NORTH AMERICAN BAT MONITORING IN OREGON: PROJECT UPDATE

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Bats in Oregon

- 15 species found in Oregon (of 44 species total in US, Canada)
- Long-lived – up to 20 years
- Winter hibernation or migration
- Nocturnal
- Long distance movements (1000-km)

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Silver-haired Bat

Hoary Bat

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Economic Importance

- Insect eaters – nature’s pest removal system for agriculture and forestry
- Roughly $22.9 Billion per year saved in pesticide cost in the U.S. *(Science 01 Apr 2011: Vol. 332, Issue 6025, pp. 41-42)*

Pallid Bat; Photo by Merlin Tuttle
Oregon Conservation Strategy

- 8 of Oregon’s 15 bat species are Strategy Species
  - Priority: filling data gaps

- Primary threats:
  - Wind Energy – turbines
  - White-nose Syndrome

oregonconservationstrategy.org
Bat Grid Inventory and Monitoring Project

- 2003 – 2010
- Oregon and Washington
- BLM & USFS

Objectives

- Inventory the presence of bat species using a standardized survey effort
- Collect baseline data on acoustic, morphologic, & genetic characteristics for identification of bat species in the region
Bat Grid Inventory and Monitoring

Rodhouse et al. 2012, 2015 – visit USFS PNW ISSSP web pages
North American Bat Monitoring Program (NABat)

- 2015 – Present
- White-Nose Syndrome (WNS)
- Need for standardized monitoring program
- Promote effective conservation decision-making and long-term viability of bat populations across the continent
North American Bat Monitoring Program (NABat) (cont.)
Oregon NABat (“Bat Grid 2.0”)  
- Collect baseline distribution data  
- Revisit areas surveyed during the Bat Grid  
- Contribute to NABat  
- Only acoustic monitoring  
- Partners – ODFW, NPS, USGS, USFWS, BLM, USFS  
- Contractor – Zotz Ecological Solutions
Oregon NABat ("Bat Grid 2.0")

- 2-year pilot study (2016 and 2017)
  - Establish and test protocols
  - Test statistical approach
  - Galvanize partner participation

- USFWS State Wildlife Grant
Sampling Design

- Blend original Bat Grid & NABat
- 65 Sample Units (10 x 10 km)
  - 35 SUs: original Bat Grid, ≥ 3 visits
  - 30 SUs: NABat, ordered list
- Acoustic monitoring only
- June 1 – August 30
Survey Period: June 1 – August 31
Sampling Design (cont.)

- 4 acoustic detector sites/SU
  - 1 detector site per 5 x 5 km quadrant

- Monitoring duration: 1 full night (15 min before sunset until 15 min after sunrise)
Field Data Collection

- Biologists
  - ODFW
  - BLM, USFS, NPS, FWS
  - Volunteers

- Acoustic Detector Deployment
  - Pettersson D500x detector

- Additional Data Collected
  - Photos
  - Locality & habitat
  - Conditions – microphone orientation, clutter
Acoustic Data Processing & Analysis

- Filter out bat calls from noise
  - Kaleidoscope 3.1.1 and manual review
- Auto-classify calls to species
  - Sonobat 4.0.7, Oregon East or West classifiers
- Vet auto-classified calls
  - 1-2 call files per species/site
## Results – Sample Units

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<th>USFS</th>
<th>FWS</th>
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Results – Acoustic Data

- > 238,000 acoustic files were recorded
- > 46,000 files with bat calls
  - 16,053 files Sonobat classified
  - 4,117 files manually reviewed
- Statistical analyses led by USGS, NPS
Results – Bat Call Data (cont.)

Number of Sample Units

- Silver-haired bat
- Little brown bat
- California myotis
- Hoary bat
- Big brown bat
- Yuma myotis
- Long-eared myotis
- Fringed myotis
- Pallid bat
- Canyon bat
- Mexican free-tailed bat
- Townsend’s big-eared bat
- Spotted bat
Pallid Bat

Bat Grid 2.0 (2016)
- Present
- Absent
Mexican Free-tailed Bat

Range Map

Bat Grid 2.0 (2016)

Present

Absent

10 SUs
Summary

- All 15 species known to occur in the state were documented
- No. of SUs per species – as expected
- Mexican free-tailed bat – possibly outside of known range
  - Should not base range extension on acoustics alone – capture necessary
- Data provided to field biologists for use in land use project review
Progress To Date

- Upload data to NPS/FWS Bat Database
- Testing of statistical analyses (power analysis) based on sampling design
  - “Was 1 night per detector site adequate for estimating probability of detection?”
- Standard Operating Procedures for field deployment, call analysis, data entry
- Partner presentations TWS, WBWG
- Participation on national NABat efforts
Plan for 2017

- Revise sampling design & protocols
- Improve training materials & conduct more training
- Revise field manual & datasheets
- Coordinate with agency partners
- Recruit more participation
- Fundraising for long-term programming
  - Competitive SWG proposal
Acknowledgements

- Biologists:
  - ODFW
  - USFS
  - BLM
  - NPS
  - FWS
  - Volunteers

- Roger Rodriguez
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- Kirk Navo
- Laura Ellison

- Funding - U.S. Fish and Wildlife Service