



Department of Defense Legacy Resource Management Program

Legacy 09-213

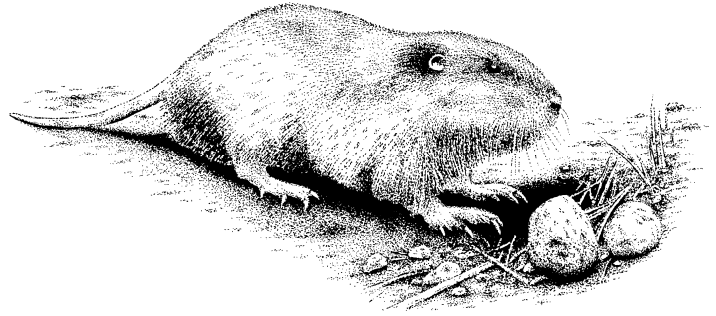
Strategy for the Cooperative Recovery of Rare Species Affecting Training Ranges:

Mazama Pocket Gopher: 2009 Workshop Proceedings & 2010 Working Group Meeting Minutes

The Nature Conservancy of Washington

March 2011

**MAZAMA POCKET
GOPHER WORKSHOP
2009**



Tumwater Conference Center, Correctional Industries & Dept. of
Natural Resources, Washington State Light Industrial Park
801 88th Ave SE
Tumwater, Washington 98512

Tuesday, February 10, 2009



MAZAMA POCKET GOPHER WORKSHOP
 Tumwater Conference Center, Washington
 Tuesday, February 10, 2009
AGENDA

8:30 – 8:40	Greetings, Welcome & Purpose	Hannah Anderson
8:40 – 8:55	Pocket Gophers 101	Kim Flotlin
8:55 – 9:10	Federal Status of the Mazama Pocket Gopher	Kim Flotlin
9:10 – 9:25	Washington Conservation Status	Michelle Tirhi
9:25 – 9:55	Genetic assessment of the status of populations across the range of <i>Thomomys mazama</i> and recommendations for the future	Corey Welch
9:55 – 10:05	Mazama Pocket Gopher Distribution: Then & Now	Derek Stinson

10:05 – 10:20 *BREAK*

10:20 – 10:50	Land Development	Michelle Tirhi
10:50 – 11:10	South Puget Sound Reserve Design Model for Three Candidate Species	Jodi Bush
11:10 – 11:40	Assessing the Distribution and Abundance of the Mazama Pocket Gopher	Gail Olson
11:40 – 12:00	Mazama Pocket Gopher Translocation in South Puget Sound, Washington	Mary Linders

12:00 – 12:45 *LUNCH*

12:45 – 1:00	What is an Action Plan?	Hannah Anderson
1:00 – 2:30	Action Plan Discussion	
2:30 – 2:50	Return, Review Discussion	
2:50 -3:00	Assemble for Field Trip	
3:00 – 5:00	Field Trip – Olympia Airport & Wolf Haven	

Presentation Descriptions & Speaker Biographies

Welcome & Introduction

Hannah Anderson

Hannah Anderson is the Rare Species Project Manager with The Nature Conservancy of Washington, South Puget Sound Program. She holds a Master's degree in Environmental Studies. Her thesis work focused on the streaked horned lark, examining the effects of internal edge and Scotch broom on nest predation. Hannah's work with The Nature Conservancy is aimed at promoting the regional recovery of federal candidate species occurring on the grasslands of the Willamette Valley / Puget Trough / Georgia Basin ecoregion. Her project promotes this agenda by working beyond political and geographic barriers and with all organizations and individuals who can assist in the recovery process. This regional cooperative approach provides the best chance for proactive, successful conservation, restoration, and recovery of target species and habitats.

Pocket Gophers 101

Kim Flotlin

Mazama Pocket Gophers are one of the smaller pocket gophers. They are built for a life underground from their small eyes to their long, strong claws, to their nearly hairless tails. Their cheek pouches are like your pants pockets, and can be emptied in the same manner. Living on glacial outwash prairies, Mazama pocket gophers eat plant parts but don't need open water to survive. They only live a year or two, and are strongly solitary except during the breeding season. The number of pocket gophers you will find per acre will depend on the amount of food they can find, which is limited largely by soil type. Many native predators depend on pocket gophers as part of their menu, and a variety of reptiles, amphibians, and insects rely on pocket gopher tunnels for escape routes. Pet dogs and cats, however, also eat pocket gophers, and are one source of their decline. Pocket gophers amend the soil in a way similar to worms, aerating and fertilizing it, and helping to maintain prairie plant diversity.

Federal Status of the Mazama Pocket Gopher

Kim Flotlin

Mazama pocket gophers are a federal "candidate" species with a Listing Priority Number of 3. In this talk, learn how they received that status and Number, what they mean, and how likely Mazama pocket gophers are to be federally listed in the future. Population status and ongoing conservation actions are integral parts of determining the timeline and likelihood of future listing.

Kim Flotlin received her B.S. in Wildlife Biology from Washington State University in 1985. Now Kim is a wildlife biologist at the U.S. Fish and Wildlife Service (USFWS) in Lacey, Washington where she has worked since 1991. Her work history with the USFWS has included years working on a variety of endangered species, but largely focusing on spotted owls and marbled murrelets. Kim has spent much of her USFWS career conducting Endangered Species Act "section 7" consultations with federal and state agencies, tribes, non-profit organizations, and private landowners. Based out of the Listing and Recovery Division, Kim currently works on candidate species assessments and conservation projects, listed species recovery projects, and providing technical assistance for multiple listed, candidate, and sensitive species in Washington.

Washington Conservation Status

Michelle Tirhi

In 1990, the Washington Fish and Wildlife Commission adopted procedures for listing species within the state of Washington. The purpose of this code was to identify and classify native wildlife species that have need of protection and/or management to ensure their survival as free-ranging populations in Washington. Furthermore, the code defines the process by which listing, management, recovery, and delisting of a species can be achieved. These rules were established to ensure that consistent procedures and criteria are followed when classifying wildlife as endangered, threatened or sensitive. Thru the state requirements dictated by the code, Mazama Pocket Gopher (*Thomomys mazama*) have been reclassified from a non-protected species prior to 1991 to a threatened species beginning in 2005. The Washington Department of Fish and Wildlife continues to collaborate with various public and non-governmental agencies on the development of a state recovery plan. In the interim, the Department provides technical assistance, permit review and collaboration thru its role as a consultant to the various local jurisdictions.

Michelle Tirhi earned her Bachelor of Science degree in Wildlife Management from Washington State University completing post graduate work at Brookhaven National Laboratory in Upton, New York on Lyme Disease in deer. Michelle completed graduate courses at University of Washington on Canadian Lynx. From 1997 to 2006, she was the WDFW Urban Biologist for the South Puget Sound region and in 2007, assumed the District Biologist position for Pierce and Thurston Counties. Her duties include conducting biological surveys and inventory, working with cities and counties on wildlife regulatory issues, and conducting public wildlife education and outreach. Her night job consists of a daughter (age 10), son (age 8), and husband.

Genetic assessment of the status of populations across the range of *Thomomys mazama* and recommendations for the future

Corey Welch

Examination of contemporary population genetic structure provides a powerful tool for identification and evaluation of the conservation status of threatened and endangered populations and species. We present genetic data from 11 of the 13 extant subspecies of the Mazama pocket gopher, *Thomomys mazama*, from across the species range. The Mazama pocket gopher is listed as threatened in Washington State and conservation plans are ongoing in regards to the health and status of the six extant subspecies. Examination of genetic distinctions among these six extant subspecies is reported here. Recommendations: 1) We recommend that population estimates of Olympic Peninsula *T. m. melanops* be initiated, 2) We also recommend two additional genetic analyses for the remaining south Puget Sound populations, 3) We recommend karyotyping, obtaining morphological measurements (skull and baculum), and mtDNA sequencing of ~10 individuals of the Brush Prairie pocket gopher, *T. talpoides douglasi* from Clark County to resolve the species identity of this population.

Corey Welch completed a PhD from the University of Washington in 2008. He is currently an IRACDA Post-doctoral Fellow at the University of Kansas. Dr. Welch's research fits under the broad category of biogeography and evolution, and he employs field and molecular methods to explore patterns and causes of geographic variation of mammalian populations and species from the Pacific Northwest of North America. Dr. Welch will be working at the KU Natural History Museum to understand the recent evolutionary histories of shrew-moles, western moles, and the mazama pocket gopher. Originally from Montana and a member of the Northern Cheyenne tribe, Dr. Welch is committed to training the next generation of Native American scientists.

Mazama Pocket Gopher Distribution: Then & Now

Derek Stinson

Mazama pocket gophers (*Thomomys mazama*) were historically widespread and abundant on the glacial outwash prairies of the southern Puget Sound region, as well as on subalpine meadows of the Olympic Mountains and grasslands south of glacial outwash. Several populations were sufficiently distinct to be described as separate subspecies, particularly those that were geographically isolated. The prehistoric distribution and origins of the various subspecies is rather poorly understood, and differences in chromosome number between some of the subspecies, both in Washington and Oregon, suggest that further genetic research may result in a split of the taxa into 2 or more species. Gophers now seem to be occurring in soil types that were historically unused due to forest cover. The glacial outwash prairies were maintained by Native American burning during the last 4,000 years. Douglas-fir establishment with the cessation of burning in the past 100 years, has made some historic prairie unsuitable for gophers, while forest clearing and draining seems to have created new habitat. It is unknown if there are any reasons why gophers cannot persist in formerly forested loamy or sandy soils if maintained as grassland. These changes seem to have made predicting the occurrence of gophers problematic.

Derek Stinson wrote the 2005 state status report for the Mazama pocket gopher. He has worked on wildlife species conservation for 20 years, including 4 years in the Mariana Islands, 2 years working on forest issues for the Yakama Nation and WDFW, and the last 9 in the Threatened and Endangered Species Section in the Wildlife Program of WDFW. He has a BS from Framingham State College and an MS from WSU.

BREAK

Land Development

Michelle Tirhi

Since the reclassification of Mazama Pocket Gophers in 2005 to state threatened, the Washington Department of Fish and Wildlife has been working towards improving surveys and management of gophers both on public and private lands. Regional staff sought to design a standardized survey protocol that could be applied across all prairie soils potentially supporting remnant gopher populations. The information contained from such surveys would be used to complete site management plans in a format readily recognizable to jurisdictions and developers. The system has been in practice since 2007 and has involved the review of approximately 70 project locations in Pierce and Thurston County.

South Puget Sound Reserve Design Model for Three Candidate Species

Jodi Bush

Several Washington state-listed, Federal Candidate species and subspecies exist in a rare remnant prairie ecosystem in the South Puget Sound region. In the face of continuing development in this region, identification of a set of prairie patches to be protected and managed for the species and subspecies that rely on this ecosystem, is necessary for protecting these entities into the future. The USFWS Washington Fish and Wildlife Office is constructing an optimal reserve design taking into account both biological objectives and economic feasibility objectives. Target biological entities include streaked horned lark (*Eremophila alpestris strigata*), Taylor's checkerspot (*Euphydryas editha taylori*), and Mazama pocket gopher (*Thomomys mazama yelmensis*, *T. m. couchi*). Additionally, though perhaps not explicitly stated, objectives are to maintain flexibility in the reserve design and to limit restoration costs.

Ms. Bush has nearly twenty-five years of experience working with Endangered Species, including a decade with the U.S. Forest Service throughout the west. For most of her career she has been involved with Endangered Species issues, working with the spotted owl, marbled murrelet, gray wolf, bull trout, bald eagle, and grizzly bear. Currently, Ms. Bush supervises the Endangered Species staff in listing and recovery in the U.S. Fish & Wildlife Service, Washington Fish and Wildlife Office. Previously, Ms. Bush worked for the FWS as a Deputy Field Supervisor in Cheyenne, Wyoming, and as the Supervisor of the Wenatchee suboffice located in Wenatchee, Washington. Throughout her career, Ms. Bush has made it a priority to work with state, federal and NGO partners to achieve conservation and recovery of listed and candidate species.

Assessing the Distribution and Abundance of the Mazama Pocket Gopher

Gail Olson

The main objective of this ACUB study was to develop an occupancy model for the Mazama pocket gopher, using habitat characteristics to estimate the probability of occupancy of a site and to assess sites for future translocations. A secondary objective was to investigate the relationship between pocket gopher mounds and animals, to better assess the use of mound surveys to index gopher populations. This presentation describes the approaches used to meet each of these objectives, and gives preliminary results. For occupancy modeling, an approach developed by D. MacKenzie and others was used to account for imperfect detectability of pocket gopher presence due to several factors, including time of year and spatial variation within sites. A total of 41 sites, both occupied and unoccupied, were surveyed for pocket gophers and measures of several habitat factors were collected. For the mound survey study, an intensive mapping approach followed by target trapping was used to associate specific mounds with individual gophers at 2 study sites. Although the scale of the study was small, there was much variation in both the number of mounds and the amount of area associated with each gopher. The implications of these results to mound surveys are discussed.

Gail is currently a Research Scientist at the Washington Department of Fish and Wildlife (WDFW), where her primary research responsibilities are prairie wildlife species in western Washington. She is the project leader for an ACUB study on Mazama pocket gophers and the Prairie Quality Monitoring/Assessment study, jointly funded by ACUB and the Department of Defense Legacy Program. She serves as a statistical consultant and analyst on several other studies including butterfly projects for both Mardon skipper and Taylor's checkerspot aimed at developing monitoring methods based on Distance sampling. Gail has a PhD. in Wildlife Biology from Colorado State University, an M.S. in Ecology (with Statistics minor) from North Carolina State University, and a B.S. in Zoology from the University of Rhode Island. Before being hired by WDFW, she was a Research Assistant Professor at Oregon State University, where her main research projects were on population dynamics of Northern Spotted Owls.

Mazama Pocket Gopher (*Thomomys Mazama*) Translocation in South Puget Sound, Washington

Mary Linders

Loss of suitable habitat to human development, agriculture and fragmentation, as well as degradation caused by heavy grazing, Scotch broom invasion and forest succession are all contributing factors in the decline of Mazama pocket gopher, *Thomomys mazama*, a regional endemic found only in western Washington, western Oregon and northern California. A fossorial mammal, gophers favor fine-textured soils in South Puget Sound, Washington, which are often associated with current or former prairies. They forage for succulent plant roots and shoots in shallow tunnels, churning the soil and leaving behind tell-tale fan-shaped mounds. Prairie soils are exceptionally well drained and have always been valued for human settlement. Recent shifts in population growth and real estate markets, however, have placed added pressure on sites occupied by Mazama pocket gopher, since they are prime locations for development. Prior to listing as a state-threatened species in 2005 (Stinson 2005), set asides were required on some properties in an effort to protect resident gophers; however their small size and isolated location often lead to population loss. The Washington Department of Fish and Wildlife will not authorize the movement of pocket gophers, since methods for successful translocation have not been thoroughly tested. This pilot project is a first attempt at developing translocation methods for Mazama pocket gopher and is the spring board for a larger, more rigorous study proposal. Between 2005 and 2008, over 200 Mazama pocket gophers were moved to a 38-acre mounded prairie site at Wolf Haven International, near Tenino, Washington. This release site was chosen because it contains intact prairie in a protected status, and is located near a historically occupied Mazama pocket gopher site with no recent evidence of gophers. Periodic trapping and surveys to document surface mounding at the release area indicate that gophers have persisted at the site in relatively low numbers; indications of reproduction were also reported in spring 2008. Where appropriate, the strategy of moving gophers to secure conservation sites could contribute to long-term recovery while improving ecosystem function at sites currently unoccupied by Mazama pocket gopher.

Mary Linders is an endangered species recovery biologist for the Washington Department of Fish and Wildlife (WDFW) on a joint assignment with Fort Lewis Military Installation. She works on restoration and recovery of 5 prairie and oak woodland-associated species in South Puget Sound including Taylor's checkerspot and mardon skipper butterflies, streaked horned lark, Mazama pocket gopher and western gray squirrel. Mary has worked for WDFW since 1994 on projects related to the conservation of rare species. She received a master's degree in Wildlife Science from the University of Washington in 2000 and a bachelor's degree in Anthropology from the University of Wisconsin-Madison in 1987.

LUNCH

What is an Action Plan?

Hannah Anderson

Wildlife Actions Plans are collaboratively created plans designed to strategically prioritize needed recovery actions as well as direct funding and implementation of those actions. The action plans are intentionally short-term, aimed at guiding priorities in the next three to five years. The actions in the draft Mazama Pocket Gopher plan are arranged into four broad categories: Protect and Enhance Populations; Protect and Manage Habitat; Research Needs; and Partnerships, Communication, Collaboration. The full draft plan is included with the workshop materials, and the presentation will provide a brief description of actions outlined within these categories. Following the brief presentation we will have a group discussion about the plan, broken into two smaller groups for ease. Our aim will be to identify any significant gaps in the strategy, provide a forum for feedback and discussion, as well as build on the initial prioritization. Group facilitators will summarize and present to the entire workshop at the end of the discussion period.

Field Trip

The field trip to the Olympia Airport and Wolf Haven International is intended to show two distinctly different areas inhabited by Mazama pocket gophers. The Airport has a long history of consistent occupancy by pocket gophers, and apparently serves as a source population for surrounding areas. The Airport is made up entirely of Nisqually soil, a deep sandy loam that appears to be ideally suited for pocket gophers. Wolf Haven, on the other hand, has a recently established population of pocket gophers in mounded prairie soils that are especially rocky, and it may be isolated from other pocket gopher populations. Thus the probability of long-term persistence of gophers at this site is unknown. Gail Olson will lead the field trip and answer questions about research conducted on both sites, Mary Linders will answer questions about translocation efforts at Wolf Haven, and Tammy Schmidt will demonstrate pocket gopher trapping techniques at the airport.

**Minutes of Mazama Pocket Gopher Regional Working Group Meeting
Thursday October 28, 2010**

Executive Summary

The purpose of the meeting was to assemble people involved in Mazama pocket gopher conservation to learn about current conservation efforts, research and regulatory action affecting the gopher.

Key points:

- First draft of State Recovery Plan for the gopher is expected around spring 2011.
- Gopher research re occupancy modeling, translocation and dispersal is ongoing; however much more remains to be learned.
- County development approval process regarding gophers presents challenges, especially for single family residential parcels. Set-asides can amount to a large portion of the parcel.
- There is no mechanism for ongoing monitoring of set-asides.
- Public education needed on the fact that only a small proportion of sites with prairie soils have a positive finding for gophers.
- Strategies for improving public perception of gophers discussed. Could make a video or fact sheets about gophers.
- Potential subgroups for working group identified.

ACTION ITEMS

- Jodi Bush will contact videographer re video on gopher
- Hannah Anderson will develop subgroups and contact potential participants
- Michelle Tirhi will assist with subgroup development

Discussion

1. Gopher Recovery Planning

a. Review of Gopher Action Plan – Hannah Anderson, TNC

- Will not do a full review of Gopher Action Plan today. Not enough has changed since last year, and would be more efficient to do in a smaller group. The Action Plan is distinct from a general recovery plan, as it is a shorter term, more focused document.
- Will look to break into smaller groups to address specific areas, including Gopher Action Plan. Smaller groups will report back to general working group on their progress.

b. WA State Recovery Plan Production - Derek Stinson, WDFW

- State Recovery Plans are a tool for WDFW staff. Not a regulatory document. Is a technical document.
- WAC 232-12-297 outlines requirements for State Recovery Plans.
- Plans include natural history, population status, habitat status, factors affecting continued existence, recovery and implementation schedule (cost estimate).
- Review process includes internal and external review, as well as public comment period.
- Gopher is a federal candidate species, so WDFW intends to do a plan that meets both state and federal criteria for recovery plans. Listed in WA in March 2006.
- Need to have recovery plan done within 5 years of listing, but usually don't meet that timeline.
- About every 5 years need to provide update to WA Fish & Wildlife Commission.
- Eventually would like to have all status reports online, and updated annually.
- Action Plan is useful as a tool. Timeline shorter and more specific. Helps prioritize actions when writing recovery plans. Recovery plans are more strategic and general.
- Might have a first draft of gopher recovery plan by March 2011.
- [Mary Linders:] The Recovery Plan is primarily a document to guide our own actions. It probably won't change the regulatory landscape or have an impact on development applications.

2. Gopher Research Update - Gail Olson, WDFW

a. Occupancy Modeling

- Field work completed 2008.
- Goal: Develop a model to assess probability of gopher occupancy based on habitat covariates, and to develop model for multi-scale occupancy.
- Measured: mound presence, % grass cover, % shrub and forb cover, vegetation height, tree presence, % soil (% of soil, gravel, coarse gravel, and cobble), tree presence. All based on ocular estimates; not particularly precise.
- Results: Timing of survey really matters. Gophers are much more detectable in fall than in spring. So need to survey in fall if want to identify occupancy.
- Site occupancy: % soil had positive association. More soil vs rock means more gophers.
- Scots broom cover and fall vegetation height were negatively associated with gopher.
- Within sites, plot use has more factors that are relevant.
- For plot use, % soil and fall vegetation height were positively associated.
- For plot use, negative associations are Scots broom, % coarse gravel and % shrub cover.

- Pocket gophers appear to avoid the most overgrown (highest vegetation) sites. Within occupied sites, appear to use the taller rather than shorter grass.
- Spring vegetation height didn't seem to factor in as much, but nothing is very tall in the spring.
- Plots were 25x25m.

b. Translocation Study

- In process
- Goal: Determine feasibility of using translocations to establish new populations of gophers, including estimating short-term survival and site-fidelity, and longer-term survival.
- Donor site was Olympia Airport; release site was WDFW's West Rocky Wildlife Area (in Thurston County, near Millersylvania State Park).
- Trapped, PIT-tagged and released 200 individuals. Aimed to radio collar 55 individuals. Tracked signals for minimum of 30 days, then followed up.
- 2009 results: 210 animals released; 68 radio-collared.
- First 51 radio collared animals died (99%) or lost collars within 3 days of release.
- Of final 17 releases, 7 survived at least 40 days and 6 were alive in early January when signals failed.
- In spring 2010 did follow-up trapping. Found 18 individuals alive – 8.6% of those released. 4 males, 13 females, 1 unknown. Don't know sex ratio of those released because very difficult to sex pocket gophers in the fall.
- Don't know mortality rate of the donor population.
- Causes of mortality were mostly predation, including raptors.
- 2010 results: This fall released 200 animals, radio-collared 63. 25 radioed animals alive as of 10-26-10.
- Why more success this year: changed release strategy. In 2009, based on the only previous release at Wolf Haven, they put into pre-augered holes, given carrot, hole plugged, crate placed over hole. Generally came out of holes and ran away and exposed themselves to predators.
- For final 17 releases in 2009, tried various methods. Had best luck with an anchored enclosure (so couldn't slip under and escape) and providing extra food beyond carrot.
- For 2010, buried edges of cages 6" deep, requiring gopher to dig a tunnel to get out. Put in food, including carrots and alfalfa.
- Also tried releasing into abandoned mole tunnels, then covering them up.
- Could try full fencing with roof netting around a plot, but hoping to avoid something that extensive or expensive.
- Size of release area: around 30-40 acres.
- Gophers usually never come above ground. Underground they're pretty safe from main predators of raptors and coyotes. Better results this year is because it was harder for them to come up straight away.
- We're not mimicking anything in the gopher world by doing translocations. With any translocations, natural response is to flee. If weren't as successful this year, may need to spend more effort per gopher, e.g. completely enclosed boxes and feeding them for up to a week.
- We're dealing with a small mammal that's a prey item. Had to accept that we would have losses. That's a reason we took so many of them. Alternative was to invest a lot of time and effort into each individual.
- [Mary Linders:] We don't know mortality rates in the wild, but it's relatively high compared to

other species.

- Trying to develop a conservation strategy to increase survival as a whole. Would be better not to translocate, but if it's required for maintaining pocket gophers in this area, need to accept some losses.
- 94 fresh mound clusters recorded during a partial site survey on 10-22-10. Indicates that gophers have made progress in establishing translocation.
- Hold judgment until spring. La Nina winter coming. No food caches in new area like in old area.
- No good way to supplement food for winter. Gophers block all access to tunnel systems. Don't want to increase mice or vole population either by spreading around food.
- Goal is to establish population of at least 25 breeding females.
- Minimum viable population is unknown, though. Unclear minimum required to survive stresses such as drought summer, hard winter. Even beyond spring, need to be concerned about genetic diversity. Need to get numbers up to get genetic diversity.
- Unclear whether reproductions by 2009 translocations. They do seem to have spread somewhat.
- [Jim Kenagy:] One recommendation – having notion of 25 breeding females is only useful if specify an area in which want to work, so should clarify size of release site.
- Right now space isn't an issue. Release area represents less than 20% of the prairie area.
- [Mary Linders:] Fort Lewis has low density of gophers, but seems to work.
- Don't have much information on natural population densities to compare this to.
- 2009 and 2010 gophers came from airport itself. Very large population there. Been estimated at 4-6,000, so haven't seen impacts from taking 200/year.
- Re: genetic diversity of source population, would use gophers from any properties adjacent to airport, but would hesitate to add gophers from other areas because we don't know enough about genetics to put them together. That would increase genetic diversity, but don't know if that's a healthy thing or not.
- At Wolf Haven, get a few more mounds every year. Population been bolstered by repeated releases.

c. Dispersal Study

- Goal: Provide information on dispersal characteristics that could be used to determine the degree of connectivity between current populations of gophers, to evaluate long-term viability of current population, and predict effects of both additional habitat fragmentation and enhancements.
- Specific goals:
 - a. Determine dispersal distances. How far will they travel?
 - b. Identify dispersal barriers and corridors. Travel through Scots broom forest? Cross roads?
 - c. Determine fate of dispersers.
- Proposed study areas were Lower Weir and Johnson Prairies on JBLM, because had consistent populations of gophers.
- Enough corridors and barriers in proximity to other populations.
- Aimed to collar and track 100 juvenile gophers, then check locations for up to 90 days.
- Used only one study area. In 2.5 months trapping, only caught 34 juveniles (of 154 total caught) and only 15 collared. Maximum number of days tracked was 33 days. Furthest movement recorded was 16m.

The Problems

- Trap mortalities, especially nursing females and juveniles. Overnight trapping gave a lot of problems with mortality, so ceased that. Reduced trapping effort by over half.
- Low rate of juvenile captures. Targeted areas where caught reproductive females, and tried to catch juveniles some time later.
- High rate of radio-collar injuries – far more than in translocations.
- Other mortalities (dead in burrows).

Why?

- Bad weather. Think that led to late and extended reproductive season (still pregnant gophers in July).
- Poor reproductive season. Expected average litter size of 5. Should have had a lot more juveniles, given number of females caught.
- Young juveniles weren't able to handle radio collars. Not sure why – skin more sensitive? Don't think weight of radio collar was an issue.
- Had issues with radio collar construction. Not as happy with them this year, but can't prove. Shape is a little different.
- Have inadequate life history data. Literature suggesting average litter size of 5 is quite old. Same literature suggests dispersal in May, but was still happening in July.
- Poor assumptions based on inadequate data.

How to fix?

- Move field season to fall. Juveniles larger and older. No major problems in translocation study. More likely to observe longer movements.
- Personal observation is that you see mounds in more different areas in fall.
- But if you start doing that in fall, you don't know where they came from. Idea in summer was to get them where they were born, or close to it.
- Therefore need to use genetics to assign a point of origin. If do enough trapping of the population as a whole, can make pretty good assumption about where the mother is located.
- Genetic info can also have multiple other benefits.
- Use same radio collar manufacturer as for translocation study.

3. Private Property Review Process - Michelle Tirhi, WDFW

- Pre-2006 gopher listing, had general guidelines on how to study.
- In 2006 established Site Survey Protocol.
- Basic premise is that only look at sites that are positive for prairie soils. If have those soils, required to do a survey. Private consultants do the surveys. Tammy Schmidt trains and works with consultants and goes on site to validate surveys.
- Step 1: District biologist gets permit from local jurisdiction and compares location to soils maps.
- Step 2: WDFW Habitat Program contacts Wildlife Program and requires survey to be done.
- Step 3: Consultant does complete inventory of property. If large, may do via transects. Every mound positively identified as being gopher is GPSed.
- Step 4: Each mound point encircled with 10m radial buffer, and overlap between mounds is dissolved. Not trying to determine how many gophers are on property. Obligation as state

agency is to identify habitat for gophers.

- Step 5: Compute total acreage in dissolved buffers.
- Step 6: Acreage computed and multiplied by 3 to provide the final set-aside acreage. Multiply by 3 because don't have any allowances for dispersal of young, or ebb and flow of population over time, and growth of population. Policy decision to use 3:1 mitigation ratio.
- Step 7: Set aside area is manipulated to fit within development parcel. Contain majority of mounds, and exclude non-useable gopher habitat.
- Step 8: Finalize into Habitat Management Plan, with set-aside map for development planning. Send to jurisdiction.
- Occupancy can be extensive or sparse. But don't have legal right to look at adjacent sites. If later applications come in for adjacent sites hopefully can match up with existing protected areas.
- Generally only survey if development permits sought. Very few opportunistic surveys.
- Pierce County has less prairie; most is on JBLM. But County will start doing surveys soon.
- 2004-2010 did 80 surveys on private property.
- 2008, did 42 surveys; half positive for gophers and half negative.
- 2009, did 26 surveys; 15% positive and 85% negative.
- 2010, 7 surveys so far. 29% positive, 71% negative.
- Total: 36% positive for gophers, 64% negative. Important message for jurisdictions because taking a lot of public flack for what we do.
- Want to establish total acreage affected in Thurston County by set-asides (hopefully have by time notes prepared). Also want to establish how much land affected in all development permits submitted.
- There are high densities near Olympia Airport, then a vacant area, then higher densities in Rochester area.
- Single family residential landowners – maybe will have differing treatment than for large developers. But can be a cumulative effect from single family parcels being developed. Need to tackle that theme.
- [Hannah Anderson:] This group should focus on conservation of species. Goal may not be just to make private landowners happy, but how to effect that in a positive way for the species.
- WDFW has a science group that works on these issues. I'll probably be talking to them soon on the small landowner issue.
- The typical restrictions in a set-aside are permanent fencing (keep cats, dogs, livestock out); invasive plant removal and restoration with native plants; mowing; sign stating that it's a Wildlife Conservation Area. Considering whether to allow livestock grazing. Restrictions imposed in perpetuity. Recorded on title. Obligated to comply with management plan for life of permitted activity on property.
- A weakness is enforcement for long-term set-asides.
- First set-aside – still fenced and signed. Overgrown but there's still gophers there.
- Management of protected areas could be a great thing for Native Plant Society or other organization.
- [Pat Dunn:] Long term set-aside is a tough strategy for long term conservation of species.
- Goal is for developers to purchase other land with gophers for conservation, or have translocation. Doing studies to get there. Still need to work on a bank or mitigation approach that is meaningful. Mitigation has to cover full cost – land purchase, management, research.
- If population is non-existent for 5 consecutive years (and we can't find a violation for having caused that) then WDFW has obligation to reassess. Standard for most mitigation agreements.

4. Thurston County Gopher Update

a. Critical Areas Ordinance - Andrew Deffobis, Thurston County

- County updating its Critical Areas Ordinance. Required by Growth Management Act.
- One goal is to strengthen and permanently adopt prairie protections.
- Renewed interim prairie ordinance this year; hopefully take Critical Areas Ordinance to board early 2011.
- Had open houses on critical areas. Staff from USFWS, WDFW, USDA (landowner incentives), County in attendance.
- Most comments from small landowners – 5-10 acres. Mostly rural areas.
- Comments: Private property rights; set asides are takings; over-regulation. Lots of skepticism whether gopher endangered, and whether worthy of protection; gophers are resilient and will move out of way of development. “See them everywhere.” “Only have a life span over 2 years so are they worth protecting?” Questioning whether understand sub-species. Saying that small set-asides not the way to go; should look at larger picture.
- Lot of skepticism over threat of federal listing. Tried to convey message that if County doesn't regulate, federal government may list and take over.
- Misunderstanding of State guidance. Thought it was regulatory.
- Review area is 600 feet from point locations. People think it's too far. While area isn't technically a buffer, some believe it becomes one if can't afford to do surveys.
- Had a few positive comments – people shouldn't be afraid of habitat management plans. Some talked about importance of prairies. But far outweighed by negative comments.
- Want to make people aware that County is receptive to comments. Had a follow up meeting with WDFW, USFWS, consultants. County will continue to seek guidance from state and federal regulators on status of species. But also looking at how can compromise and work with landowners to impose regulations. How alleviate cost of surveys? Funding or incentives? Possibly compromise on official survey season so don't have to wait till following summer. Considering looking at 600 foot review area, and going to gopher soils map.
- Ramping up incentive programs. Looking to ramp up transfer development rights program. Currently only for agricultural lands.
- Critical areas ordinance is being reorganized, draft out soon. Then goes to Planning Commission and public hearings.
- Draft will be available on website and through Hannah Anderson. Can sign up for notification on website.
- [Michelle Tirhi:] May be looking at regulations on what is allowed in conservation area, and whether appropriate for gopher sites.
- Minutes of meetings and audio of meetings available. Posting all comments on website.

b. Implementation of Prairie Ordinance – Mike Kain, Thurston County

- Ordinance applies if gopher soils on land subject to development application.
- Threshold dropped from 5 to 1 acre for developed parcels. Threshold for vacant parcels is 0.5 acre.
- Like wetlands, in the first year, people very upset. People now generally understand, with a few exceptions, that we are protecting wetlands. Expect that similar mindset will grow for gophers.

They're upset if going to take more than 50% land in set-aside. If can keep to 50% or less, can show them how to develop property and save gophers.

- Landowners know County isn't coming back to check, unless neighbor complains.
- Also people don't like season of June 1- October 31. Hard to hear that they need to wait that long if apply near end of year. County will always go to a site first, and if there's no undisturbed soil, we can conclude there are no gophers. But if we find disturbed soil, they will need to wait till June 1 and do a survey.
- Landowners with small set-aside areas are ok with protecting the gopher.
- Hopefully will get better science to justify the minimum acreage requirements. Hopefully gopher set-asides will become norm like wetlands, steep slopes, stream set asides.
- County interested in idea of prairie mitigation bank. County owns good prairie land already. If found that translocation worked, would be a great help.
- [Cindy Wilson:] The County is considering more comprehensive planning, such as habitat conservation plan, but takes a lot of effort and time. Some grant funding comes open mid-2011.
- Cluster development may have merit. In past allowed it for critical areas. At the time, allowed a density bonus. Maybe could require clusters, rather than taking away half the property. Could allow higher density. But then would get urban-sized lots in rural area. Take it to the board early next year and see what they think.
- [Cindy Wilson:] Interim prairie ordinance has exceptions for minor street improvements. Our CAO language will also refer to allowing banking projects, even though there's no banking project protocols set up at this time.
- [Michelle Tirhi:] Road widening with DoT had issue of set-aside being good portion of the road. We calculated a cost, and put onus on DoT to find occupied or unoccupied property but haven't been able to find land at appropriate cost. Offsite mitigation has to be based in reality; is a good idea in concept.
- County code of civil infraction – had first infraction recently. Man fined after caught with dead gopher. He abandoned property after that.
- [Derek Stinson:] Dave Hayes asked me to raise this issue: he's encountered misimpression that landowners can't do anything with land inhabited by gophers. Can't mow, or walk, etc. He does a lot of restoration on land with gophers – burning, mowing etc.
- [Cindy Wilson:] People apply to develop and get a letter saying don't do ground-disturbing activities until we survey. Mowing is there as a place-holder. That could be basis of misunderstanding. Part of public education – tell people with prairie soils what they can and can't do.
- Monitor current set-asides to evaluate effectiveness. Less than 30 set-asides in total.
- Add bond requirement to set-aside permit conditions to ensure compliance.

5. Discussion Period

a. Strategies to improve the public image of the Mazama Pocket Gopher

Perception problem:

- Not a lot of completed science on gopher. No target to tell public what recovery looks like. In much of country it's legal and encouraged to kill gophers.

Possible strategies:

- Video (online (agency websites, YouTube), DVD). Possibly produced by videographer

involved with grizzly bear video, or by public broadcasting.

- Fact sheets / brochures
- Highlight gophers at Prairie Appreciation Day. 1,200 attendees in 2009. (But no gophers at Prairie Appreciation Day site.)
- Include fact sheets from WDFW with County mailout re survey requirements
- Mailouts to adjacent landowners when application submitted
- Distribute information via Webmail. But people have to sign up for it.
- Prairie component in 4th July parade
- Improve Google search results for gophers; currently top results focus on how to kill them.
- Include gopher information on WDFW website's "Living with Wildlife" page.
- Use gopher for sport team name or mascot
- Establish mazamagopher.org and put up a billboard to publicize it.
- Improve gopher section on southsoundprairies.org
- Focus permitting on prairie habitat in general rather than just gophers. Qualify consultants to survey for all aspects of prairie habitat and species.
- WDFW is developing a prairie box – materials to take to higher elementary schools in South Sound. Problem is that not a lot of info about our prairies. Will go to each school district after initial testing.
- Prairie exhibit at new Hands On Children's Museum.
- Incentivize landowners to restore to prairie for mitigation credit system. Been some funding to assist landowner to do that, but not to reward them beyond the cost of their actions. WDFW investigating.
- Tax breaks for set-asides on lots < 5 acres (already exist for >5 acres)
- Gopher will be federally listed in 2012-2013. Can get less done once listing achieved, better to act now.

Potential Messages:

- Importance of prairie habitat and how connected to open space, protected species, water quality, biodiversity; how prairie benefits the landowner.
- Make people proud to be involved in protection of species, improve community spirit around prairies/oaks
- Guidance on appropriate uses of agricultural land with gopher populations.
- Difference between voles, moles and gophers.
- Pocket gophers are cute!
- Species benefited by gopher tunnels: butterflies, toads, garter snakes (get rid of mice).
- Acknowledge particular impact on landowners and formulate direct messages to them.
- Educate about survey time requirements for prairie habitat. May be ideal to survey for plants at certain times, but should balance that against ability to effectively survey for other plant species year-round.
- Share studies and recovery planning, so people know that biologists are actively seeking information.
- Not just the rural landowners dealing with it. Dept of Defense, County, conservation groups all involved.
- Ecosystem engineer concept – pocket gopher would qualify because of impact on soil etc.

b. Working group structure

Possible subgroups:

- Development permits, surveys (prairie spp and gophers), set-aside ratio, monitoring of set-asides
- PR strategies including video
- Recovery and Action planning
- Research (identify needs and implementers, generate resources)
- Translocation to west of Black River (WDFW does not oppose this anymore) and Mason County
- Funding Source Generation

Attendees

Hannah Anderson	TNC	handerson@tnc.org
Patrick Dunn	TNC	pdunn@tnc.org
Marnie Lassen	TNC	mlassen@tnc.org
Nick Miller	JBLM F&W	nicolas.t.miller@us.army.mil
Jeff Foster	JBLM	jeffrey.r.foster@us.army.mil
Jeanne Kinney	TC Public Works	kinneyj@co.thurston.wa.us
Cindy Wilson	TC Planning	wilsonc@co.thurston.wa.us
Andrew Deffobis	TC Planning	deffoba@co.thurston.wa.us
Mike Kain	TC Resource Stewardship	kainm@co.thurston.wa.us
Jeff Skriletz	WDFW	jeff.skriletz@dfw.wa.gov
Mike Walker	WDFW	
Gail Olson	WDFW	gail.olson@dfw.wa.gov
Derek Stinson	WDFW	derek.stinson@dfw.wa.gov
Michelle Tirhi	WDFW	michelle.tirhi@dfw.wa.gov
Tammy Schmidt	WDFW	tammy.schmidt@dfw.wa.gov
Mary Linders	WDFW	mary.linders@dfw.wa.gov
Marty Chaney	NRCS	marty.chaney@wa.usda.gov
Norman MacLeod	Gaelic Wolf Consulting	gaelwolf@waypt.com
Jim Kenagy	UW	kenagy@uw.edu
Linda Saunders	Wolf Haven	lsaunders@wolfhaven.org
Kim Flotlin	USFWS	kimberly_flotlin@fws.org

Mazama Pocket Gopher Draft Action Plan - updated 9 August 2010

Strategic Action	Tasks Synopsis	Priority	Implementing Party
Determine population status and current distribution	1.1. Survey and monitor population trends	2	
	1.1.1. Monitor known populations, naturally occurring and translocated		
	1.1.2. Locate additional populations, include rare soils in surveys	*	
	1.1.3. Develop and test a survey protocol and monitoring scheme		
	1.1.3.1. Identify the type, number and timing of surveys required to determine occupancy		
	1.1.3.1.1. Identify seasonal patterns of surface mounding activity (complete?)		
	1.1.3.1.2. Determine the relationship between surface mounding and gopher numbers (i.e. research indicates variable, continue research)		
	1.1.3.2. Identify the components of a monitoring scheme (e.g., frequency, etc.)		
Protect Existing Populations and Habitat	2.1. Map suitable habitat		
	2.2. Protect occupied habitat on public lands	1	
	2.2.1. Identify and redirect incompatible land use (e.g. recreation, military training)		
	2.2.2. Identify what are compatible uses		
	2.2.3. Develop and implement management agreements		
	2.2.3.1. Construct management agreement template		
	2.3. Protect occupied habitat on private lands	1	
	2.3.1. Protect habitat via land purchase, easements, etc.		
	2.3.2. Facilitate regulatory protection from development		
	2.3.2.1. Enhance implementation of regulatory process for local permitting offices and DFW	*	
	2.3.3. Identify and redirect incompatible land use as appropriate		
	2.3.4. Explicitly include gophers in incentive programs, i.e. NRCS		
2.4. Develop & disseminate habitat management guidance for land managers and private landowners	*		
2.5. Create long-term strategy to address development pressure, i.e. mitigation bank	*		
Manage, Enhance, Maintain Habitat	3.1. Reduce known direct and indirect threats	7	
	3.1.1. Control Scotch broom	*	
	3.2. Identify new direct and indirect threats		
	3.3. Identify habitat restoration, maintenance and enhancement needs on occupied sites and sites with potential for reintroduction		
	3.3.1. Expand occupied habitat through restoration (e.g. tree removal)		
	3.3.2. Determine the role of disturbance in habitat restoration, maintenance and enhancement. i.e. source, frequency, intensity, duration, and spatial extent		
	3.3.3. Evaluate vegetation composition and structure		
	3.3.3.1. Assess diversity and abundance of food resources		
	3.3.3.2. Assess vegetation structure		
	3.4. Develop, implement site-based spatially-explicit plans to restore, enhance, maintain habitat		
	3.5. Identify important habitat features	*	
	3.5.1. Identify key food plants (native & non) that are tied to survival and reproduction		
	3.5.2. Identify vegetation structure favorable to Mazama pocket gophers		
	3.5.3. Identify the level and type of disturbance beneficial to gophers and/or their habitat		
3.5.4. Determine relationship between gopher populations and soil type and structure			

Increase Sizes and Numbers of Populations	4.1. Identify sites that are suitable for augmentation or reintroduction		
	4.1.1. Identify, evaluate, and prioritize potential introduction/reintroduction sites		
	4.1.2. Identify source populations for translocations/reintroductions		
	4.1.2.1. Incorporate genetic and demographic research results as appropriate		
	4.2. Evaluate need for passive vs. active recolonization		
	4.2.1. Conduct augmentation or reintroduction if appropriate		
	4.3. Conduct translocation research	5	
	4.3.1. Evaluate efficacy and feasibility of translocating gophers (ongoing, continue)		
	4.3.1.1. Determine numbers of animals, sex ratio and timing of release.		
	4.3.1.2. Identify a release strategy to optimize survival or translocated animals (e.g., need for auger holes, confinement, food caches, etc.)		
	4.3.1.3. Determine whether moles and gophers compete for space		
	4.3.1.3.1. Determine whether competition affects translocation success		
	4.3.1.3.2. Determine whether site characteristics influence competition		
4.3.1.3.3. Determine whether mole densities influence competition			
4.3.3. Identify components of a monitoring scheme (e.g., survival, sex/age ratios)			
Additional Research	5.1. Conduct genetic and demographic studies	3	
	5.1.1. Determine population vital rates (e.g., survival, reproduction, etc)		
	5.1.2. Determine whether and how gopher populations are structured		
	5.2.2.1. Identify characteristics of dispersal that would affect population structure and viability (e.g., timing, distance, and demographics)		
	5.1.2.2. Determine effective population size		
	5.1.2.3. Determine min. viable population size relative to habitat patch size and quality		
	5.1.2.4. Describe genetic structure of populations (i.e. panmictic, metapopn, isolated)		
	5.1.3. Evaluate genetic diversity of existing populations		
5.2. Describe subspecific taxonomy of Washington populations based on DNA including mapping boundaries of distinct populations	*		
Partnerships and Outreach	6.1. Share information among interested and affected parties (Government, Tribal, NGO, private)	6	
	6.1.1. Share databases		
	6.1.2. Maintain active working group and collaborative action (ongoing, continue)	*	
	6.2. Public education	4	
	6.2.1. Develop and distribute a Mazama pocket gopher fact sheet.	*	
	6.2.2. Direct outreach to landowners of existing populations	*	
	6.2.3. Improve public perception of gophers through positive PR & other means	*	
6.2.4. Educate public on Thurston County Critical Areas Ordinance	*		

Action plan is not a recovery plan. It is not a stepwise list of all the things needed to recover a species. It is a list of "next best tasks" needed for recovery. It takes account of what is known and what is needed next.

Priority Number = Categorical ranking collaboratively prioritized by group.

Asterisk = under each categorical rank, the asterisk identifies priority tasks for that category

Protect = ensure sites are in conservation status.

Manage, enhance, restore = actions that ensure habitat is of suitable quality

Survey = assess unknown sites for occupation.

Monitor = determine trends through time of known populations