gopher distribution has probably always been highly patchy. Their prairie habitat has a patchy distribution, and there is an even patchier distribution of soil rockiness within the prairie expanses (Steinberg and Heller 1997).

Historical and Current Range/Distribution

Steinberg (1995) assessed the current distribution of the Mazama pocket gopher and found that many of the historical populations have disappeared or diminished substantially enough in size that their presence was not obvious. The Cathlamet pocket gopher is known only from the type locality in Wahkiakum County, but no evidence of pocket gophers was found at that site since 1956. The Cathlamet pocket gopher was originally found in a large burn that subsequently regenerated to forest. The forest has recently been clearcut, but pocket gophers have not been found at this site since 1956, despite brief survey efforts in the 1970s, 1980s, and 1990s (Derek Stinson, Washington Department of Fish and Wildlife (WDFW), pers. comm. 2003).

The Olympic pocket gopher is found in the Olympic National Park in Clallam County where it is restricted to subalpine habitat of the higher Olympic Mountains. Although this is probably the most stable of the subspecies in Washington, three populations were extirpated by 1951, and one was extirpated by 1976 (Johnson 1977). Johnson (1977) suggested extirpations of Olympic pocket gopher populations may have been related to fire suppression, avalanches, land slides, and weather cycles. Steinberg (1995, 1996, 1999a) documented Olympic pocket gophers at several sites; however, no complete inventory has been done in the park.

One population of the Shelton pocket gopher was detected at the Shelton airport in Mason County, and mounds were found on penitentiary grounds near Shelton. The airport population was estimated to include 990 pocket gophers. However, this population estimate was a crude estimate based on using apparent gopher mounds to delineate the number of territories, a method that has not been tested (D. Stinson, pers. comm. 2004). Another population, estimated to include several hundred pocket gophers, was in a regenerating clearcut colonized by pocket gophers after 1992 (WDFW 2001b). The latter site may no longer support pocket gophers (D. Stinson, pers. comm. 2004). Other patchy populations may occur nearby on private land (Steinberg 1995, 1996).

The Roy Prairie pocket gopher is known only from Roy Prairie in Pierce County. One sparse population of pocket gophers was found south of Roy, and populations were detected nearby on Fort Lewis (Steinberg 1996). The Olympia, Tenino, and Yelm pocket gophers are known from Thurston County. Several populations of the Olympia pocket gopher were found south of Olympia. The Tacoma pocket gopher was known to occur in Pierce County. The last recorded specimens of the Tacoma pocket gopher were killed by cats in Wapato Hills in 1994; none were detected in 1998 (WDFW 2001b). Surveys of the Tenino pocket gopher historic location at Rocky Prairie Natural Area Preserve did not detect any signs of pocket gopher activity, but a

pocket gopher carcass was found (Steinberg 1996). Several relatively large populations of Yelm pocket gophers were detected on Johnson and Weir prairies on Fort Lewis near the town of Rainier (Steinberg 1996). None were found in Tenino, Vail, or Rochester, but populations could still occur on private land (Steinberg 1996).

Steinberg (1996) surveyed all historical and currently known sites and all sites listed by the Washington Department of Natural Resources (WDNR) as having Carstairs, Nisqually, or Spanaway gravelly or sandy loam soil, and which WDNR determined to have vegetation that was intact prairie or restorable to prairie. Two previously unidentified populations were found at Scatter Creek Wildlife Area and at Rocky Prairie. The Rocky Prairie site was degraded, but a small patch of pristine mounded prairie dominated by native plants supported a small population of pocket gophers. A number of sites surveyed had rocky and compacted soils and no evidence of pocket gophers were found (Steinberg 1996).

Because populations tend to be small and isolated, and the geographic distribution appears to be shrinking, this entire complex of pocket gophers may be threatened with extinction (Steinberg 1995). Pocket gophers have limited dispersal capabilities, and the loss and degradation of additional patches of appropriate habitat could result in further isolation of populations, increasing their vulnerability to extinction.

Population Estimates/Status

There are no historical data and little quantitative data on current populations of Mazama pocket gopher populations in Washington. Several populations are now extinct. Two, and possibly three, subspecies are believed to be extinct. Knowledge of the past and present status of the Mazama pocket gopher is limited to distributional information. Recent surveys have focused on determining current distribution.

THREATS:

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

The prairies of south Puget Sound are one of the rarest habitats in the United States (Dunn and Ewing 1997). Drastic changes have occurred in the southern Puget lowland landscape over the last 150 years, including a 90–95 percent reduction in prairie habitat. The acreage occupied by south Puget Sound prairies that resemble original grasslands may only be one percent of the distribution of prairie soil types, when viewed in terms of native species composition and dominance (Crawford and Hall 1997). The basic ecological processes that maintain prairies have disappeared from, or have been altered on, the few protected prairie sites. Fire regimes have been altered, and prairie habitat has been invaded by nonnative species (Dunn and Ewing 1997). Fire suppression allows Douglas-fir (*Pseudotsuga menziesii*) to encroach on and overwhelm prairie habitat (WDFW 2001b).

Several fairly large populations of pocket gophers have been identified on Fort Lewis. Their absence from some areas, however, may be related to compaction of the soil due to years of

heavy tank use, collapsing tunnel systems, and impeding burrowing activities of pocket gophers (Steinberg 1995).

The extremely patchy distribution of pocket gophers where they occur on Fort Lewis is related to local habitat conditions. In a study of the distribution of pocket gophers on Fort Lewis, pocket gophers did not occur in areas with thick Scot's broom or where mole populations were particularly dense (Steinberg 1995).

In addition to military activities on Fort Lewis, prairie habitat and Mazama pocket gophers are threatened by other proposed development on Fort Lewis. Projects in the planning stages include the Cross-Base Highway, proposed for construction by Pierce County, Washington Department of Transportation, and the Federal Highways Administration.

The glacial outwash gravels underlying the south Puget Sound prairies are deep and valuable for use in construction and road building. One of the historic Tacoma pocket gopher sites became a large gravel pit. Two gravel pits are now operating on part of the remaining Roy Prairie pocket gopher habitat (WDFW 2001b; D. Stinson, pers. comm. 2004).

The two populations located at airports (Port of Olympia and Port of Shelton) are threatened by development. The Port of Olympia is realigning the airport runway. The Port of Shelton hopes to develop the area now occupied by the Mazama pocket gopher and has hired a consultant to investigate moving the pocket gophers to a more convenient area (D. Stinson, pers. comm. 2003).

B. Overutilization for commercial, recreational, scientific, or educational purposes.

Although not currently known to be a factor, one population at Lost Lake Prairie in Mason County may have been extirpated as a result of collecting by Dalquest and Scheffer in 1944 (WDFW 2001b). The U.S. Department of Agriculture collected Mazama pocket gophers for research purposes as recently as 2001, and Mazama pocket gophers may be extirpated from one trapping site (D. Stinson, pers. comm. 2003).

C. Disease or predation.

House cat predation is a threat to Mazama pocket gophers. Urbanization, particularly in the south Puget Sound area, has resulted in not only habitat loss, but the exposure of this species to domestic and feral house cats. Domestic cats are known to have serious impacts on small mammals and birds and have been implicated in the decline of several threatened and endangered mammals, including marsh rabbits and beach mice in Florida and the kangaroo rat in California (Kelly and Rotenberry 1993; Jurek 1994). At least two of the Mazama pocket gopher locations were found as a result of house cats bringing home pocket gopher carcasses (WDFW 2001a). The last specimens and last known individuals of the Tacoma pocket gopher were carcasses brought home by cats (D. Stinson, pers. comm. 2004).

D. The inadequacy of existing regulatory mechanisms.

Three of the *Mazama* pocket gopher subspecies (Roy Prairie, Louie's (Cathlamet), and Tacoma) were included as Category 2 species in the Federal Notice of Reviews until 1996 (61 FR 7596), when we discontinued the designation of Category 2 species as candidates. The species was made a candidate again in 2001 (66 FR 54808).

The *Mazama* pocket gopher, including all subspecies in Washington, is now included on the WDFW candidate list, but receives no protection under State law. There is no State Endangered Species Act in Washington. The Washington Fish and Wildlife Commission has the authority to list species. State listed species are protected from direct take, but their habitat is not protected. As a Priority Species, the *Mazama* pocket gopher may receive some protection of its habitat under environmental reviews of applications for county or municipal development permits (WDFW 2001b).

E. Other natural or manmade factors affecting its continued existence.

Most species' populations fluctuate naturally, responding to such factors as weather events, disease, and predation. Johnson (1977) suggested these factors, however, have less impact on a species with a wide and continuous distribution. Populations that are small, fragmented, or isolated by habitat loss or modification of naturally patchy habitat, and other human-related factors, are more vulnerable to extirpation by natural randomly occurring events and cumulative effects.

Historically, *Mazama* pocket gophers probably persisted by continually recolonizing habitat after local extinctions. The loss of habitat patches, resulting in widely separated populations, has likely stopped much of the recolonization that historically occurred (WDFW 2001b).

As consumers of crop plants, pocket gophers are considered to be agricultural pests. The type locality for the Cathlamet pocket gopher was on a tree farm. Several site locations on the WDFW wildlife survey database were found as a result of trapping on Christmas tree farms, a nursery, and in a livestock pasture (WDFW 2001a).

One population on private land is in an area used by local residents to walk their dogs, and the dogs attempt to dig up and kill pocket gophers (D. Stinson, pers. comm. 2003).

SUMMARY OF REASONS FOR ADDITION, REMOVAL OR LISTING PRIORITY CHANGE

Three subspecies may already be extinct. Specific losses of habitat have occurred at known localities at Roy Prairie habitat to gravel mines and through regeneration of a clearcut where pocket gophers had been found. Threats of development at airport localities continue. These factors and additional losses of prairie habitat to development, gravel mining, and other human activities on private lands that may support *Mazama* pocket gopher populations indicate an increased imminence of threat to the *Mazama* pocket gopher. Increased imminence of the threats changes the LPN from a 6 to a 3.

____Is the removal based on a Policy for Evaluation of Conservation Efforts When Making Listing Decisions (PECE) finding. If “Yes”, summarize the specific PECE evaluation criteria that were met in determining that the conservation effort is sufficiently certain to be implemented and effective so as to have contributed to the elimination or adequate reduction of one or more threats to the species identified through the section 4(a)(1) analysis.

FOR PETITIONED CANDIDATE SPECIES (also complete c and d for initial 12-month petition findings):

- a. Is listing warranted? Yes
- b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? Yes
- c. Is a proposal to list the species as threatened or endangered in preparation? No
- d. If the answer to c. above is no, provide an explanation of why the action is precluded.

We find that the immediate issuance of a proposed rule and timely publication of a final rule for this species has been for the preceding 12 months, and continues to be, precluded by higher priority listing actions (including candidate species with lower LPNs). During the past 12 months, almost our entire national listing budget has been consumed by work on various listing actions to comply with court orders and court-approved settlement agreements, emergency listings, and essential litigation related, administrative, and program management functions. We will continue to monitor the status of this species as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures. For information on listing actions over the past 12 months, see the discussion of “Progress on Revising the Lists,” in the current CNOR, which can be viewed on our Internet website (<http://endangered.fws.gov/>).

LAND OWNERSHIP:

On Federal land, one population occurs in Olympic National Park and several populations occur on Fort Lewis. On State land, one population occurs at the Scatter Creek Wildlife Area. On county land, one population occurs at the Port of Shelton and one population occurs at the Port of Olympia. The majority of the populations are on public land, with approximately 70 percent on public land and 30 percent on private land (D. Stinson, pers. comm. 2003). All locations and exact numbers of populations and sizes of populations are not known. Recent surveys have focused on determining current distribution.

PRELISTING :

Fort Lewis, in conjunction with The Nature Conservancy, has initiated management activities to restore and maintain native prairie vegetation. The Nature Conservancy is also involved in habitat restoration with Thurston County on Black River-Mima Prairie Glacial Heritage Preserve. WDFW has initiated restoration work on Scatter Creek Wildlife Area, although the initial focus

has been on Scot's broom control. WDNR removed Douglas-fir and planted native prairie plants on the Rocky Prairie Natural Area Preserve with a grant from the U.S. Fish and Wildlife Service. They also conducted prescribed burning on Mima Mounds Natural Area Preserve. WDFW recently added land to the Scatter Creek Wildlife Area. WDFW has secured some funding and is seeking partners to acquire land in the area informally known as "West Rocky Prairie," the largest and best remaining south Puget Sound prairie in private hands. The site may become a gravel mine if sufficient funding to acquire the property is not found. WDFW is preparing a status review of the *Mazama* pocket gopher.

DESCRIPTION OF MONITORING:

We maintain contact with the responsible agencies and species experts and annually request their reviews and updates to the candidate assessment forms during the revision process. Relevant literature and data for this species are obtained principally from contacts with responsible agencies and experts and their reports. Periodic literature searches for this species are also completed.

REFERENCES:

- Center for Biological Diversity and Northwest Ecosystem Alliance. 2002. Petition to list Shelton pocket gopher (*Thomomys mazama couchi*), Roy Prairie pocket gopher (*Thomomys mazama glacialis*), Cathlamet pocket gopher (*Thomomys mazama louei*), Olympic pocket gopher (*Thomomys mazama melanops*), Olympia pocket gopher (*Thomomys mazama pugetensis*), Tacoma pocket gopher (*Thomomys mazama tacomensis*), Tenino pocket gopher (*Thomomys mazama tumuli*), Yelm pocket gopher (*Thomomys mazama yelmensis*) as federally endangered species.
- Crawford, R. C., and H. Hall. 1997. Changes in the Puget Sound prairie landscape. Pages 11–15 in P. Dunn and K. Ewing, eds. South Puget Sound prairie landscapes. The Nature Conservancy of Washington, Seattle.
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- Hartway, C., and E.K. Steinberg. 1997. The influence of pocket gopher disturbance on the distribution and diversity of plants in western Washington prairies. Pages 131–139 in P. Dunn and K. Ewing, eds. South Puget Sound prairie landscapes. The Nature Conservancy of Washington, Seattle.
- Johnson, M.L. 1977. Natural extinction of populations of the pocket gopher of Olympic National Park. Unpublished manuscript and notes for presentation at the 1977 meeting of the American Society of Mammalogists.

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- Steinberg, E.K. 1995. A study of genetic differentiation and variation in the Mazama pocket gopher (*Thomomys mazama*) with emphasis on Fort Lewis populations. Final report submitted to Fort Lewis and The Nature Conservancy. 46 pp. + appendices.
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- _____. 1999a. Diversification of genes, populations, and species: evolutionary genetics of real and virtual pocket gophers (*Thomomys*). Ph.D. dissertation, U. of Washington, Seattle. 157 pp.
- _____. 1999b. Characterization of polymorphic microsatellites from current and historic populations of North American pocket gophers (*Geomyidae:Thomomys*). *Molecular Ecology* 8(6):1075-76.
- _____, and D. Heller. 1997. Using DNA and rocks to interpret the taxonomy and patchy distribution of pocket gophers in western Washington prairies. Pages 43-51 in P. Dunn and K. Ewing, eds. *South Puget Sound prairie landscapes*. The Nature Conservancy of Washington, Seattle.
- Washington Department of Fish and Wildlife. 1999. 1999 proposed revisions to the list of state candidate species. Unpublished report.
- _____. 2001a. Wildlife survey data management. Unpublished report.
- _____. 2001b. Draft Washington state status report for the Mazama pocket gopher. Unpublished report.
- Witmer, G.W., R.D. Sayler, and M.J. Pipas. 1996. Biology and habitat use of the Mazama pocket gopher (*Thomomys mazama*) in the Puget Sound area, Washington. *Northwest Science* 70(2):93-98.

LISTING PRIORITY

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3*
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Yes Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed?

Rationale for listing priority number:

Magnitude: The high magnitude of threat is due to populations with patchy and isolated distributions in habitats highly desirable for development and subject to a wide variety of human activities that permanently alter the habitat. The threat of invasive plant species to the quality of a highly specific habitat requirement is high and constant. There are few known populations of each subspecies. A limited dispersal capability, and the loss and degradation of additional patches of appropriate habitat will further isolate populations and increase their vulnerability to extinction. Loss of any of the subspecies will reduce the genetic diversity and likelihood of the continued existence of the *Thomomys mazama* subspecies complex in Washington.

Imminence: Threats to this species continues to be imminent. Two, and possibly three, subspecies are apparently extinct. The Roy Prairie pocket gopher were described as plentiful in 1983 but was reduced to a small population by 1993. Two gravel pits are now operating on part of the remaining habitat of the Roy pocket gopher. Populations of two other subspecies are located on airports, both with planned development.

Is Emergency Listing Warranted? No. Although there are few populations, they are widely scattered such that there is no single threat likely to result in extinction simultaneously. Management actions to restore and maintain prairie habitat have been initiated at several locations by State and Federal agencies, including WDFW, and Fort Lewis, and The Nature

Conservancy. WDFW is preparing a status report for the Mazama pocket gopher.

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes to the candidate list, including listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all 12-month petition findings, additions of species to the candidate list, removal of candidate species, and listing priority changes.

Approve:

David B. Allen
July 19, 2004
Regional Director,
Fish and Wildlife Service
Date

Concur: Matt Hogan, Acting

5/2/05
Director, Fish and Wildlife
Service Date

Do not concur: _____
Director, Fish and Wildlife Service

Date

Director's Remarks: _____

Date of annual review: June 23, 2004

Conducted by: L. Karolee Owens

Comments: _____

(rev. 4/22/04)