Proceedings of the
FIRST MAZAMA POCKET GOPHER WORKSHOP
and
Preliminary Report on Needed Conservation Actions
(2006 – 2010)

The First Mazama Pocket Gopher Workshop
and this summary were produced collaboratively by
The Nature Conservancy and the Washington State Department of Fish and Wildlife.

The Nature Conservancy
SAVING THE LAST GREAT PLACES ON EARTH

The First Mazama Pocket Gopher workshop was held on June 15th, 2006 and was produced by The Nature Conservancy and Washington Department of Fish and Wildlife. The goals of the workshop were to communicate the latest information with regard to the current status and research needs for this animal's recovery and to facilitate cooperative actions, aid in the generation of resources and produce a preliminary recovery action summary.

The morning session included the following speakers:

- Derek Stinson, WDFW: status of the species;
- Kelly McAllister, WDFW: threats;
- Eric Beach, Green Diamond Resources: restoration efforts for the Shelton Pocket Gopher;
- Anna Schmidt, Fort Lewis: survey methodology using hair sampling;
- Corey Welch, University of Washington: evolution and genetics of Mazama pocket gopher populations.

The speakers' abstracts have been included in this summary. Following the lunch break, the afternoon session was a round table discussion of the research and actions needed for conservation of the Mazama pocket gopher.

CONTENTS

I. ATTENDEES:

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II. ABSTRACTS

Current and Historic Population Status of the Mazama Pocket Gopher
Derek Stinson, WDFW

Pocket gophers were first collected in the Puget Sound region by Suckley and Cooper in 1853 at Fort Steilacoom. George Suckley stated that they were abundant on the gravelly prairies near Nisqually. Johnson and Benson (1960) split several subspecies from *Thomomys talpoides* in western Washington and western Oregon based on large baculum size to form the species *T. mazama*. Dalquest and Scheffer (1942) proposed the hypothesis that Mima mounds were created by the digging activities of T. mazama on shallow-soiled glacial outwash plain. Alternatives proposed over the years include seismic and geo-fluvial hypotheses. If gophers created Mima mounds, then the mounds provide evidence for a somewhat wider historic distribution than is known based on specimen collections.

Between 1899 and 1950, 8 subspecies were described. Steinberg (1999) proposed that some of these subspecies should be combined within *T. m. yelmensis*, leaving 3 extant subspecies: *yelmensis*, *couchi*, and *melanops*. *T. m. louiei*, known only from the type locality in Wahkiakum County, could not be found in 1977, 1986, or 1995, and appears to be extinct. *T. m. melanops* is restricted to several alpine meadows in Olympic National Park. *T. couchi* was

found historically at several locations in Mason County. *T. m. couchi* is now known only from the vicinity of Shelton, with the largest population found at the Shelton Airport. Historic records include Lost Lake Prairie and Matlock. *T. m. tacomensis* was historically known from Tacoma and western suburbs southwest to Steilacoom, and south to Brookdale Rd. Gophers were also reportedly caught in Puyallup. Their extinction likely resulted from the loss and fragmentation of habitat by development and higher mortalities due to roads, poisoning, trapping, and pets in the suburban environment. The last known individuals are specimens that had been killed by house cats. *T. m. yelmensis* (= *yelmensis*, *glacialis*, *pugetensis*, and *tumuli*; *fide* Steinberg) is abundant at the Olympia Airport and on certain grasslands of Fort Lewis. Many smaller populations are scattered on pastures, lawns and miscellaneous grasslands in suburban and rural sites in Thurston County.

T. mazama are found on many, but not all remnant prairie sites. They may not require prairie soils, but can occupy any site with friable soil, herbaceous vegetation, and without significant tree cover. Walter Dalquest predicted in 1944 that, "The gophers of the Puget Sound area are doomed to extinction, perhaps within a century." *Thomomys mazama* was listed as threatened by WDFW in March 2006.

Evaluation of a method to determine presence of the Mazama Pocket Gopher, *Thomomys mazama*, and other fossorial mammals in the south Puget Sound, Washington based on the collection and identification of hair samples

Anna Noelle Schmidt

Inventorying and monitoring the south Puget Sound prairie species are essential to ensure their survival, as well as the survival of the prairie habitat itself. It is important to assess how species abundance and their distribution are responding to changes in habitat and management practices. To do this, one needs to first know the current distribution of the species. One such species is the Mazama (Western) pocket gopher (*Thomomys mazama*). Due to habitat loss, the distribution of *T. mazama* is unclear. To address this uncertainty, biologists need a simple method to identify the location of the pocket gopher, to begin more studies. Mound observations may provide a simple way to determine if the gopher still inhabits the prairie habitat it once occupied, however this area is often home to other fossorial mammals, including moles, which may have similar looking mounds, especially in a wet climate. Techniques for inventory of the Mazama pocket gopher must be cost-effective, non-labor intensive, and less intrusive than trapping. The goal of this study was to develop a method of hair collection to verify Mazama pocket gopher presence in the south Puget Sound. Experiments were performed to determine the best hair collection material, the best hair collection device, and a technique to collect hair directly from a pocket gopher passing through its burrow system. The best hair collection device was a block/plywood piece with double-sided Scotch clear tape affixed to it, attached to a square piece of hardware cloth. The hardware cloth rested flat on top of the soil holding the block piece which hung down into the dug out burrow runway. The device was covered with black plastic and soil. It was tested to see if when a pocket gopher ran through its runway and passed the device, the tape on the block collected hair. This device was "plugged" often with dirt, concluding that this device and technique was not successful in collecting hair from a burrow system and may be too intrusive. Examination of individual hairs using a microscope (400X magnification) from various mammals revealed unique features that were species specific. Hair examination thus can be an effective way to determine the identification of mammals in the field. Further recommendations arising from this thesis include conducting more studies to determine if modifications can be made to the hair

collecting device to make it more effective. Currently, the best method to detect the presence of the Mazama pocket gopher may be through the identification of its unique mound structure.

Threats to the Mazama Pocket Gopher
Kelly McAllister - WDFW

The Mazama pocket gopher was put on Washington's list of State Candidates in 1996. This was largely a symbolic gesture and had no legal meaning unless protection was accrued from inclusion of the species in protections provided by local government Critical Area Ordinances. In March, 2006, the species was elevated to State Threatened status and is now Protected Wildlife under state law.

The primary threats to the Mazama pocket gopher include landowner intolerance, residential and commercial development of their habitat, invasive plants and plant succession, and the vulnerabilities of small, isolated populations.

Landowner intolerance is an important threat because pocket gophers can live in yards, gardens, roadsides, pastures and many of the types of non-forested areas that are often maintained where people live and work. However, intolerance of their burrowing, pushing up soil mounds and eating plants often makes them unwanted pests. Many known pocket gopher sites are within the urban growth areas of Olympia, Tumwater, and Lacey. These gophers are in areas likely to become housing developments, parks, schools, and roads. Increasingly, their populations are isolated in smaller and smaller habitat patches making them vulnerable to extinction because their numbers are so few.

Managing gopher habitat presents a number of challenges. Invasive plants, like Scot's broom, are a threat if habitat isn't managed. In fact, moderate disturbance in the form of grazing, mowing, or fire appears to benefit gophers, perhaps by maintaining plant vigor and postponing or preventing plant senescence. There needs to be more work on the relationship between mowing, grazing, and fire and habitat suitability for gophers including consideration of plant community composition and secondary effects like soil compaction.

Relatively secure pocket gopher populations are found at Scatter Creek Wildlife Area, Fort Lewis' Rainier Training Area and the TNC Morgan Preserve, portions of Fort Lewis in Pierce County, Rocky Prairie Natural Area Preserve, the Colvin Ranch (Grassland Reserve Program enrollment), the Olympia Airport, the Shelton Airport, and Olympic National Park. There are also protected prairies that lack gophers, where they might be introduced. These include Mima Mounds Natural Area Preserve, Glacial Heritage County Park, West Rocky Prairie, and Wolf Haven.

To establish additional secure populations, new strategies for mitigating the effects of development should be considered. Small, unmanaged set asides in residential or commercial developments may not provide suitable habitat for gophers in the long term. Larger, managed lands stand a greater chance of providing for self-sustaining populations. A mitigation bank should be established which draws on impact fees from developments affecting gopher habitat. The contributions to the bank would allow purchase and management of larger habitat areas capable of supporting populations that are likely to remain viable into the distant future.

Restoration of Remnant Prairie on Sites Currently Managed for Timber Production.

ERIC BEACH, ***Green Diamond Resource Co.***

The pre-settlement environment of Shelton WA differed greatly from current conditions. The majority of the outlying area was a continuous coniferous forest. However, on dry relatively nutrient-rich sites with sunny aspects and shallow soils over recessional outwash plains, occasional patches of prairie existed. With settlement and the onset of intensive forest management, the prairie habitats decreased in size and occurrence. Currently only 5 known "fair to good" condition occurrences of oak prairie/savannah habitats remain in Washington. Those that remain are threatened by non-native species, conifer encroachment, and development. One such oak prairie habitat was found on part of the Green Diamond Resource Co Olympic tree farm. The McKewan prairie site has been replanted with conifer following timber harvest in the early 1990's. Growing conditions are such that establishment rates are poor and growth is slow. The McKewan prairie site is one of the two documented locations with a viable population of the Shelton pocket gopher subspecies of the Mazama (Western) Pocket Gopher (*Thomomys mazama*). Restoration includes removal of invasive species and plantation Douglas fir. Native vegetation; overstory (Oregon oak) and understory (native grasses and forbs) are retained and may be augmented with plantings of native species. The site will be monitored for vegetation and wildlife response. Maintenance of the prairie habitat may require ongoing active control (prescribed fire, cutting, herbicides). If the effort is a success, up to 50 ac. in the historic McKewan prairie area may be restored if an opportunity to lease the lands as mitigation sites exists.

Mitochondrial DNA and Karyotypic Differentiation of a Geographically Isolated Peninsular Population of Mazama Pocket Gophers (Thomomys mazama) in Washington

Corey Welch & Jim Kenagy, ***Burke Museum & Dept. of Biol., Univ. of Wa*****shington**

The level of divergence of contemporary populations across the geographic range of a species can be used to understand the historical biogeography of a species. Molecular analyses can be used to reveal underlying processes such as gene flow, bottlenecks, and potential isolation. The impact of Pleistocene glacial cycles has strongly shaped the current distributions of species, but many questions remain about the impact of refugia on speciation and extinction. Due to their specialized fossorial lifestyle and relationship to particular soils, pocket gophers often demonstrate significant genetic differentiation over short distances. In Washington, the Mazama pocket gopher, *Thomomys mazama*, occurs in alpine meadows of the Olympic National Park (ONP) and lowland prairie remnants of the south Puget Sound. Using maximum likelihood and TCS haplotype network analyses of 408 base pairs (bp) of the mitochondrial control region, we have identified four haplotype groupings within Washington, three associated with the Puget Sound prairie and the fourth, which is highly divergent, in the alpine ONP population. Over the full geographic range of *T. mazama* from the Olympic Peninsula of Washington to northern California, diploid (2n) chromosomal numbers are distributed in two distinct geographic groupings. The Cascade Mountains axis contains *T. mazama* with 2n = 56-58, and the coastal lowland populations range 2n = 40-46. We have karyotyped the ONP alpine population as 2n = 48, allying it with the coastal lowland populations.

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A. Conclusions for Washington Populations:

1. Olympic Peninsula Pocket Gophers (*T. mazama melanops*)
   -Unique Karyotype and Highly Divergent mtDNA
   -Nearest populations in the South Puget Sound are not closely related and Peninsula population may have colonized much earlier
   -Relatively little genetic differentiation within population implies a recent bottleneck
   -Given its highly divergent genetic status, *T. mazama melanops* might warrant consideration as a separate species

2. South Puget Sound Pocket Gophers:
   -at least 3 distinct mtDNA groups (taxonomic status of *T. m. couchi* and *T. m. yelmensis* are supported with a third unnamed subspecies present).
   -Genetic differentiation implies an older more stable population history
-Despite the recent loss of habitat, relatively high genetic diversity still present

3. Taxonomic Mis-Identification of Brush Prairie Pocket Gopher:
   -I presented preliminary genetic and skull measurement data that demonstrate the Brush Prairie Pocket Gophers, *T. talpoides douglasii (*Clark County,WA) have been taxonomically misidentified and are in fact identical to Oregon populations of *T. mazama oregonus* located across the Columbia River. Given the rules of taxonomic nomenclature, both populations should be listed as *T. mazama douglasii*.

B. General Conclusions for the Species (as a whole):
   -alpine pop(s) (OR-CA) are closely related
   -Lowland OR-WA pop(s) are closely related
   -At least 2 colonizations into WA with the Olympic Peninsula being colonized first
   -*T. mazama* is in need of taxonomic re-evalution

IV. ROUND TABLE DISCUSSION OF CONSERVATION NEEDS

A. RESEARCH

(needs listed in no particular order)

- Is the population of gophers in Clark County *T. mazama* or *T. talpoides*?
- Are gophers positively affected by disturbance? What degree, frequency, and timing of vegetation disturbance (e.g.; mowing, grazing, burning) is beneficial to gophers?

- How far do *T. mazama* disperse and what distance to another population means a population is effectively isolated? *Corey Welch from UW/Burke museum has access to 7 micro-satellites for T. mazama developed by Ellie Steinberg that could be used for study of dispersal, etc..*

- How many genetic groups (subspecies/races can be distinguished within South Sound and how are they distributed?

- Develop and test an efficient survey protocol and monitoring scheme.

- What is the minimum patch size needed for gophers to persist in the short-medium term (20-40 years)? Minimum viable population?

- Mean survival rates of subadults and adults? Lifetime reproduction?

- What is the relationship of gopher to moles – coexistence or competition for space? Once a site is occupied by moles, can gophers kick them out? Is the presence of moles related to soil fertility?

- Baseline information is needed of soil types, depths and rock content on occupied sites versus potential sites – patterns that might help determine translocation/re-colonization sites. *The funding for this work has already been secured through a U. S. Dept of Defense Legacy grant to WDFW.*

- When are food caches used, and how can the loss of food caches during translocations be avoided or mitigated?

Lower priority research activities:

1) Do gophers aestivate?

2) Do gophers create Mima Mounds? What if we reintroduced gophers to a site with thin soil and where mounds were leveled historically. How long would it take to see some mound formation?

B. POPULATION STATUS and ACTIONS NEEDED BY SITE TABLE

(Numbers correspond to populations on attached map):

SITE		**Grass area /Owner**	**Population status and recommended conservation actions (in bold)**
1	Olympia Airport	700 acres Port of Olympia	Large pop. (2,000-7,000); portions slated for development
2	91st Division Prairie N	7,600 acres Fort Lewis	Gophers in the N & S portions of the AIA

SITE		Grass area /Owner	Population status and recommended conservation actions (in bold)
3	Rifle ranges/South Impact Area	486 ac (?) Fort Lewis	Mounds locally dense, patchy **Map distribution of gophers**
4	Marion Prairie/Training Area 18	185 acres Fort Lewis	Mounds locally dense, patchy
5	Upper Weir Prairie	547 acres Fort Lewis	Large population (Steinberg 1996a)
6	Lower Weir	440 acres Fort Lewis	Relatively large population, patchy (Steinberg 1996a)
7	South Weir	141 acres Fort Lewis	Population present
8	Johnson Prairie	221 acres Fort Lewis	Relatively large population
9	Morgan property	TNC	Gophers present **Survey distribution & abundance**
10	Scatter Creek Wildlife Area	600 acres WDFW	Population present **Survey gopher distribution on North unit**
11	West Rocky Prairie Wildlife Area	300 acres WDFW	Gophers appear to be absent **Survey for presence or absence of gophers** **Prioritize broom control sites** **Research for suitability as a site for translocation**
12	Rocky Prairie NAP	35 acres WDNR	Dead gopher (Steinberg 1996a); Gophers present (K. McAllister) **Survey for distribution & abundance**
13	Mushroom Corner	City of Lacey? and private	Gophers present at the church (River Ridge Covenant) and spilling onto adjacent property. **Survey for distribution of gophers**

SITE		Grass area /Owner	Population status and recommended conservation actions (in bold)
14	Wolf Haven	private	2005 reintroduction **Survey for survivors of translocation attempt**
15	Kelly's Corner area	private	Locations S of Pattison Lk, including Canterwood Ln and Cate Farm Dr. (K.McAllister) **Outreach and education to landowners**
16	Roy Prairie 0.5-2 mi S Roy,	private	Small population still exists (Steinberg 1996a) **Survey for presence or absence**
	Roy Prairie [McKenna Meadows]	private (small mitigation site)	Extinct? **Survey for presence or absence**
	Roy Prairie [Miles gravel pit mitigation site]	Miles Sand and Gravel	Extinct? **Survey for presence or absence**
17	Central Impact Area	Several thousand acres Fort Lewis	Gophers present **Research for suitability as a site for translocation**
18	Black River-Mima Prairie Glacial Heritage Preserve	550 ac Thurston County	No record **Research for suitability as a site for translocation**
19	Mima Mounds Natural Area Preserve	445ac WDNR	No certain record **Research for suitability as a site for translocation**
20	Rock Prairie; 2 mi SW Tenino	private	Small population (Steinberg 1996a);Present, Mima Acres Rd **Survey for presence or absence, especially Colvin property**
21	Mound Prairie [James Rd/2.5 mi SE Rochester]	private	Small pop. E and W of Scatter Crk **Survey for presence or absence**

SITE		Grass area /Owner	Population status and recommended conservation actions (in bold)
21	Mound Prairie [Prather Rd/Hwy 99, 0.3 mi N Lewis County line (1954: Grand Mound near railroad)]		**Survey for presence or absence**
21	Mound Prairie [Hwy 12 and Sargent Rd.]	private	**Survey for presence or absence**
21	Mound Prairie [Grand Mound; Prather Rd. & Hwy 99]	private	Current status unknown **Survey for presence or absence**
	Rich Rd.&Yelm Hwy, Lacey/ Hewitt Lake	private	Population present - area is being developed.
	Cross-Base Hwy mitigation site		Population present
	Hannus Rd.SE & powerline (2 ½ mi S Yelm; T16NR1ES1)	private	Current status unknown **Survey for presence or absence**
	Bush Prairie [new lane of I-5 S (WDFW data);2 collected by USDA on Kirsop Rd.]	private	Current status unknown **Survey for presence or absence**
	Bush Prairie [Lathrop Rd/93rd Av SW & Jones Rd]	WDNR, private	22 trapped at WDNR Webster tree nursery; Population present. **Survey for distribution**
	Meridian Tree Farm[d]	WDNR	WDNR seed tree farm; Small population present **Survey for abundance & distribution**
	Cavness Property	TNC	**Survey for presence or absence**

SITE		Grass area /Owner	Population status and recommended conservation actions (in bold)
	Lewis County		**Survey Toledo area for presence or absence**
	Clark County		**Survey for presence or absence** **If it is determined that there are T. mazama in areas where gophers present were thought to be T. talpoides, extensive surveying will be necessary.**
MISC HISTORIC LOCATIONS.			
	2 mi N Rochester?		**Survey for presence or absence**
	Littlerock vicinity (2 mi E Mima Prairie, E of Black River)	private	**Survey for presence or absence**
	1 and 2 mi W of Rainier	private	**Survey for presence or absence**
	7.3 mi N & 1.3 mi W Tenino[d]	private	**Survey for presence or absence**
	Vail area	private	**Survey or presence or absence**

C. Shelton Pocket Gopher (T*. mazama couchi*): POPULATION STATUS and ACTION NEEDED by site TABLE

	Population	Grass area/owner	Population status info
	Shelton Airport/Sanderson Feild (Scott's Prairie)	Port of Shelton	Geoengineers, Inc. (2003) observed mound density of 100-200/ac **State patrol training track should be checked for presence or absence** **During mitigation, portions of airport where soil was historically removed may be benefited by adding topsoil, if compatible with airport operations.**
	State penitentiary, Shelton	Dept Corrections	Mounds reported (Steinberg 1996a); Economic and Engineering Services, Inc., (G. Schirato
	McKewen Prairie	private	Few mounds both sides Brockdale Rd; McKewen Prairie Rd (Farrell and Archer 1996).re-colonized?
	Johns Prairie	private	Few mounds in heavy broom (WDFW data, Steinberg 1996a)None in recent years (G. Schirato)
	Lost Prairie	private	None found (Steinberg 1996a)
	Matlock	Site location unknown	1962 species record **Survey for presence or absence**

D. TRANSLOCATION

The consensus of the group was that there are a series of specific questions that should be answered before restoration actions such as translocation take place. Noted particularly was the research by Corey Welch that suggests that there may be as many as three separate genetic groups of *T. mazama* in South Puget Sound. It may be that one subgroup's population is doing better while one or more is more seriously threatened. Further, the genetic mixing of these groups via conservation actions like translocation should be avoided if possible to maintain their different genetic identities. Any translocation action that takes place in the interim while these answers are being sought, should take care to translocate to an isolated location where there is little to no chance for genetic intermingling. In evaluating a translocation site, the potential for natural re-colonization should be considered. Some present felt that talk of translocations may be somewhat premature. However, sites in suburbia that are unlikely to be sustained and where they are being developed the question is to allow potential 'take' to occur, or move the gophers present to another site. The sites at least provide opportunities to conduct translocation experiments to help develop methods.

The consensus was that certain actions could be taken to increase the possibilities of success in translocation. In no particular order, these actions were as follows:

- 50 individuals may be a reasonable target for capture and moving during a translocation effort.
- Site for translocations should be prepped with auger holes
- Site for translocation could be planted additional food plants if it appears necessary
- After translocation, gopher food could be supplemented to replace food caches lost by moving the animal.

Information Needs

There are numerous uncertainties involved in translocating gophers. For example:

- Should translocations take place in spring (before reproductive cycle begins) or in fall after green-up happens.

- *T. mazama* is now a listed species – what is the responsibility to surrounding landowners that might acquire a population after translocation? Certainly there will be a responsibility to notify them. Need criteria for sites to be considered for reintroductions, in terms of soil rockiness, site size, vegetation, management regime, ownership, distance to other sites, surrounding matrix.
- How many animals need to be moved to provide high likelihood of success?
- What is the best timing for translocations relative to reproduction, seasonality of food, use of food caches, etc.?
- What sort of release strategy is best? --- release after auger holes; auger holes + confinement? food supplementation?
- Identify and prioritize potential reintroduction sites.

E. HABITAT PROTECTION:

Three tasks and several questions were identified, including:

- Update database/PHS data and provide to Thurston and Pierce Counties,
- Explore the possibility of establishing a mitigation bank for Mazama pocket gopher habitat. There was discussion about the potential for using a mitigation bank to deal with pockets of gophers that still exist in suburban sites that might not be expected to persist and are slated for development.
- Prioritize occupied sites on private lands for outreach and protection based on their potential for persistence and connectivity to other sites.
- Primary questions still need to be answered, such as identifying source and sink habitats and managing core source areas. Will a core area suffice? How large a gopher population is needed to constitute a secure reserve? What is the responsibility, if any, of surrounding landowners should gophers subsequently colonize other private lands? To really explore the issue of mitigation banking, a separate "starter" meeting should be held.

F. INFORMATION & EDUCATION

Information/educational tasks and products that are needed include:

- Identify strategy and responsibility for contacting landowners where we think gophers are present and where habitat may be sufficient that they might persist (i.e. rural, low density situations).

- Develop or revise a Mazama pocket gopher fact sheet with information about gophers, non-lethal means of protecting plants (see Link's book), etc. and include information developed by the "Cats Indoors!" program.

- Outreach and education should be targeted, in particular, to private landowners with property that might provide high connectivity between occupied and potential sites. The message of outreach actions should highlight the status of the gopher as well as the possibilities for co-existence (e.g.; creative ways to protect your garden).

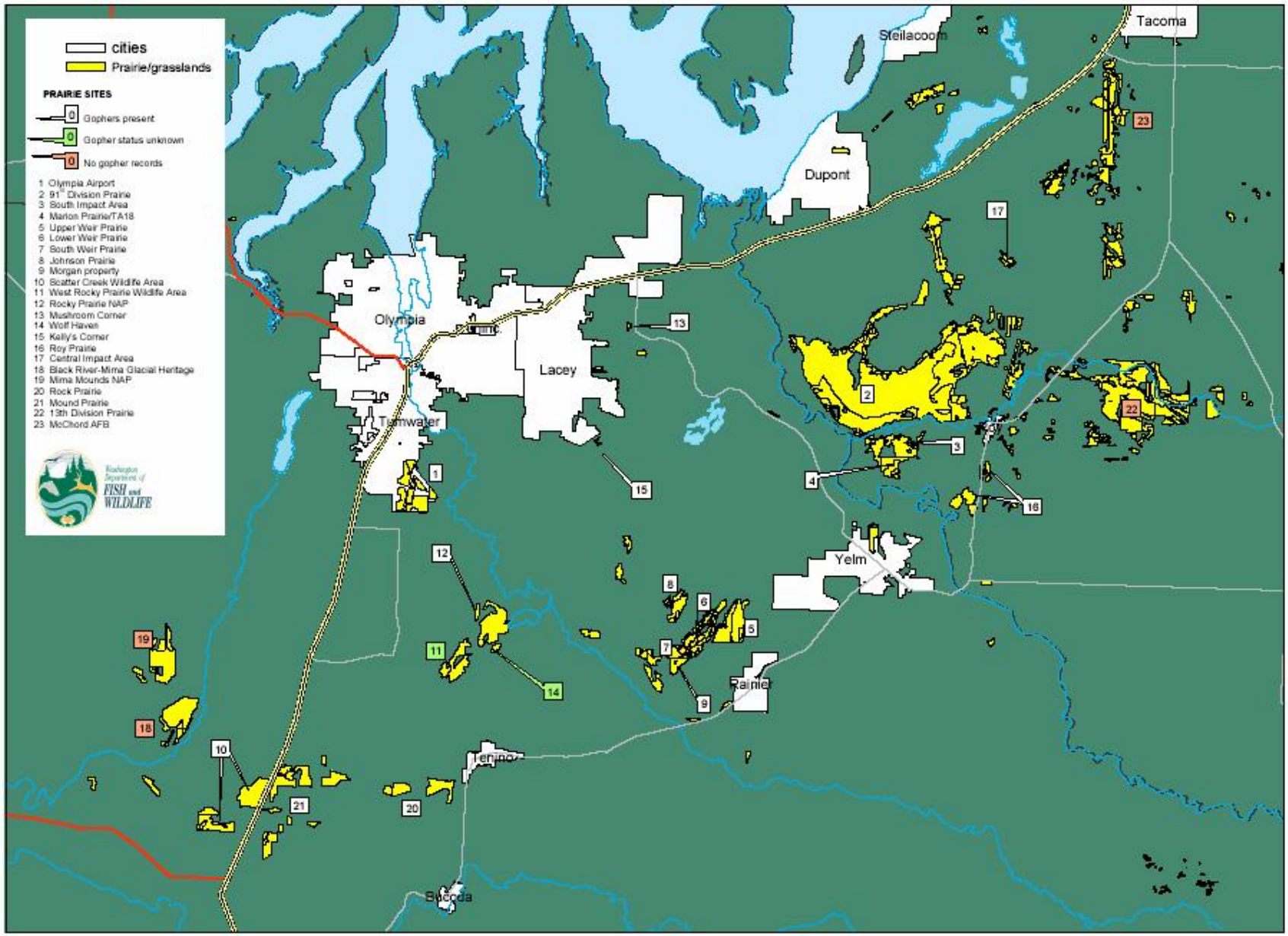
IV. APPENDIX 1. Plants that may be useful for improving grassland for Mazama pocket gopher.

Camas (*Camassia quamash*)	
Roemer's Fescue (*Festuca roemeri*)	
Lupine (*Lupinus lepidus*, *L. albicaulis*?	
Yampa (*Perideridia gairdneri*)	
Violets (*Viola adunca*)	
Blue-eyed Mary (*Collinsia parviflora*)	
Bracken (*Pteridium aquilinum*)	
	Non-natives that T. mazama eat:
Puget balsamroot (*Balsamorhiza deltoidea*)?	Clover (*Trifolium spp*)
Cut-leaf microseris (*Microseris laciniatus*)?	Dandelion (*Taraxicum officinale*)*
Agoseris?	Hairy cat's ear (*Hypochaerus radicata*)*

* these are common weeds

Gophers likely would benefit from habitat restoration that included a variety of natives, such as those listed above; however they are not very fussy and will eat many weeds, non-native grasses and forage crops if creating a site with little or no native component. Tilling probably should not be done where gophers are already present.

The map below of the South Sound Area was used during the Mazama Pocket Gopher Workshop and clearly shows currently known populations. The numbers on the conservation action table correspond to populations shown on this map.


cities
Prairie/grasslands
PRAIRIE SITES
Gophers present
Gopher status unknown
No gopher records
1 Olympia Airport
2 91st Division Prairie
3 South Impact Area
4 Marion Prairie/TA18
5 Upper Weir Prairie
6 Lower Weir Prairie
7 South Weir Prairie
8 Johnson Prairie
9 Morgan property
10 Scatter Creek Wildlife Area
11 West Rocky Prairie Wildlife Area
12 Rocky Prairie NAP
13 Mushroom Corner
14 Wolf Haven
15 Kelly's Corner
16 Roy Prairie
17 Central Impact Area
18 Black River-Mima Glacial Heritage
19 Mima Mounds NAP
20 Rock Prairie
21 Mound Prairie
22 13th Division Prairie
23 McChord AFB
Washington Department of FISH and WILDLIFE
Steilacoom
Tacoma
Dupont
Olympia
Lacey
Tumwater
Yelm
Rainier
Tenino
Bucoda