Oregon White Oak Forest Health Challenges

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Photo Rob Flowers

Threats to Oregon White Oak

- Habitat destruction
- Invasive species
- Fire suppression impacts
  - Ingrowth of conifers
  - “densification” of oaks
- Insects and Diseases
- Management

False brome (*Brachypodium sylvaticum*) under oak and Douglas-fir

Fire suppression forest structure changes:
Invasion of fir and increased density of oaks.

Active Management

- So you have everything under control….
  - Habitat
  - Structure/competition
  - Invasive species

- Does a healthy Oregon oak woodland/forest include native insect pests and pathogens?

Oak Mistletoe

Phoradendron villosum

Oak Mistletoe: General life history.

- Seed dispersed by birds
- Deposited on twigs (generally can't infect thick bark)
- Localized infection
- Ages in place as branch continues to grow

Oak Mistletoe Impacts

- Observational evidence suggests:
  - as mistletoe persists in the tree crown over decades
  - and the population of plants increases
  - Heavy infestation causes:

- Branch and top dieback
- Increase drought stress
- Contribute to tree death

- Data is lacking but would predict:
  - Reduced growth
  - Reduced acorn production

Kyle Pritchard.

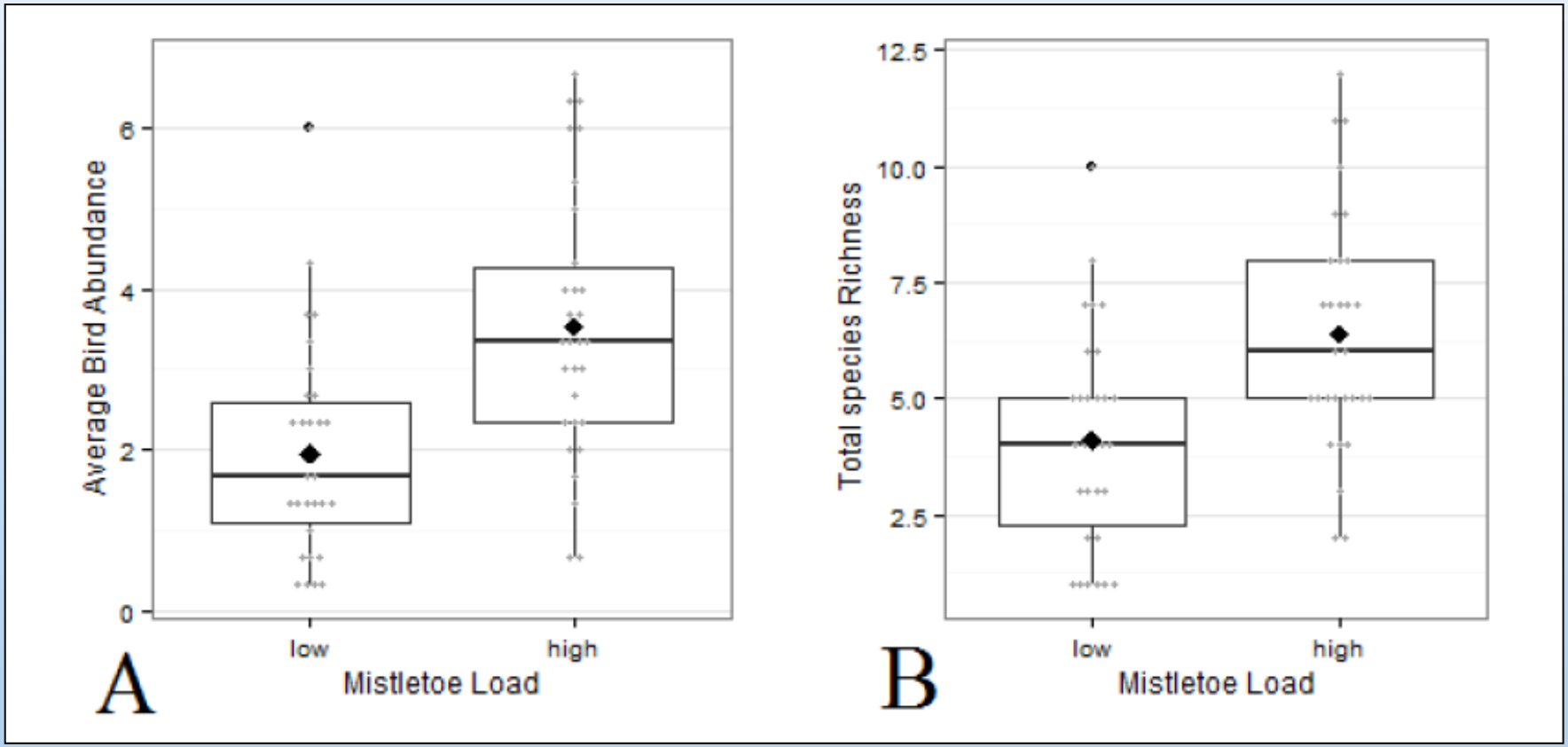
2015. Bird abundance and microhabitat associations with oak mistletoe in Willamette Valley oak woodlands. MS Thesis, OSU.

- Is oak mistletoe associated with increased microhabitat features (dead wood, cavities, swellings and plants? YES
- Does an old tree with lots of oak mistletoe have more avian visitors in spring than an equivalent tree with low mistletoe? YES
- What birds disperse seed? WESTERN BLUEBIRD!

Joan Hagar, USGS, Dave Shaw, OSU


Microhabitat Features:
- Number of swellings
- Dead wood
- Loose bark
- Natural cavities

Observations paired low load vs high mistletoe load trees



- Increased bird abundance and richness

Seed Dispersers/major frugivores

- Citizen Science Project
  - Report observations (16 responses)
  - 14 W. Bluebird
  - 1 Wild Turkey
  - 1 Amer. Robin
- Cameras on plants with fruits
  - Unknown = 77
  - W Bluebird 61 (26%)
  - Amer Robin = 17 (7%)
  - Cedar Waxwing = 7
  - Stellar's Jay = 4
  - Black-capped Chickadee= 2

Western Bluebird

Place cameras in Trees


Bushnell
Cam005 29.64In→ 39℉
01-27-2012 22:09:36

Conclusions

- Mistletoe load is positively related to:
- Structural heterogeneity
- Spring bird abundance, species richness, and tree use.
- Western bluebirds are important frugivores

Western Oak Looper

Lambdina fiscellaria somniaria
(Lepidoptera: Geometridae)


Rob Flowers


Rob Flowers

Western oak looper

Caterpillar
Pupae
Moth

Western Oak Looper Cycles

From Beth Willhite USFS

Table 1. Documented outbreaks of western oak looper in Oregon and Washington.

Outbreak Year	County	State
Circa 1926-1927	Polk	Oregon
1930-1931	Polk	Oregon
1957-1958	Lane/Lewis	Oregon/Washington
1960-1966	Polk, Benton, Yamhill	Oregon
1977-1978	Polk, Washington, Yamhill/Lewis	Oregon/Washington
1992-1996	Polk, Benton, Yamhill	Oregon
1999-2002	San Juan	Washington
2008	Jackson	Oregon
2011-2013	Polk	Oregon

Furniss and Carolin, in 'Western Forest Insects' say, "In some seasons the oaks over large areas in the Willamette Valley, Oregon are completely defoliated by this insect. No permanent damage is done."

Oak root and butt rots

- Caused by complex:
- ***Inonotus dryadeus***
- ***Ganoderma applanatum***
- ***Armillaria Species***
- Biggest Threat to Large old trees

Ganoderma applanatum conks

Conclusions

- **Oregon White Oak FOREST health is complicated.**
- **Native insects and disease may play important roles in ecology**
- **Active management should keep some diseased (mistletoe) trees**
- **Root rot is biggest native threat to large old trees**

Speckled gall wasp gall


QUESTIONS?