

Mazama Pocket Gopher

(*Thomomys mazama*)

State Status: Threatened, 2006

Federal Status: Candidate, 2001

Recovery Plan: State, 2013 (Draft)

The Mazama pocket gopher was state-listed as Threatened in 2006. In 2012, four subspecies were proposed for listing as Threatened under the Endangered Species Act (USFWS 2012).



Figure 1. Mazama pocket gopher (photo by Rod Gilbert).

The Mazama pocket gopher is one of the smallest of 35 species in the pocket gopher family. In Washington, it is only found west of the Cascades. It differs from the similar-sized northern pocket gopher (*T. talpoides*) of eastern Washington in fur color, tooth and skeletal characteristics, and a larger dark patch of fur behind their ears. Pocket gophers spend most of their time within their system of burrows. They are frequently confused with moles, but moles do not have prominent teeth (Figure 2), and the soil mounds that they leave behind are dome-shaped while the mounds left by gophers are often lower and more irregular or fan-shaped. Gophers are believed to be generally solitary and exclude other gophers from their burrows except when breeding and when females have litters. When pocket gophers have established a territory, they generally remain there, although they will shift their home range in response to seasonally wet soils.



Figures 2,3. Mazama pocket gopher showing characteristic incisors, front claws, and cheek pouches (left), and soil mounds created by a gopher (right).

Pocket gophers have been called ‘keystone species’ and ‘ecosystem engineers’ because they affect the presence and abundance of plants and other animals (Vaughan 1961, 1974; Reichman and Seabloom 2002). Their extensive excavations affect soil structure and chemistry, and their food caches and latrines enrich the soil, affecting plant community composition and productivity. Mazama pocket gophers eat a wide variety of roots and above-ground plant parts. Perennial forbs are preferred over grasses, and fleshy roots and bulbs, such as camas (*Camasia* spp.) are important when green vegetation is not available. Gophers also eat fungi and disseminate the spores of species that have an important role in facilitating plant growth. Mazama pocket gophers are an important prey species for many predators, including hawks, owls, coyotes, and weasels, and their burrows provide retreats for many salamanders, western

toads, frogs, lizards, small mammals, and invertebrates (Stinson 2005).

Several populations are sufficiently distinct to be described as separate subspecies, particularly those that are geographically isolated. The species is currently represented in Washington by six existing subspecies (Figure 2). Mazama pocket gophers are currently known to be in Clallam (1), Mason (2), Pierce (4) and Thurston (5,6,7) counties (Figure 3). They were also historically found around Tacoma (3), and in Wahkiakum County (8) but these may all be extinct.

Habitat. Mazama pocket gophers were historically widespread and abundant on the glacial outwash prairies of the southern Puget Sound region; and they also occur on subalpine meadows of the Olympic Mountains (Dalquest 1948). While they are most commonly found in areas with sandy or gravelly loam soils on land that historically was prairie; they will move into sites with well drained soil where forest cover has been removed, including recent clearcuts. This has most frequently been observed in Mason County. They are otherwise essentially absent from forest habitats in Washington. Mazama pocket gophers occur in woodland in Oregon, particularly in ponderosa pine communities, but they are absent from dense forest (Verts and Carraway 1999). Gophers also are rare where grassland has been taken over by dense Scotch broom (Steinberg 1996, Olson 2011b). Mazama pocket gophers do not appear to require high quality prairie, but can live in a wide range of grasslands, particularly if they include a significant component of forbs, such as clover, lupines, dandelions, false dandelions, and camas. In addition to remnant prairies, occupied sites in Washington include grassy fields at airports, pastures, fields, and Christmas tree farms. *T. m. melanops* is found in open parkland and subalpine meadows in the Olympic Mountains (Johnson and Cassidy 1997).

The distribution and abundance of pocket gophers are greatly affected by soils. Soil characteristics that affect gophers include depth and texture, particularly rock and clay content that affects burrowing ability, permeability that can result in periodic flooding of burrows, and water-holding capacity and fertility that affect growth of plant foods. In general, pocket gophers prefer deep, light-textured, well-drained soils, and do not occur in peat or heavy clay soils (Chase et al. 1982, Baker et al. 2003). The distribution of Mazama pocket gophers appears correlated with prairie soil types, but they are not found on all remnant prairie sites. They rarely occur where soil is very rocky (Steinberg and Heller 1997, Olson 2011b). There are local populations in non-prairie loam, sandy, and gravelly soil types (e.g., Indianola loamy sand, Grove, Everett) that may have been unused by gophers historically due to forest cover. These occurrences often are adjacent to more typical prairie soils (e.g., Nisqually soils). They may be able to

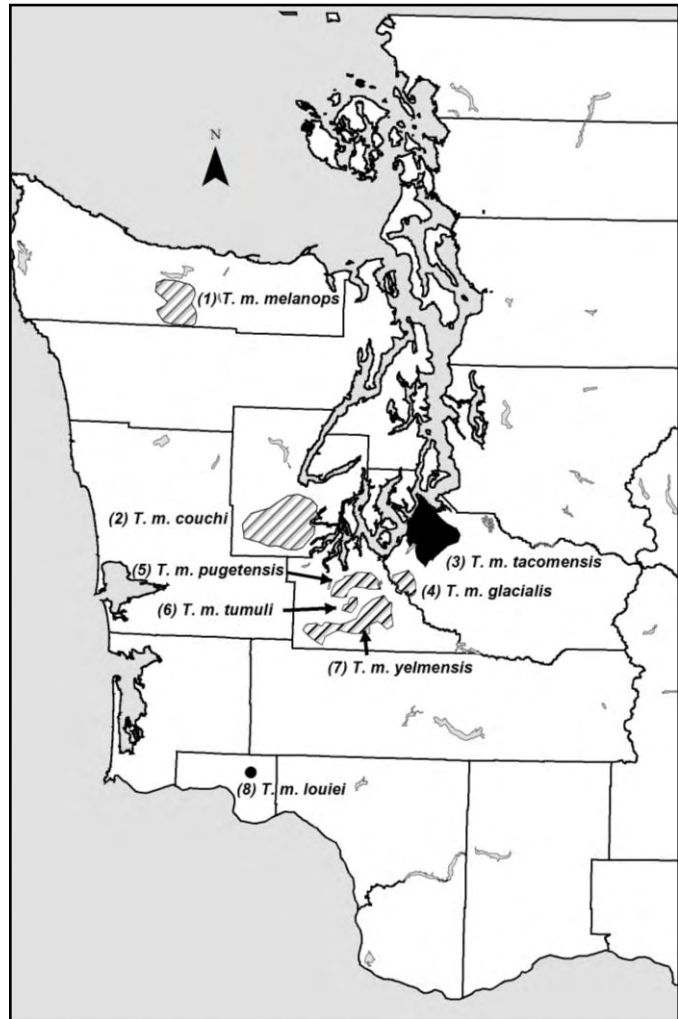


Figure 3. Ranges of 6 extant (diagonal lines) and 2 extinct (black) subspecies of *T. mazama* in Washington (Hall 1981).

occupy any site that supports herbaceous vegetation, does not have significant tree cover, and is well-drained sandy, loamy, or gravelly soil. *T. mazama* in Washington have not been found in clay, and there are few records in silt soils. In summary, deep well-drained, sandy loam or loamy sand with sufficient fertility and water holding capacity to support desired forbs appears to provide optimal habitat (Baker et al. 2003).

Population status. There are perhaps 3 or 4 large Mazama pocket gopher populations (i.e., 1,000s) in the Thurston and Pierce County area. The Olympia Airport and surrounding Tumwater area is located on the best soil type for gophers, and probably contains the largest remaining population. The largest populations appear to be found on the Olympia and Shelton Airports, Scatter Creek Wildlife Area, and Joint Base Lewis McChord. Many surviving *T. mazama* subpopulations are small (<50) and appear to be isolated from other subpopulations, although there are few data on dispersal to help delineate genetically connected populations.

There has been an increased survey effort in recent years to minimize impacts of development and to inform recovery planning. In 2011, WDFW staff revisited nearly all the historical locations of gophers in Tacoma and Dupont in Pierce County; there was little or no habitat remaining at many sites, and no sign of gophers. Gopher presence was confirmed with live-trapping at a few previously unreported sites in Mason County in fall 2011. cursory observations suggested that gophers may still exist at some historical sites in the county where they were thought extirpated. In 2012, WDFW conducted extensive Mazama pocket gopher surveys with 784 plots in Thurston, Mason, Pierce, and parts of Lewis and Grays

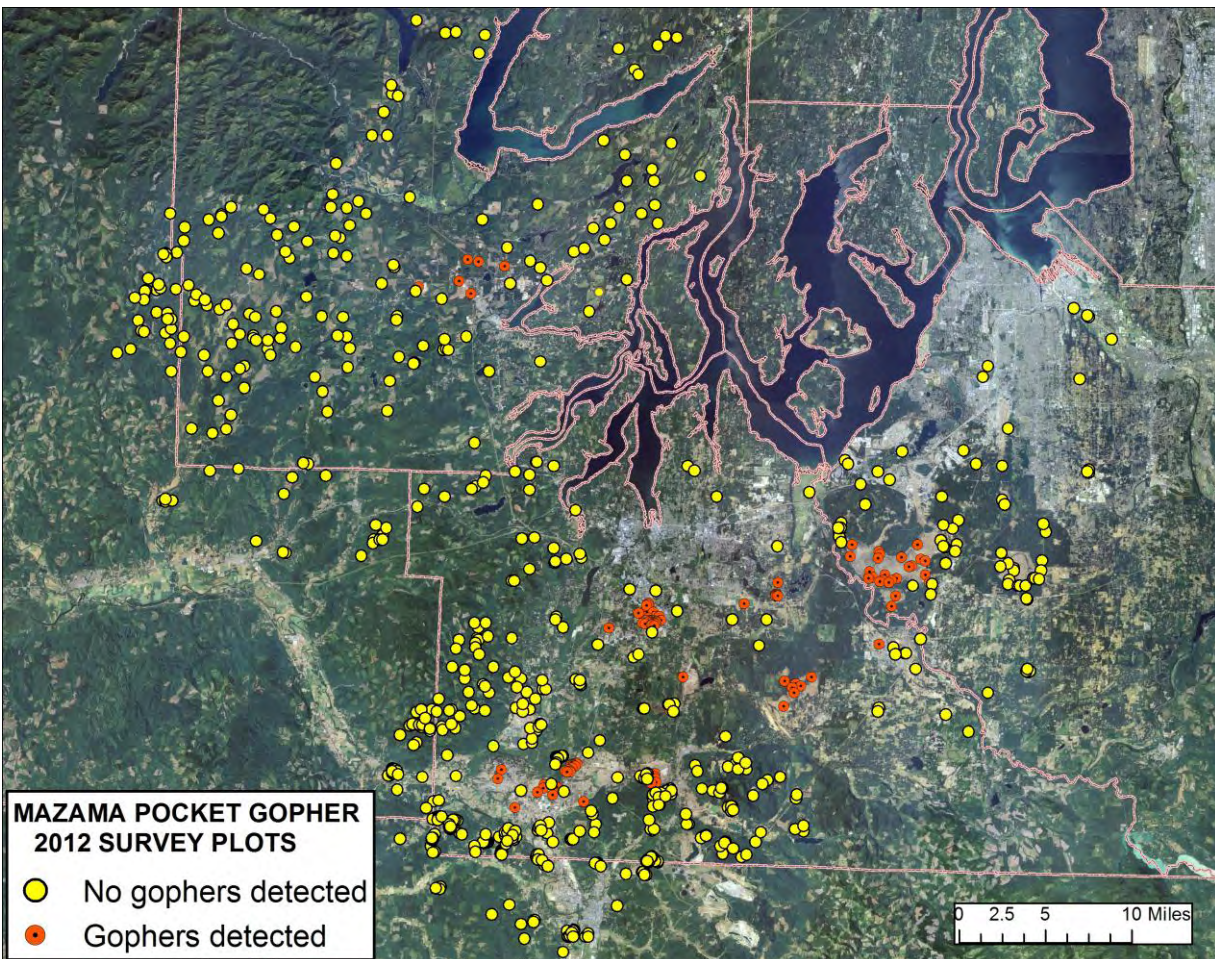


Figure 4. Plots sampled for Mazama pocket gophers in the south Puget Sound region, 2012.

Harbor counties, and ~150 supplemental site visits in these counties as well as Wahkiakum and Clark counties. Historical sites were also revisited in Clallam County. The survey results (Figure 4) confirmed previous descriptions of the distribution of *Mazama* pocket gophers in Washington as summarized in Stinson (2005).

Threats/reason for decline. Although significant areas remain in grassland, substantial portions of the *Mazama* pocket gopher habitat in the south Puget Sound have been lost to development, agriculture, and succession to forest, and what remains continues to be degraded by invasion of Scotch broom and other non-native plants. Residential development that becomes high density has been particularly destructive to prairie habitat, and probably led to extinction of *T. m. tacomensis*. Though *Mazama* pocket gophers are generally protected in recent years by state, county, and local regulation, development may result in some unavoidable habitat loss and additional fragmentation and isolation of habitat patches. Pocket gophers may not persist in high density residential areas due to effects of frequent mowing, herbicides, impervious surfaces, and perhaps elevated mortality rates resulting from predation by cats and dogs and trapping or poisoning intended for moles. These degraded sites may often represent habitat that can support young that have dispersed, but offer inadequate food to consistently support reproduction. Most occupied habitat on public lands is affected by non-conservation uses including military training and recreation. Gopher populations at airports can be affected by development of airport-related facilities and businesses and management of the vegetation around airport runways and taxiways. Gopher populations benefit from mowing at airports and prescribed burns at Joint Base Lewis-McChord which prevents invasion of the extensive grassland by woody vegetation.

Research projects. A pilot translocation project, initiated in 2005, appears to have succeeded in establishing a population on mounded prairie at Wolf Haven International in Thurston County (Linders 2008). WDFW initiated a study in 2009 to evaluate the feasibility of using translocations to establish new populations of gophers (Olson 2012). Gophers were captured at Olympia Airport and released at WDFW's West Rocky Prairie Wildlife Area in Thurston County, where a small population is established. The study demonstrated that establishing a self-sustaining population is feasible, but can require a significant, multi-year effort involving release of large numbers of animals (e.g., >100 animals per year). A third WDFW study is investigating characteristics of gopher dispersal that can help evaluate the degree of connectivity and long-term viability of populations (Olson 2011a).

An occupancy modeling study completed by WDFW found that gophers were much more detectable in fall than in spring, and that gopher presence was negatively associated with Scotch broom, shrubs, and percent of visible substrate in rocks (Olson 2011b). Results will be helpful in predicting whether sites are suitable for gophers.

Habitat management. Habitat management efforts (control of shrubs such as Scotch broom, exotic grasses, and re-establishment of a diversity of native grasses and forbs) to benefit *Mazama* pocket gophers are ongoing at a number of sites, including: Scatter Creek Wildlife Area, West Rocky Prairie Wildlife Area, Wolf Haven International, and Weir and Tenalquot prairies on Joint Base Lewis-McChord.

Partners and cooperators: U.S. Fish and Wildlife Service, Joint Base Lewis-McChord, Thurston County, Center for Natural Lands Management, University of Washington, Olympic National Park, Wolf Haven International, Port of Olympia, Washington Department of Transportation.

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