
Photo: Jared Hobbs

Spotted owl resilience in Washington

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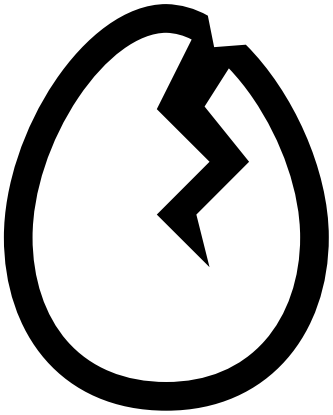
Washington Department of FISH & WILDLIFE

Spotted owls are in steep decline in Washington and across their range.

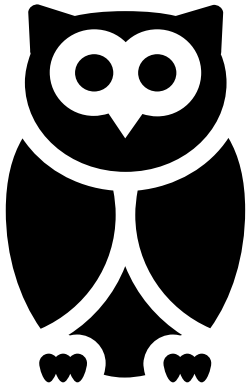
- Without immediate intervention, we expect them to be functionally extinct within Washington within the decade.
- WDFW is committed to preventing this loss.
- There are no easy options left - we are down to the most difficult options.

Three-pronged approach to recovery

Maintain habitat



Population augmentation



Barred owl management

Three-pronged approach to recovery

Maintain habitat

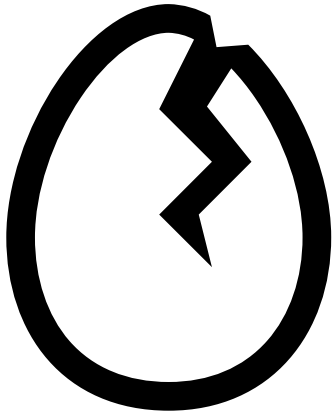
Tools to protect NSO habitat

- Impact of timber harvest reduced, not eliminated
- State land use plans, HCP and Conservation Benefit agreements
- USFWS designated Critical Habitat
- NWFP is working

Northwest Forest Plan Amendment

- Landscape approach to protect T&E species and provide sustainable timber harvest
- The amendment applies to units in Washington's PNW Region (Region 6)
- Incorporate new information: 2011 NSO recovery plan, 2012 NSO critical habitat designation and 2021 critical habitat designation revision.
- The amendment will address wildfire, climate change, and management needs of mature and old growth forests
- WDFW will provide comments for the draft EIS, due 3/15

Three-pronged approach to recovery



Population augmentation

Augmentation feasibility assessment

1) Identify potential sites for translocations

2) Simulate spotted owl abundance and distribution responses to barred owls and their removal

3) Simulate a range of translocation scenarios that include spotted owl genetics and post-translocation survival

4) Conduct simulation experiments that quantify and compare the return on investment of alternative translocation and barred owl management actions for increasing spotted owl persistence

Breeding spotted owls in captivity

Effective recovery = barred owl management + spotted owl population augmentation

- Wild-wild translocation, captive rearing, captive breeding

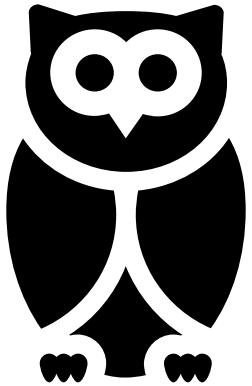
Northern Spotted Owl Breeding Program (NSOBP)

- Successful husbandry techniques
- 17 years of research

Augmentation strategies and working group

- Soliciting interest from conservation partners
- Augmentation only effective alongside habitat preservation and barred owl management

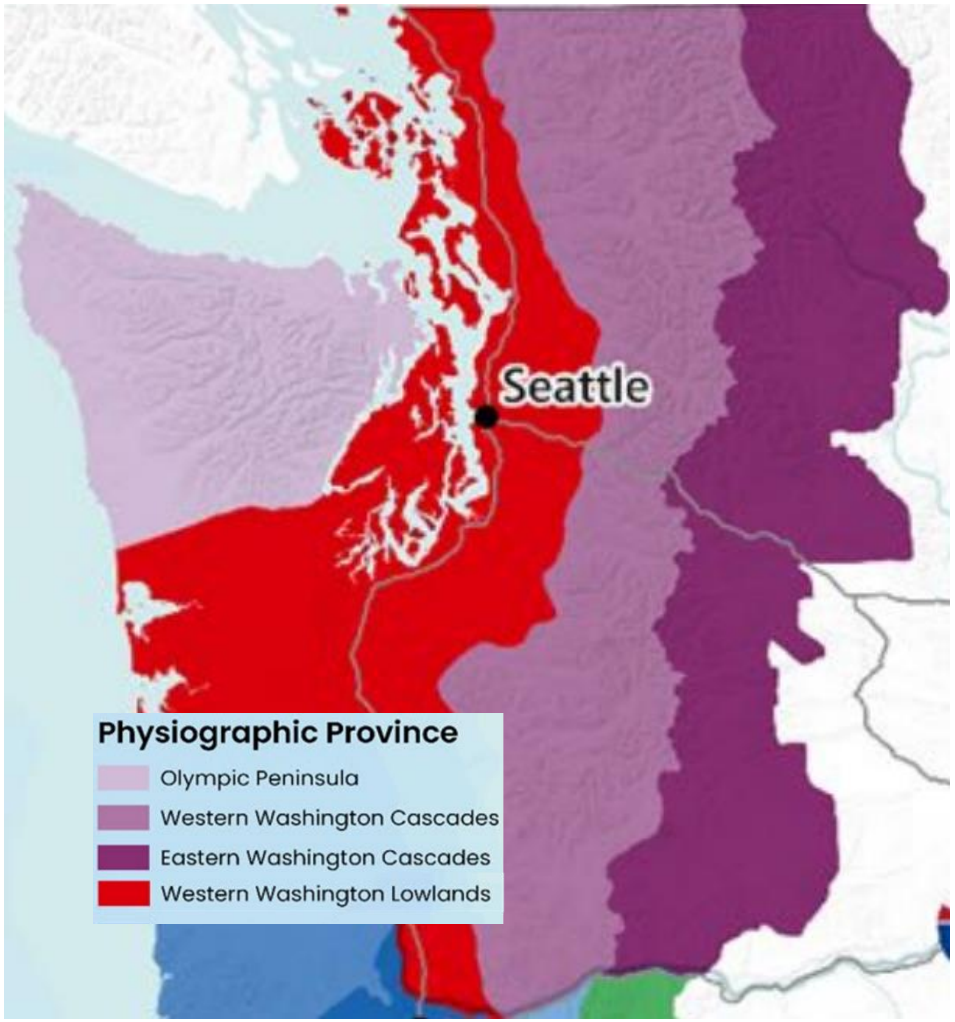
Three-pronged approach to recovery



Barred owl management

Barred Owl Management Strategy

- Record of Decision (ROD) signed 8/27/24
- 30-year plan
- Calls for removal of BO in SO habitat
- Includes 4 physiographic provinces in Washington



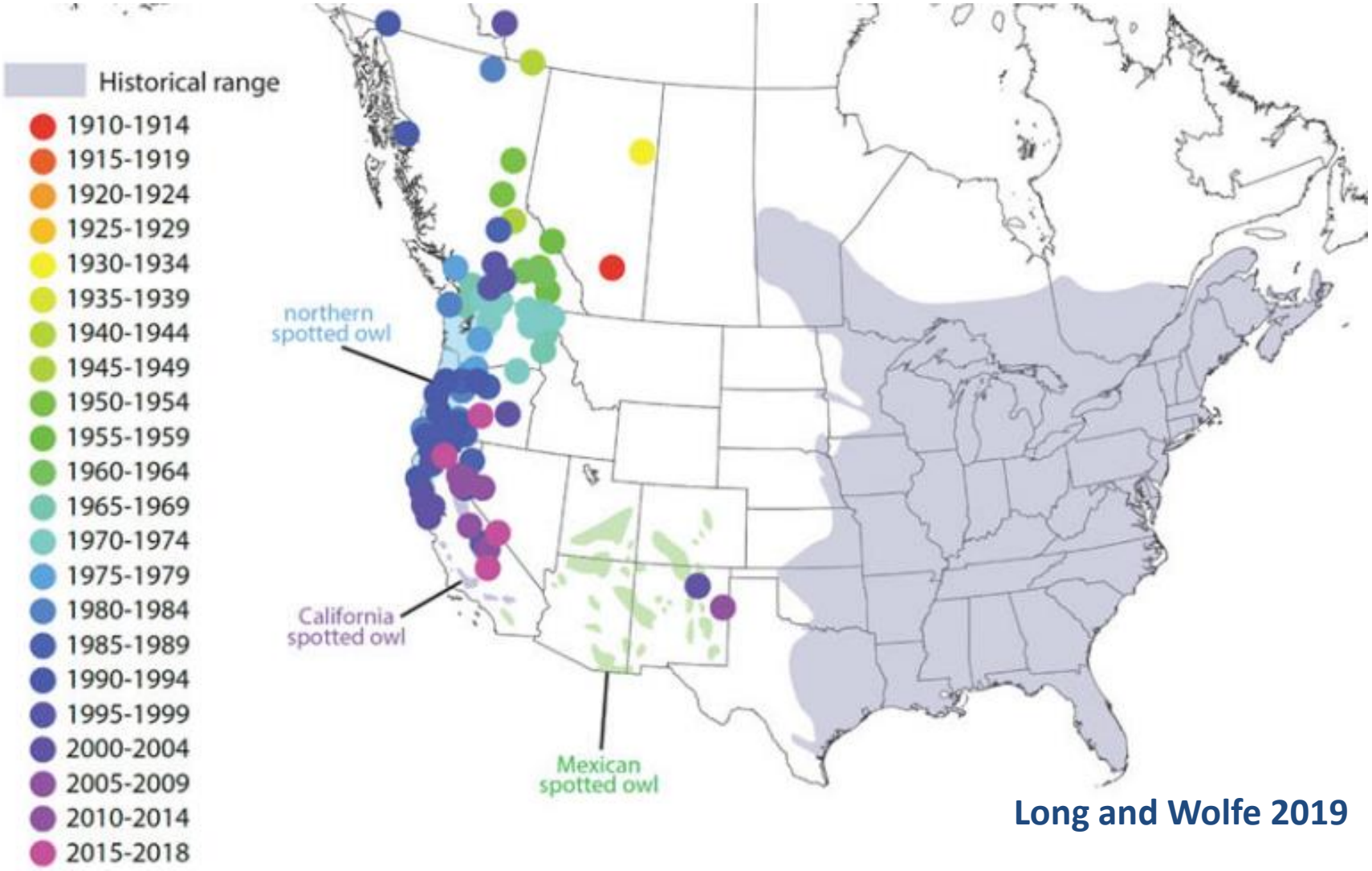
Classified by USFWS as invasive

- Executive Order 13112 (Invasive Species)
- Non native species expanded due to alteration of habitat by humans
- Significant environmental harm to ESA listed species
- Harming other species
- Trophic cascade risk


Photo: Jennifer Howard


Photo: Harry Collins

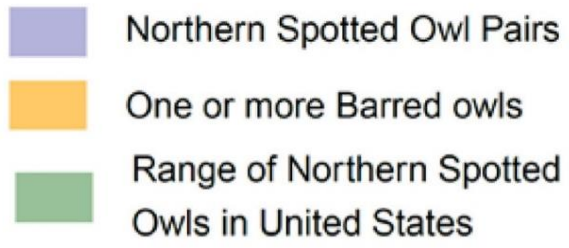
Barred owl invasion

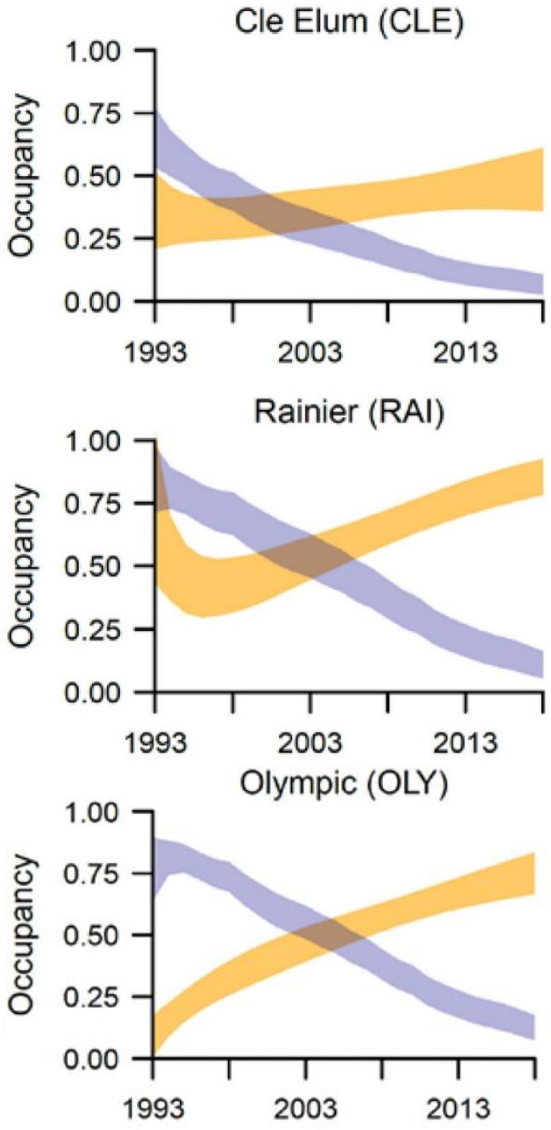


Long and Wolfe 2019

Effects of barred owls on spotted owls

- Barred owls make spotted owl habitat inaccessible and unviable
- Greatest direct factor driving population decline
- Increased extinction rates
- Decreased colonization rates, occupancy, survival
- Hybridization





Franklin et al. 2021

Not a direct replacement – not filling the same niche

Northern spotted owl

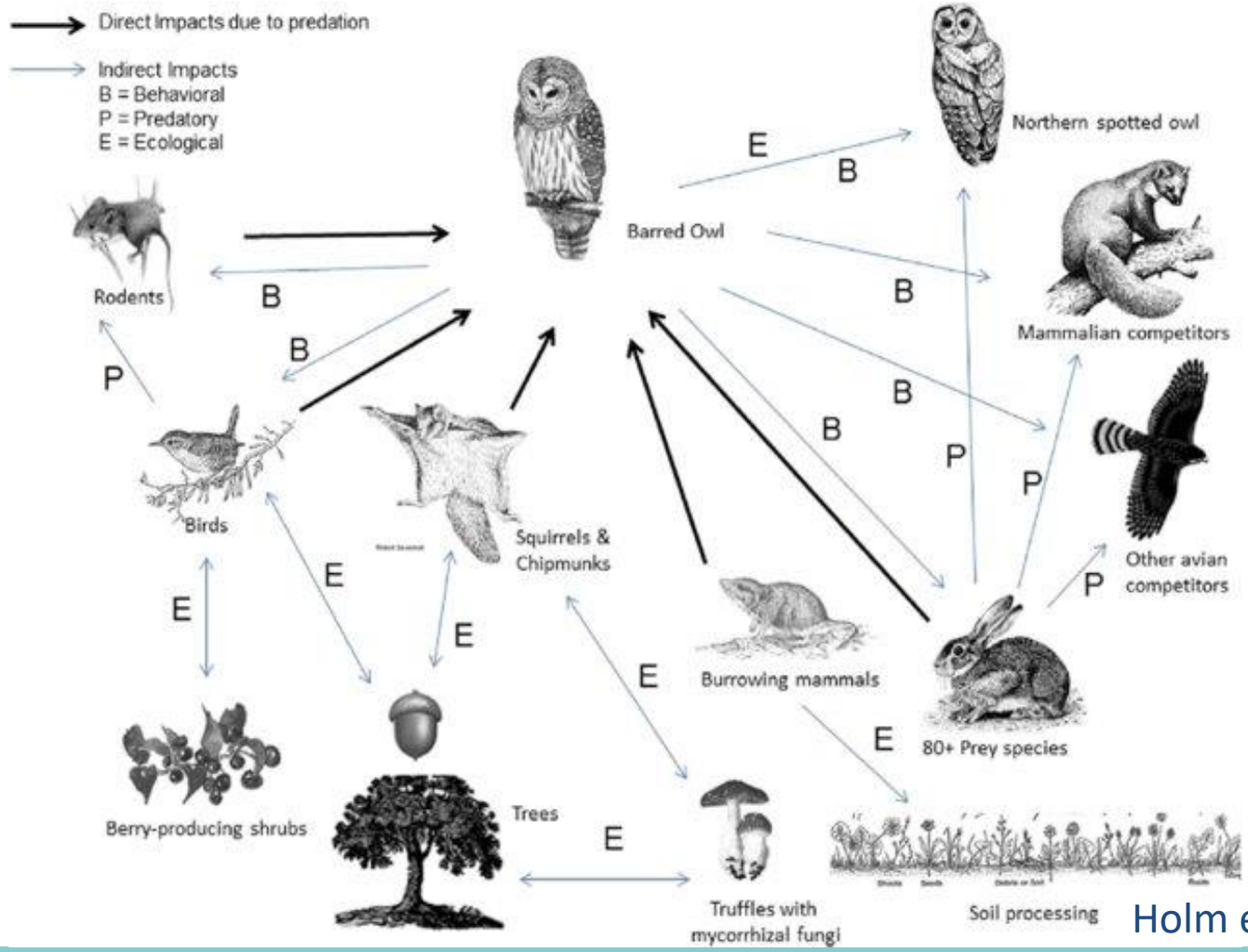
- Habitat and prey specialist
  - Structurally complex mature, old forest
  - Nocturnal arboreal and semiarboreal prey
- Home range: μ = 6,500-8,900 ac
- 1-2 young; Do not breed every year

Barred owl

- Habitat and prey generalist:
  - Young-mature forest; riparian and meadows
  - Some daytime hunting; wider range of prey taxa
- Home range: μ = 1,436 ac
- 2-3 young; breed every year

Barred owls eat everything

Potential for new listings



Holm et al. 2016

Barred owl management

Interactions with imperiled species

Species	Agency Status		Potential Interaction	
Common Name	Federal	WA	Prey	Competitor
Mammals				
Canada Lynx	T	E		Yes
Cascade Red Fox	-	E		Yes
Fisher	E	E		Yes
Mazama Pocket Gopher	T	T	Yes	
Western Grey Squirrel	-	E	Yes	
BIRDS				
Marbled Murrelet	T	E	Yes	
Northern Spotted Owl	T	E		Yes
Western Screech Owl	-	S	Yes	Yes
Oregon Vesper Sparrow	-	E	Yes	
Western Yellow-billed Cuckoo	T	E	Yes	
AMPHIBIANS AND REPTILES				
Foothill Yellow-legged Frog	PE/PT	S	Yes	
Oregon Spotted Frog	T	S	Yes	
Western Pond Turtle	-	E	Yes	
Fish				
Bull Trout DPSs	T	C	Yes	
Steelhead DPSs	E/T	C	Yes	

USFWS 2024

Barred owl management

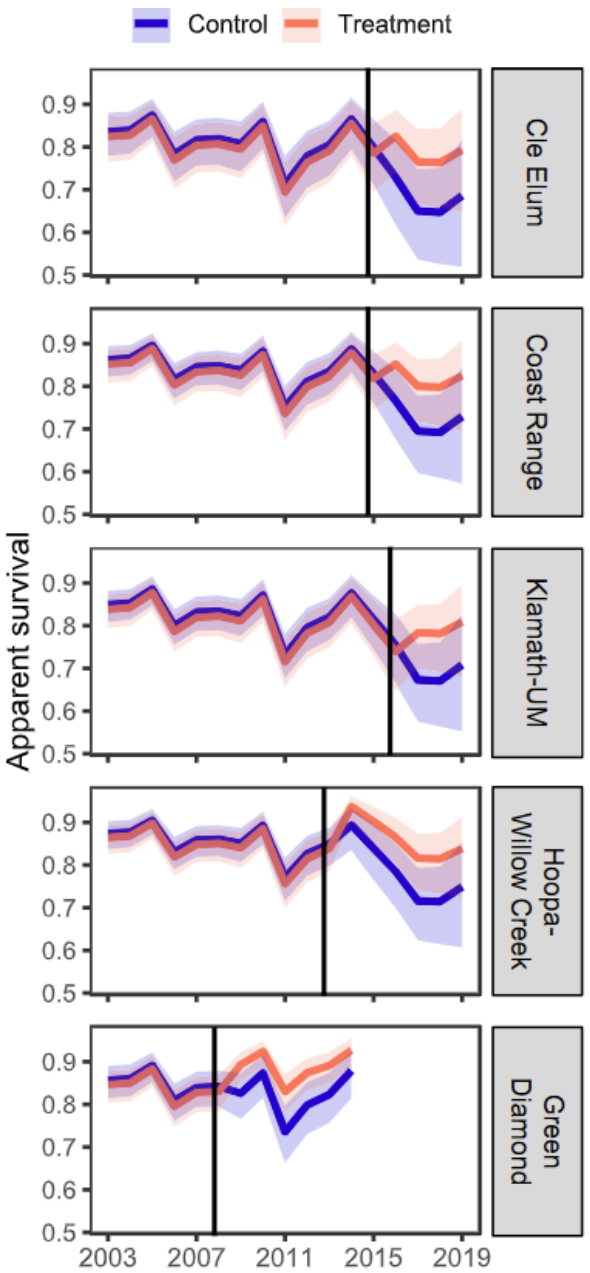
Percent frequency of occurrence (FOO) in owls and weighted percent of occurrence (wPOO), or percentage of total diet

Scientific name	Common name	FOO	wPOO	Scientific name	Common name
Glaucomys sabrinus	Northern flying squirrel	21.77	7.06	*Taricha sierrae*	Sierra newt
Tamiasciurus douglasii	Douglas squirrel	17.74	4.96	*Thamnophis sirtalis*	Common garter snake
Pseudacris regilla	Pacific tree frog	16.13	4.58	*Sceloporus occidentalis*	Western fence lizard
Peromyscus boylii	Brush mouse	11.29	2.42	*Dendragapus fuliginosus*	Sooty grouse
Neotoma fuscipes	Dusky-footed woodrat	9.68	3.20	*Anas clypeata*	Northern shoveler
Scapanus latimanus	Broad-footed mole	9.68	2.61	*Myotis lucifugus*	Little brown bat
Sorex spp.	Shrew species	8.87	1.91	*Thamnophis elegans*	Western garter snake
Anaxyrus spp.	Toad species	8.06	2.62	*Zenaida macroura*	Mourning dove
Pseudacris sierra	Sierran tree frog	7.26	1.29	*Lepus* spp.	Hare species
Thomomys spp.	Pocket gopher species	6.45	1.86	*Sciurus griseus*	Western gray squirrel
Ensatina eschscholtzii	Ensatina	4.84	1.32	*Ambystoma macrodactylum*	Long-toed salamander
Bonasa umbellus	Ruffed grouse	4.03	1.59	*Aegolius acadicus*	Northern saw-whet owl
Family Mephitidae	Skunk species	4.03	1.06	*Felis catus*	Domestic cat
Tamias spp.	Chipmunk species	4.03	1.03	*Oncorhynchus mykiss*	Rainbow trout
Elgaria coerulea	Northern alligator lizard	3.23	1.32	*Bombycilla cedrorum*	Cedar waxwing
Columba livia	Rock pigeon	3.23	0.90	*Dendroica coronata*	Yellow-rumped warbler
Coluber constrictor	Eastern racer	3.23	0.65	*Mus musculus*	House mouse
Lampropeltis californiae	California kingsnake	3.23	0.63	*Charina bottae*	Rubber boa
Patagioenas fasciata	Band-tailed pigeon	3.23	0.61	*Dicamptodon tenebrosus*	Coastal giant salamander
Contia tenuis	Sharp-tailed snake	3.23	0.47	*Meleagris gallopavo*	Wild turkey
Diadophis punctatus	Ring-necked snake	2.42	0.87	*Leuconotopicus villosus*	Hairy woodpecker
Family Anatidae	Waterfowl species	2.42	0.81	*Aythya* spp.	Diving duck species
Microtus californicus	California vole	2.42	0.72	*Falco sparverius*	American kestrel
Gallus gallus	Domestic chicken	2.42	0.56	*Anas* spp.	Dabbling duck species

Kryshaka et al. 2022

Why removal?

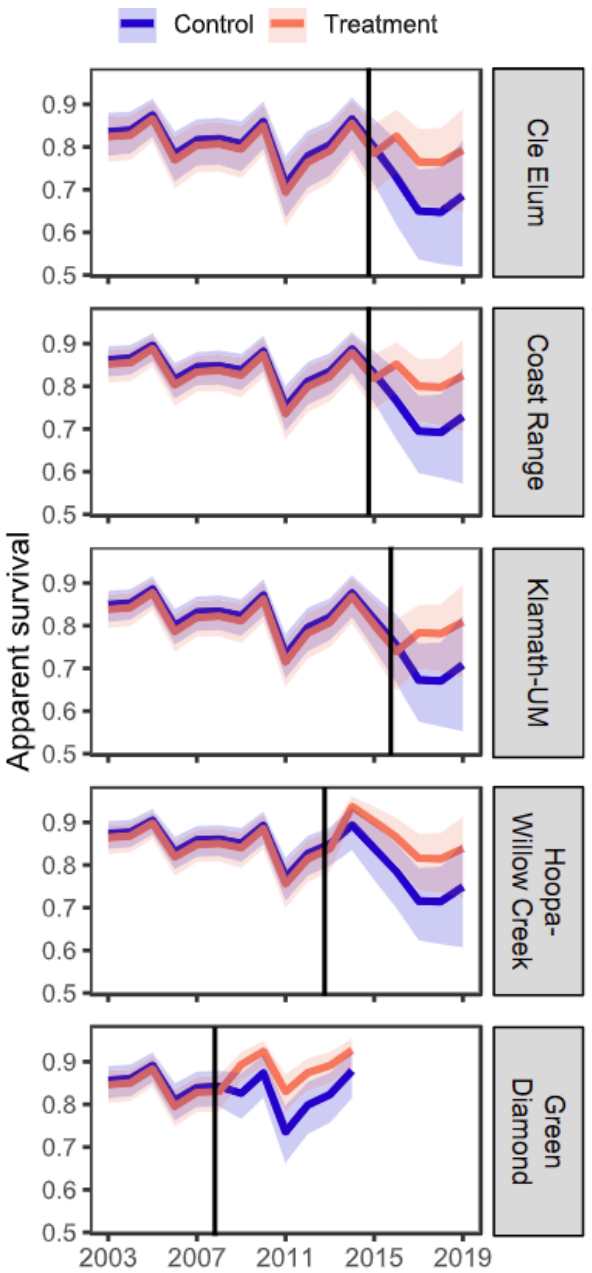
- Removals improved NSO survival, dispersal and recruitment
  - BO Site occupancy declined from 0.19 to 0.03
  - BO site extinction exceeded colonization
  - NSO recolonized 56% territories within 1 year
  - Populations stabilized within 3-6 yrs
  - NSO declined ~12.1% in control areas



Wiens et al. 2021

Why removal?

- Removal works!
- Extinction in WA likely without it
  - removing <1% of the barred owl population to help prevent spotted owl extinction
- Enables other management actions
  - Combine with NSO augmentation
  - Research to evaluate impacts to other species



Wiens et al. 2021

Implementation elements

Permit

Review and approval of project and Removal Specialists

Management

All landowners eligible

Hire contractors (APHIS) or trainers for staff

Monitoring

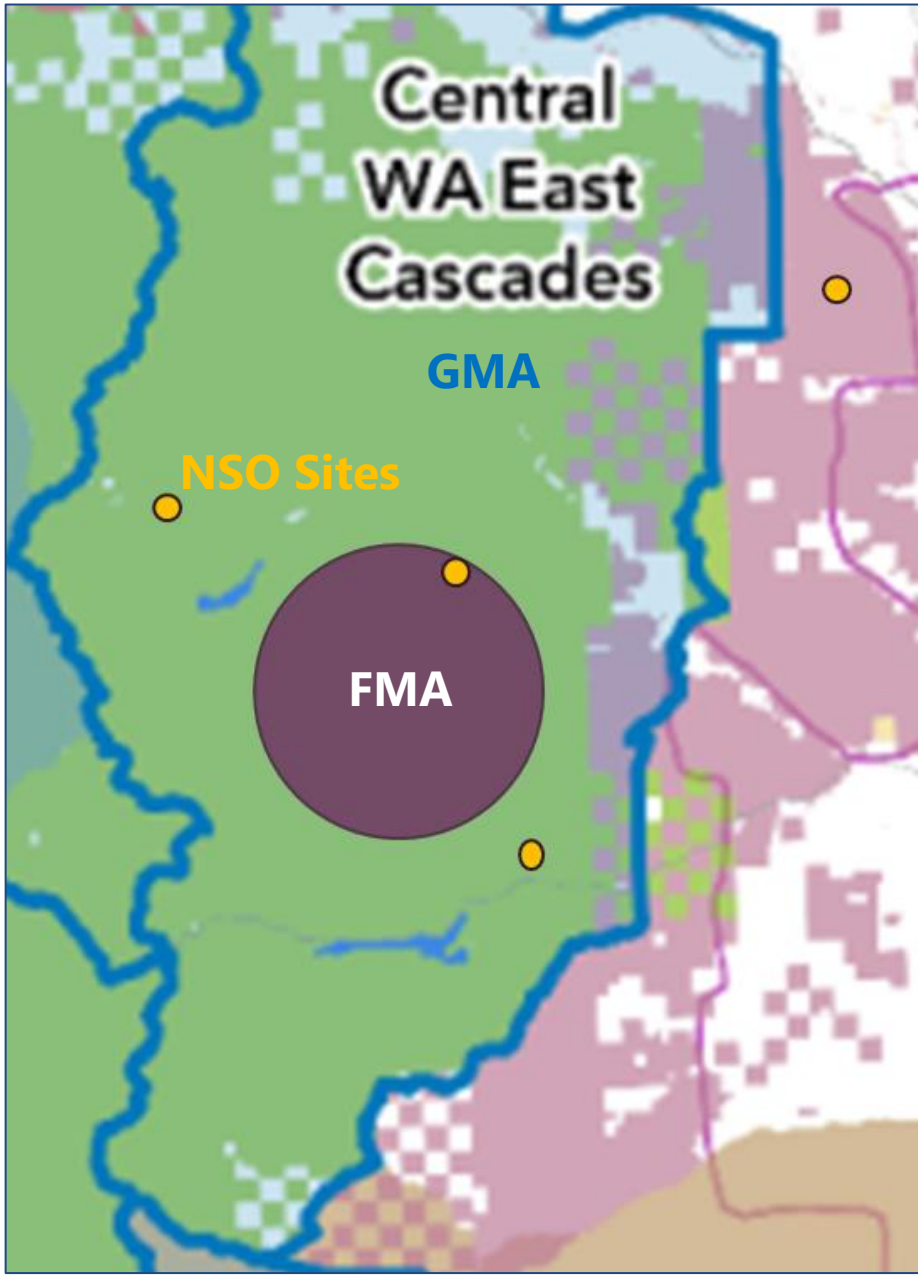
Barred and spotted owl responses to management

Assess success & effectiveness

Barred owl management

Removal areas

- Occupied Site Management
  - **First to receive management**
- General & Focal Management Areas, Special Designated Areas
- Towns and populated areas **excluded**
  - ¼ mile buffer around towns, occupied dwellings, campgrounds, locations with regular human use



Other jurisdictions on board

- Canada – BC NSO breeding and BO removal since 2007
- Oregon – HCPs; ODFW is supportive and working with USFS on removal plans
- California – CDFW supportive and working with BLM on removal plans
- Some of the current experimental barred owl removal will continue
- Yakama Nation – implementation ASAP, seeking funding
- APHIS is implementing entity
- BOMS Implementation Working Group for WA

Critiques and considerations

- We don't take this lightly – at all
- What we do know – what the best available science tells us
- What we don't know – confronting uncertainty
- Conservation-reliant species
  - A species that is dependent upon direct human intervention (Scott et al. 2005, Rohlf et al. 2014)
  - 84% of ESA-listed species considered conservation-reliant (Scott et al. 2010)
  - 66% dependent on control of other species (Scott et al. 2010)

Reducing conservation reliance through adaptive management

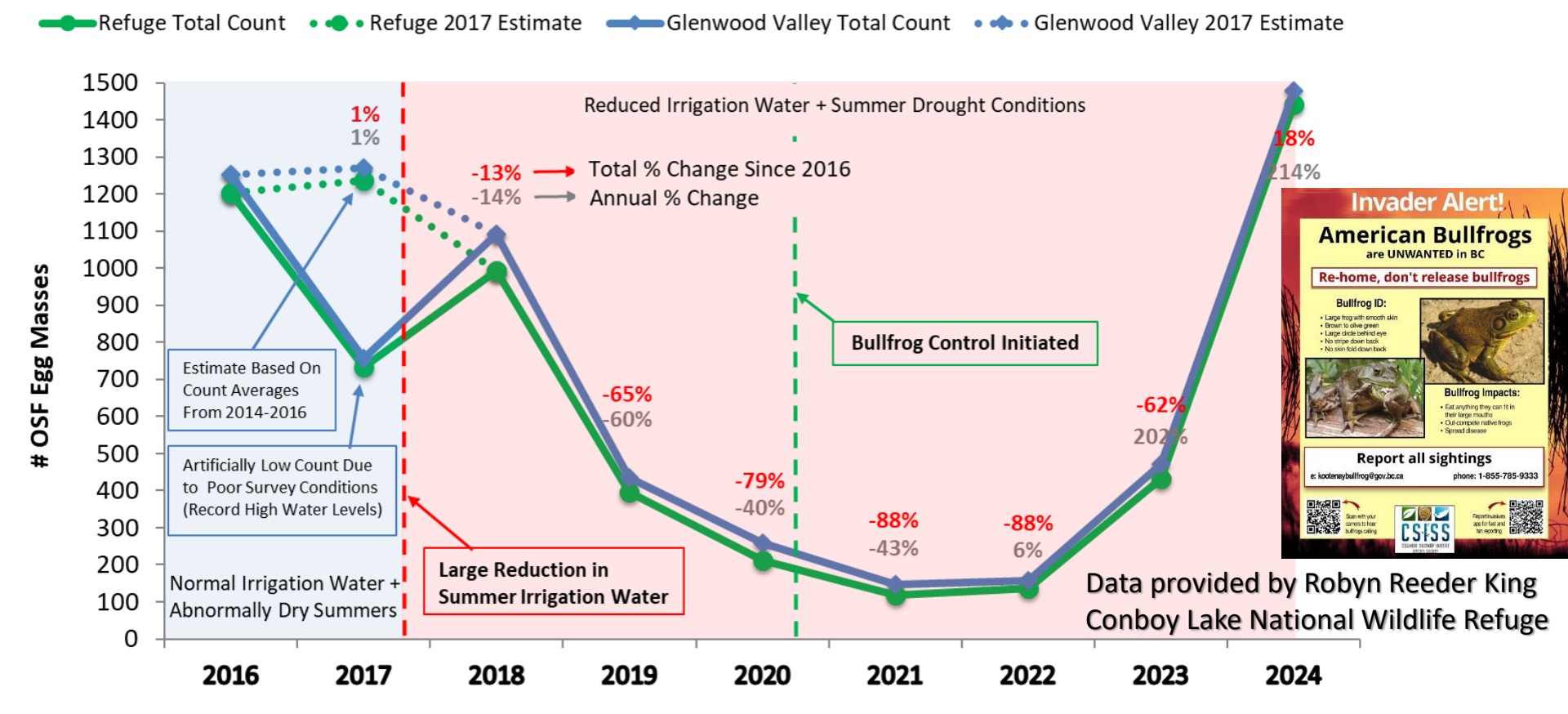
SMITHSONIAN'S NATIONAL ZOO & CONSERVATION BIOLOGY INSTITUTE

Visit Animals Support Membership Education

July 31, 2019

Kirtland's Warbler No Longer Needs Protection from Brown-Headed Cowbird in Michigan

For the past 40 years, brown-headed cowbirds have been trapped and killed in Michigan to prevent them from laying eggs in endangered Kirtland's warbler nests—causing warbler parents to care for cowbird chicks instead of their own chicks. A study published today in the Journal of Wildlife Management by scientists from the Smithsonian Migratory Bird Center and Utah State University found that Kirtland's warblers may no longer need the extra protection against parasitic brown-headed cowbirds. In 2018, cowbirds parasitized less than 1% of Kirtland's warbler nests in Michigan after scientists gradually removed cowbird traps during the previous three nesting sea



Data provided by Robyn Reeder King
Conboy Lake National Wildlife Refuge

Oregon spotted frog, state endangered/federally threatened

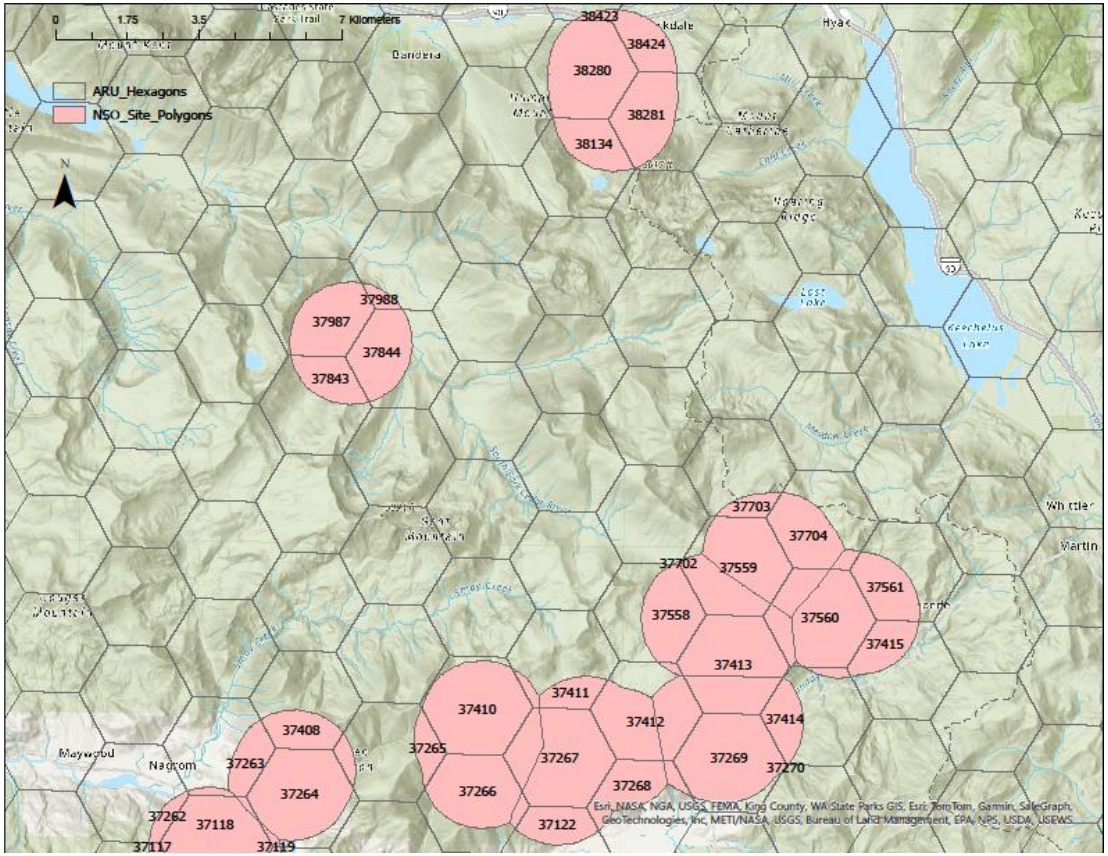
Northwestern pond turtle, state endangered/proposed federally threatened

Northern leopard frog, state endangered

Next steps

Where are the spotted owls in Washington?

- Working with partners to survey for remaining spotted owl territories
- Supplement information from USFS Northwest Forest Plan monitoring



Next steps

Finalize spotted owl augmentation feasibility assessment in 2025

- Identify next steps for spotted owl recovery including augmentation and barred owl management as tools

Barred owl diet study

- Are barred owls preying significantly on other SGCN in Washington?
  - e.g., western gray squirrels, pocket gophers, marbled murrelets…

Wrap up

- Biologists have arrived at this conclusion through careful and thoughtful consideration, backed by science.
- We know barred owl removal works. Without it, we will lose spotted owls in Washington and possibly other species.
- Beyond just spotted owls, science shows that barred owls have disproportionate disruptive effects on ecosystems (just like other invasive species). Old growth ecosystems are already threatened.
- Barred owls threaten to undermine the benefit created by old growth forest habitat protection policies.
- Conservation reliance can be reduced through adaptive management over time.
- As with any conservation challenge, government agencies cannot do this alone. It is a shared responsibility to steward and recover Washington's native wildlife and ecosystems. We won't get there without public support.

Questions and discussion

James Herndon