

Raven management in the Baker Sage-Grouse Priority Area of Conservation (PAC)



Sage-Grouse Population Limiting Factors

- **Habitat Conditions**
- **Human Disturbance**
- **Nest Predation**

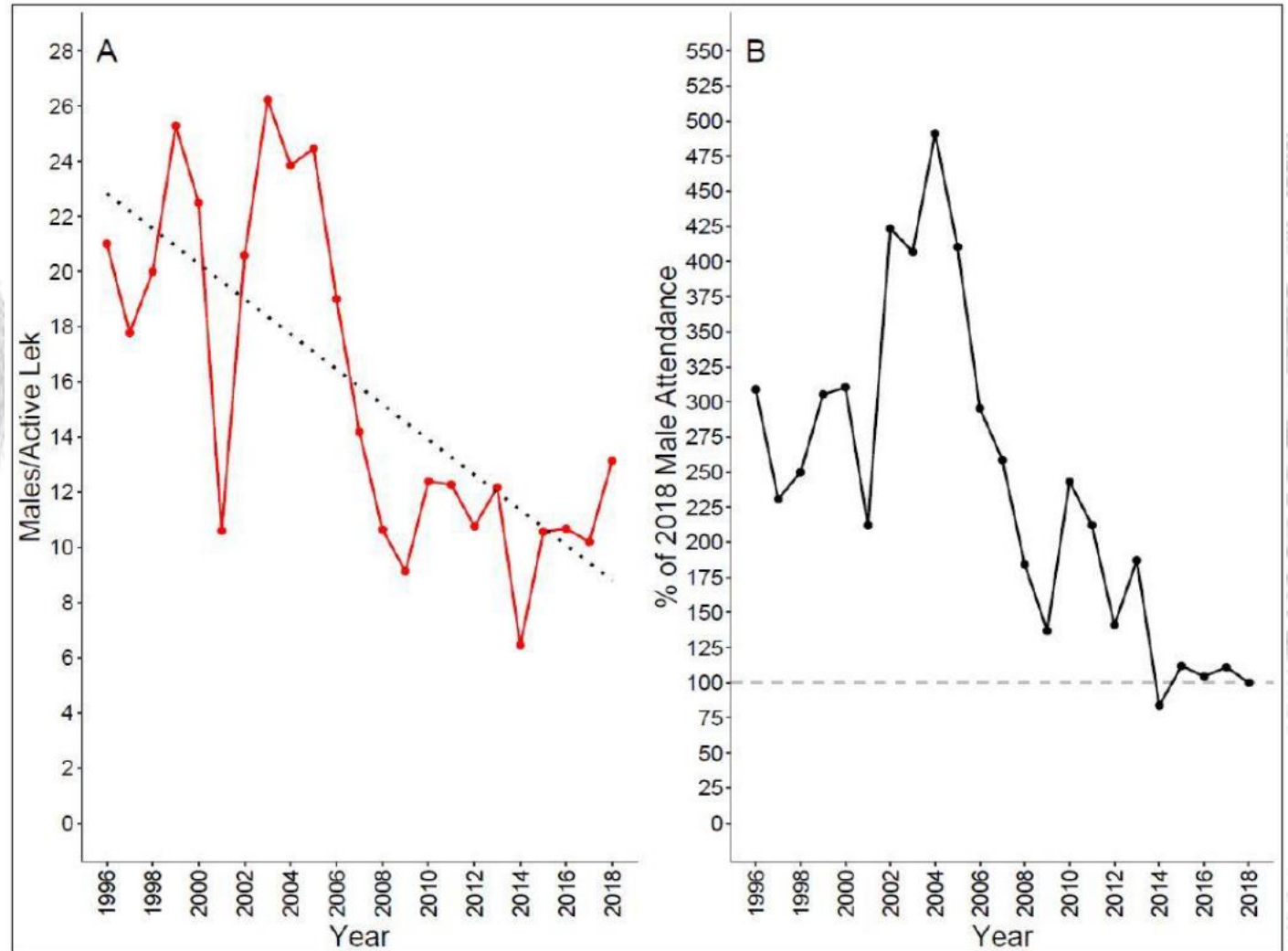


Addressing Habitat Conditions and Human Disturbance

- Comprehensive threat reduction has been ongoing since 2010
- Just in 2017, partners collaborated on \$261,000 in habitat projects, including:
 - 2,203 acres of juniper removal
 - 2,621 acres of invasive annual grass treatment
 - 1,193 acres of noxious weed surveys
 - 625 acres of noxious weed treatment
 - 265 acres seasonally protected from OHV disturbance
 - 12 miles of fence fitted with anti-strike markers
 - 5 conservation reserve enhancement program (CREP) renewals
 - 3 enrollments in the Sage-Grouse programmatic CCAA
 - PAC-wide assessment of Sage-Grouse habitat completed

Sage-Grouse Declines in the Baker PAC

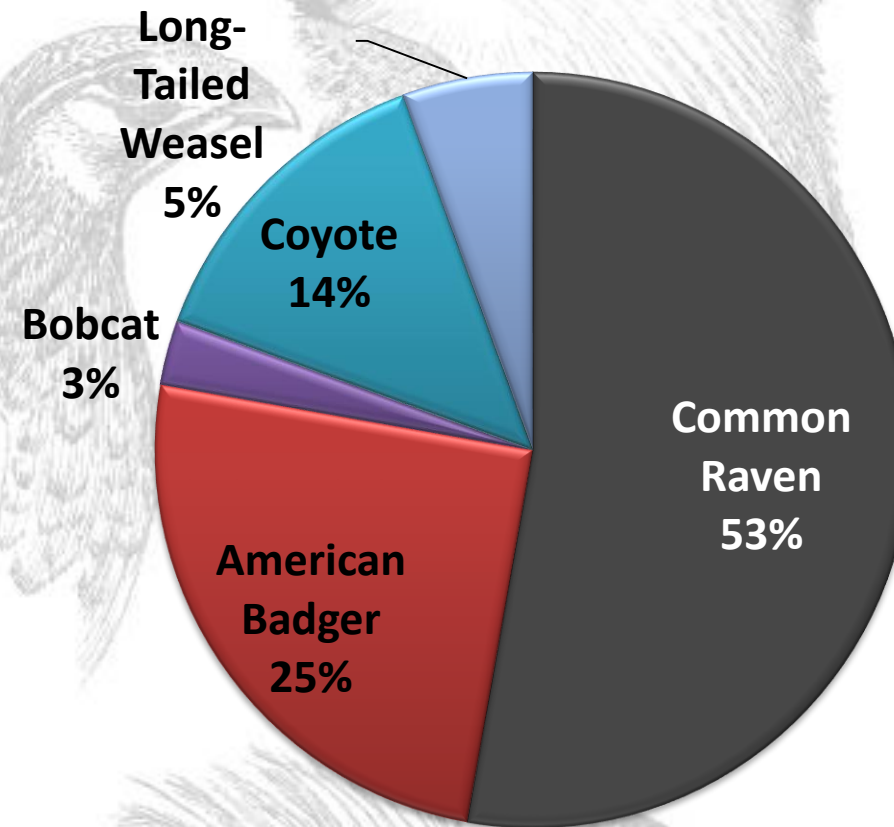
- Despite comprehensive actions in the Baker PAC:
 - Population estimates declined by 75% since 2005
 - Highest risk of extinction in Oregon
 - Only 248 individuals remain in 2018



Raven Impacts on Sage-Grouse Nest Success

- Raven populations are increasing at 3% per year (Western US)
- Responsible for >50% of Sage-Grouse nest failure*
- Where densities exceed 0.46 ravens/km², nest success is reduced**
- Recent surveys estimate densities in the Baker PAC are **0.52 ravens/km²**

Sage-Grouse Nest Predators in Nevada

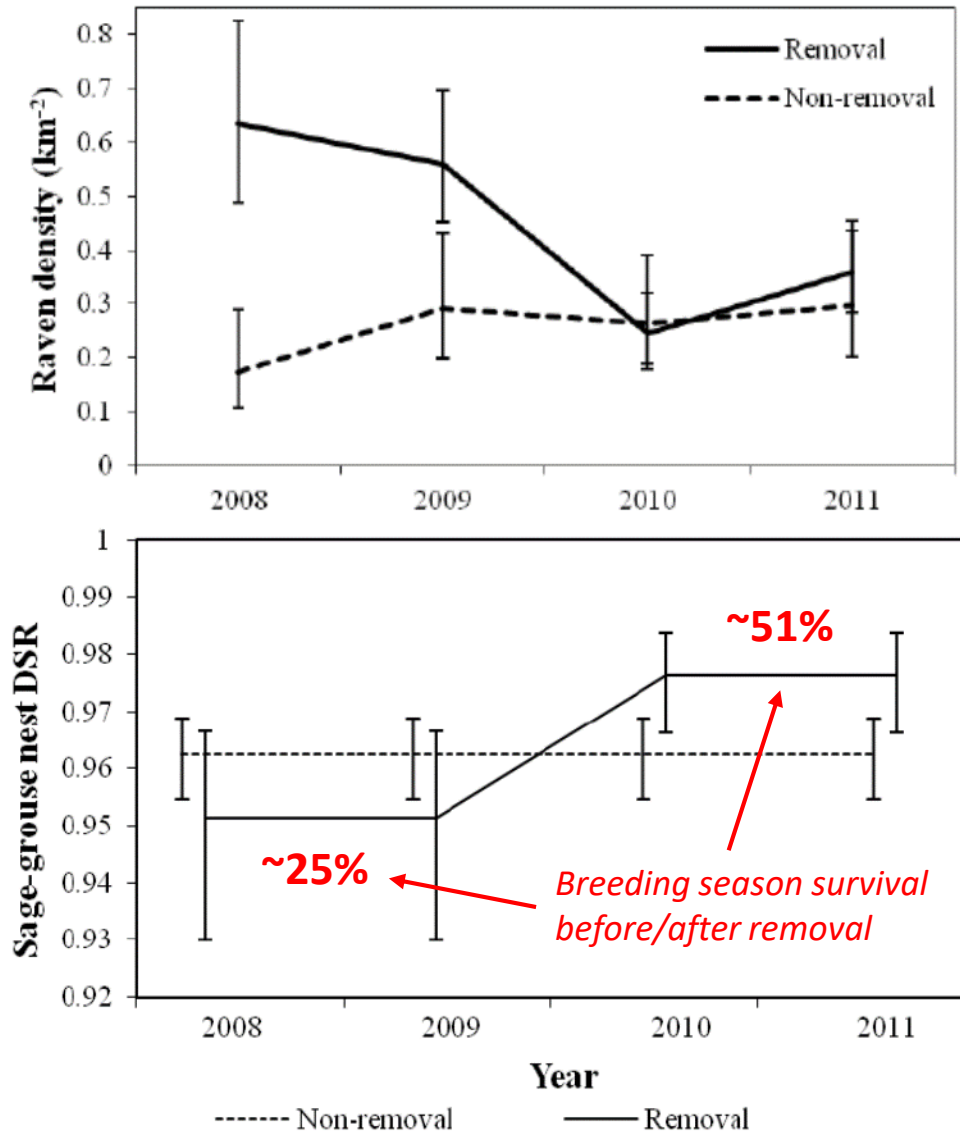


* (Coates et al. 2008, Lockyer et al. 2013)

** (Coates 2007, Coates and Delehanty 2010, Dinkins et al. 2016, Peebles et al. 2017)

Reducing Raven Density Increases Sage-Grouse Nest Success

- Experimental reductions resulted in increases in nest success (*Dinkins et al. 2016, Peebles et al. 2017*)
 - Reductions from 0.6 raven/km² to 0.2-0.3 ravens/km²
 - Resulted in higher daily nest survival rates (DSR)
 - Increasing breeding season survival from 25% to **51%**

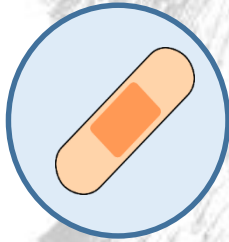


Baker PAC Raven Project

Methods

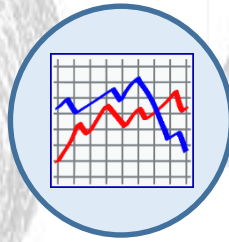
- Remove 500 ravens per year for 3 years in the Baker PAC
- Cooperative efforts with Oregon State University
- Treated chicken eggs (DRC-1339) – specific to Corvids

Objectives



Short-term relief

- Stop-gap while habitat measures are underway



Effectiveness

- Determine if reducing Raven density will benefit Sage-Grouse in Oregon



Raven ecology

- Understand interactions between Ravens and Sage-Grouse in Baker PAC



Human subsidies

- Identify human subsidies to ravens

Develop effective non-lethal management strategies

Raven management in the larger context

Ongoing Habitat Restoration \$8.5 million

- NRCS
- USFWS
- ODFW
- Tri-County CWMA
- Baker County
- BLM
- Private landowners

OWEB Focused Investment Partnership \$6.1 million

- Vegetation management
- Staff capacity
- Information gaps
- Outreach and engagement

OSU Research

\$800,000

- 2 PhD students started in 2017
- Interactions between ravens and sage-grouse in Oregon
- 104 radio-marked Sage-Grouse
- 500 avian point count surveys
- 6 radio-marked Ravens

Raven Removal Project \$63,000

- Short-term relief from sage-grouse nest predation