Wind Power and Ground Squirrels (Washington Ground Squirrels)

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Outline

• Species overview
  – Range, Washington Ground Squirrel history in OR and Current Status
• Recent discoveries at Wind Projects
• Minimizing impacts to ground squirrels at Wind Projects
  – Identification of Areas of Use
  – Avoiding Impacts and Mitigation
  – Leaning Juniper Case Study
    Incidental Take Permit
Overview

• Habitat- shrub-steppe and grasslands
• Prefer areas of perennial grass, less annual grass and overgrazing
• Diet consists of grass and seeds
  – Studies have found perennial grasses and forbs to have higher nutrient content than annuals
• Found in deep soils, high silt or loam, low sand or clay
• Population cyclical, not on regular intervals, shift locations over time
Genetic Study on Washington Ground Squirrels

- **Objective:** to see if landscape-level habitat fragmentation has led to some sub-populations being genetically distinct from others
- **Unknown** how much genetic variation exists between subpopulations for Washington ground squirrels
  - USFWS and NWC collecting some samples for Mike Webster at WSU, have not been analyzed
  - Leaning Juniper (Gilliam Co.) Boardman area (Morrow Co.)
  - Stateline WA (Walla Walla Co.)
Ecological Importance
Why Care about Ground Squirrels?

• Important ecosystem component
  – Burrows provide homes for various species
  – Important food source for raptors, badgers
    • ferruginous hawk, prairie falcon, golden eagle
    • badger digs create burrowing owl dens
• Also redistribute nutrients and seed banks within landscape
Washington Ground Squirrels and Neighboring Species

Washington ground squirrel

Townsend’s ground squirrel

Merriam’s ground squirrel (not pictured)
Figure 1. Geographic locations of existing and extinct Washington ground squirrel colonies, 1987-1989.

Betts, 1990.
Status

• Townsend’s ground squirrel
  – Washington State Candidate for listing
  – Federal (USFWS) Species of Concern
• Merriam’s ground squirrel
  – No Federal or State of Oregon status
• Washington ground squirrel
  – Washington State Candidate for listing
  – Federal Candidate for listing (priority 5, high, non-imminent)
Washington Ground Squirrel History in Oregon

- In 1950’s landowners claimed "there were so many of them you could shoot all day, go get more shells and return and shoot some more"

- Same landowners remember by late 1950’s almost non-existant and by early 1960’s believed to be extirpated in Oregon (Olterman and Verts 1972)

- “Re-discovered” on the Boardman Bombing Range (BBR) in 1978

- Population is now on mixture of State, Federal and Private land, BBR and neighboring Boardman Conservation Area (BCA) contains largest known single tract of habitat in OR and believed that also contains majority of the OR population
Washington Ground Squirrel—Why the Reduction?

- Threats include
  - Habitat loss:
    - estimates that 66-73% of historic habitat in range lost
    - species probably only occupies about 1-5% of historic range
  - Disease (likely more cyclical decline than long-term)
  - Livestock grazing—alteration of habitat structure and function
  - Shooting—some, frequent in the past
Annual Cycle of Activity (Washington Ground Squirrel-WGS)

• Emerge from estivation/hibernation in January-February
• Young emerge-mid-March
• Juveniles begin dispersal mid April through early May
• Begin estivation in mid-May, most down by mid-June.
• Mostly inactive from late June-December.

From known phenology at Boardman Bombing Range, other localities and species could vary slightly
Findings at Wind Projects

• Stateline and Vansycle areas
  – 1988 discovery by K. Kronner in areas that eventually would be a part of Stateline and Vansycle projects-first documentation in this area since species was “re-discovered”
  – During wildlife fatality monitoring at Vansycle and Stateline

• Leaning Juniper I & II
  – Pre-construction surveys

• Pebble
  – Pre-construction surveys

• Others currently in various stages
• Other non-wind related
Wind and Ground Squirrels
Why the Concern?

- Columbia Plateau Ecoregion of eastern OR and WA are prime wind areas
Wind and Ground Squirrels
Why the Concern?

• Due to habitat fragmentation, ground squirrels have reached levels of concern
• Wind and ground squirrels have interfaced
  – Areas need renewable energy resources, some ground squirrels have legal protection
Wind and Ground Squirrels
Why the Concern?

• Status
  – Species due to habitat loss and fragmentation are declining, some more than others

• Ecological center of the puzzle
  – Stated previously, key for multiple species survival
  – Food source for other animals
Areas of Impact at Wind Projects

- Roads
- Transmission Lines
- Turbine Pads
- Collector systems
- Some impacts temporary, some permanent
Identification of areas to be avoided

• First step is to survey appropriate habitat in season of activity
  – All areas of development in Oregon (wind and other) required to be surveyed for Washington ground squirrels
  – NWC and ODFW has worked extensively to develop methodologies suitable for the species
  – In general all areas of suitable habitat would be surveyed using transect width of 40-60 meters apart, within the leased land boundaries.

• Delineate areas of use for development to avoid

• Micrositing with planners to work development around squirrel areas
Avoidance and Mitigation

• Every attempt to avoid impacts to ground squirrels
• Soil types and prime turbine locations often don’t overlap
  – Ground squirrels need deep soils, prefer valleys, turbines often on ridges in shallow soil
• Efforts of avoidance include
  – Micrositing turbines away from colonies
  – Construction monitoring (including marking off no-access areas)
  – Training of construction and operations workers
• Once all avoidance measures exhausted must evaluate if any impact to ground squirrels or their habitat is still possible
  – If potential further impacts during construction and/or operations, the need for Incidental Take Permit (ITP) is determined by ODFW, with input provided by the developer.
Incidental Take Permit

• Agreement between developer and ODFW
  – Needed if any potential impacts to species are still possible after avoidance measures (including temporary disturbance during construction)

• ITP is a working agreement that states measures taken to demonstrate the potential “incidental take” will not adversely affect the population of ground squirrels

• Actual measures included are on case by case basis, potential measures could include (but not limited to):
  – Re-routing of facilities
  – Post-construction monitoring and reporting
  – Habitat restoration

• Note: Conservation easement - mitigation from project footprint in wildlife habitat is usually implemented for all wildlife
Leaning Juniper
Case Study

Selected to illustrate wind energy development in an area that supports WGS

• Planned and developed by Iberdrola Renewables ("PPM")
• Conditional Use Permit issued by Gilliam County Planning Department
• Sold to PacifiCorp at the start of operations
• Consists of 67 GE 1.5 MW turbines (100.5 MW Project)
• Operational since late summer 2006
Leaning Juniper
Case study

- An ITP was applied for and approved by ODFW
- Efforts taken to minimize impacts to ground squirrels included measures taken pre-construction, during construction and post-construction
- Pre-construction:
  - Moved turbines to outside of WGS habitat based soil type and known area of occupation
  - Re-routed/eliminated some project roads through habitat
  - Created off-limit areas for construction access
  - Included site tour with ODFW to discuss measures
Leaning Juniper
Case study

• During construction:
  – Flagging
  – Identification of approved work routes
  – Environmental Training of workers
    • Training of all workers on-site and reporting of any dead WGS found
  – Construction monitoring
  – Speed limits
Leaning Juniper
Case study

- Post-construction actions for impacts to native habitat and potential direct WGS impacts
  - Habitat restoration in disturbed areas
  - Conservation easement for permanent project footprint in non-cropland habitat types
  - Monitoring of colonies to obtain more information on WGS
  - Ongoing reporting of any WGS fatalities observed
    (No ground squirrel fatalities have been reported to date)
Post-construction Monitoring at Leaning Juniper

- **Objective:** to determine the current status of the 2005 baseline sites.
- **One year post-construction so far**
- **In Year 1 post-construction only one area showed no activity (Area 5)**
  - Doubtful due to construction due to location
- **Level of use in the 2007**
  - Four areas decreased in level of use
  - One area increased
  - Four areas expanded their area of use
- **Will monitor every 3 years for life of project**
- **What is not known is WGS in the whole area (monitoring area is limited to authorized areas)**
Post-construction Monitoring at Leaning Juniper

Washington ground squirrel monitoring at the Leaning Juniper Phase I Wind Power Project.

<table>
<thead>
<tr>
<th>WGS Area</th>
<th>2005 Level of Use*</th>
<th>2007 Level of Use</th>
<th>Change in Use 2005 to 2007</th>
<th>Extent of Colony **</th>
<th>Natal Sites ***</th>
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<tr>
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<td>Very Low</td>
<td>Very Low</td>
<td>NC, but slightly shifted location</td>
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</table>

*Very Low level of use = less than 1 active hole per hectare, low level of use = 1 – 5 WGS/hectare, medium = 5 – 25 WGS/hectare, high = 25 or more, very high = 250 or more WGS/hectare.

** E = Expanded, NC = No Change,Absent = No WGS or sign of use observed during surveys

***Natal sites are defined as burrows used for WGS for rearing young.

Citation: Kronner et al. 2007
How do Washington Ground Squirrels Fare Long-term around Wind?

- Not enough data yet to answer
  - Only wind power projects running longer than two years with WGS on-site are Stateline and Vansycle
  - No formal monitoring conducted
  - Informal, anecdotal spot-checking
  - WGS persisting ~1-2 miles along one turbine string in WA (landowner use is the same as before wind turbines) through 2008
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• ODFW
• and the squirrels

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