Draft Periodic Status Review of Western Gray Squirrels in Washington

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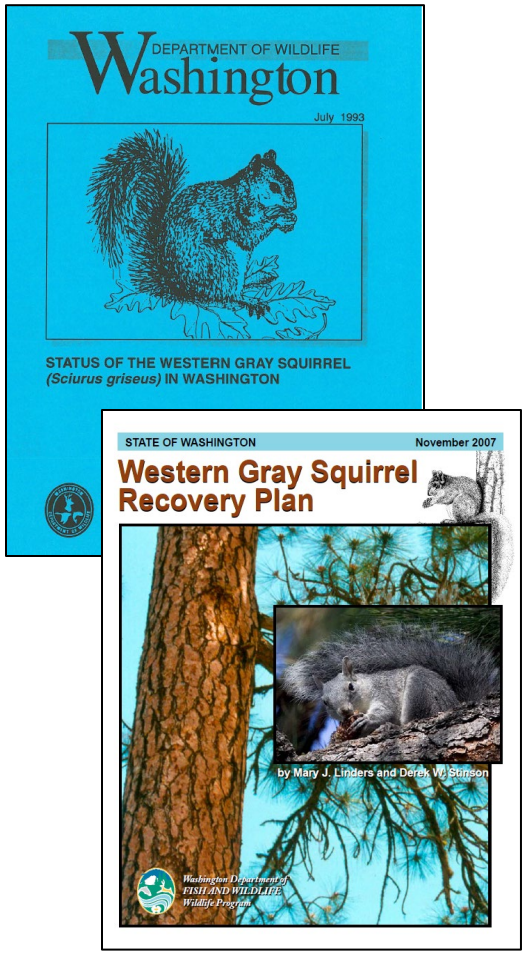
Draft Periodic Status Review: Process & Timeline

Listing Process Guided by WAC 220-610-110

- Periodic review of status every 5 years – last Western Gray Squirrel PSR 2016
- February 2020: solicit data and information from the public Prior to work on initial draft
- February 2023: 90-day public comment period on Draft
- Listing "…solely on the basis of the biological status of the species being considered, based on the preponderance of scientific data available."
- Threatened species is "… likely to become an endangered species within the foreseeable future throughout a significant portion of its range within the state without cooperative management or removal of threats"

Listing of Western Gray Squirrel

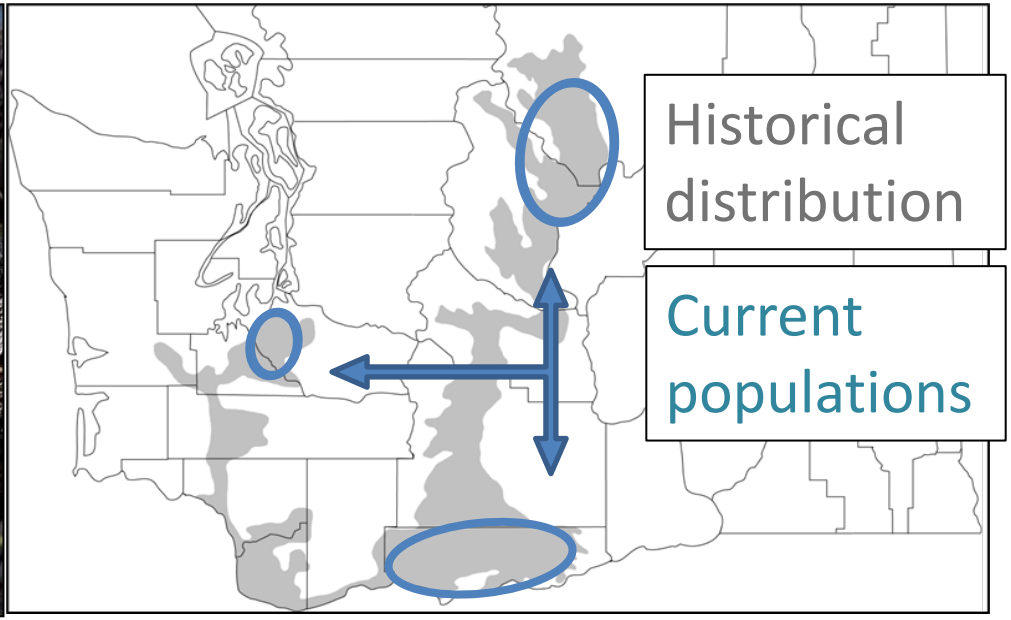


State

- **Threatened** since 1993
- Recovery plan 2007

Federal

- Proposed distinct population 2001
- Not warranted 2004



In Washington:

- Once uncommon to locally common across range
- Declining by the late 1800s and rare by 1970
- Now 3 isolated populations

Natural History

- Largest native tree squirrel in WA
- Arboreal and solitary
- One litter of 3 young annually (range 1-5)
- Often confused with the Eastern Gray Squirrel

Natural History

- Conifer-dominated stands often with adjacent hardwoods
- Stick nests for sleeping and resting, cavity nests for rearing young
- Forage on the ground and in trees for seeds, acorns, hypogeous fungi (truffles) and other foods

How are they doing?

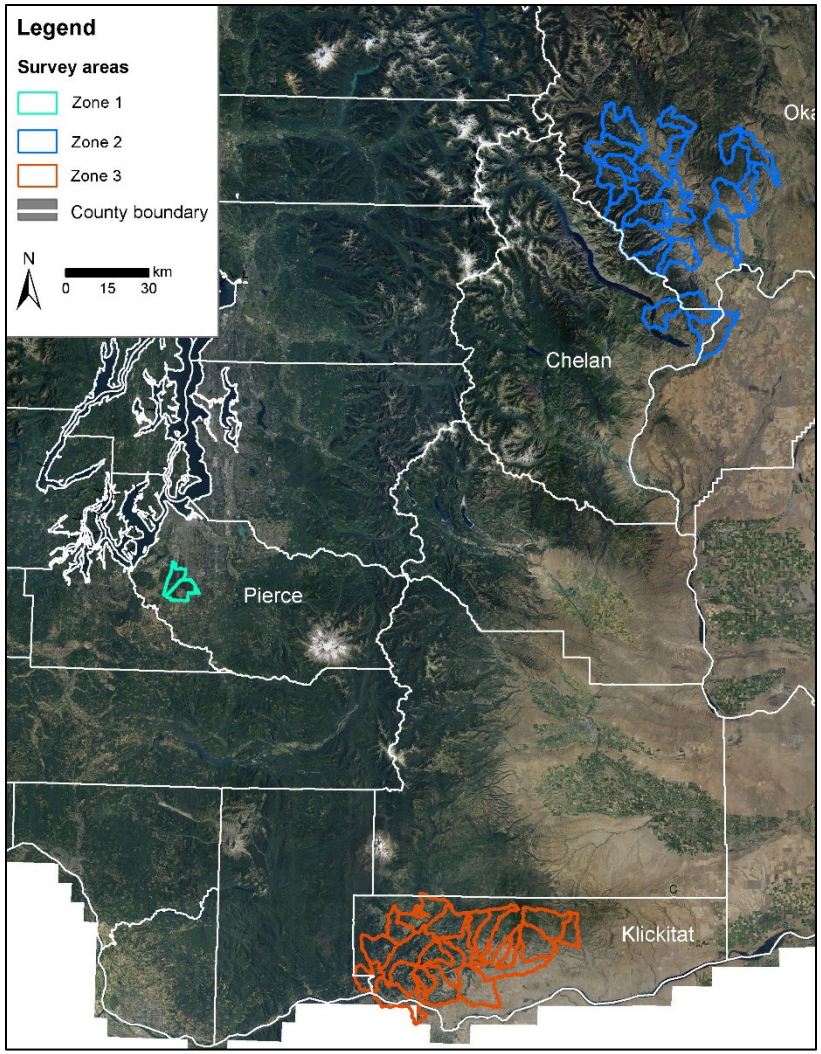
2 Strategies

- Estimate habitat occupancy
- Estimate habitat change since listing (1993)

Why this approach?

- Quantitative measures needed for the PSR
- Counting squirrels was not an option

Abundance (counting squirrels)



- Recovery plan: estimate of 937 ± 50% (range 468-1,405) squirrels in WA – NOT repeatable
  - Task 1: Develop a monitoring strategy
- Trapping grids (1-km^2): density highly variable (0.25 - 4.3 sqrls/ha) on KWA, Klickitat County
- Cost (data, $) of a repeatable population estimate was prohibitive and unsuccessful

New monitoring strategy

Hair tubes for occupancy; baseline for future trends

Occupancy Surveys

Methods developed 2015-2017 pilot project

- Adaptive cluster sampling
- Very low detection rates in peripheral areas; excluded these from final protocol

Occupancy surveys implemented 2018-2020

	# transects	Occupancy*	St Dev
Puget Trough	18	0.39	0.12
Klickitat	60	0.44	0.07
North Cascades	60	0.27	0.06

*detection probability was high (0.91, SE = 0.03)

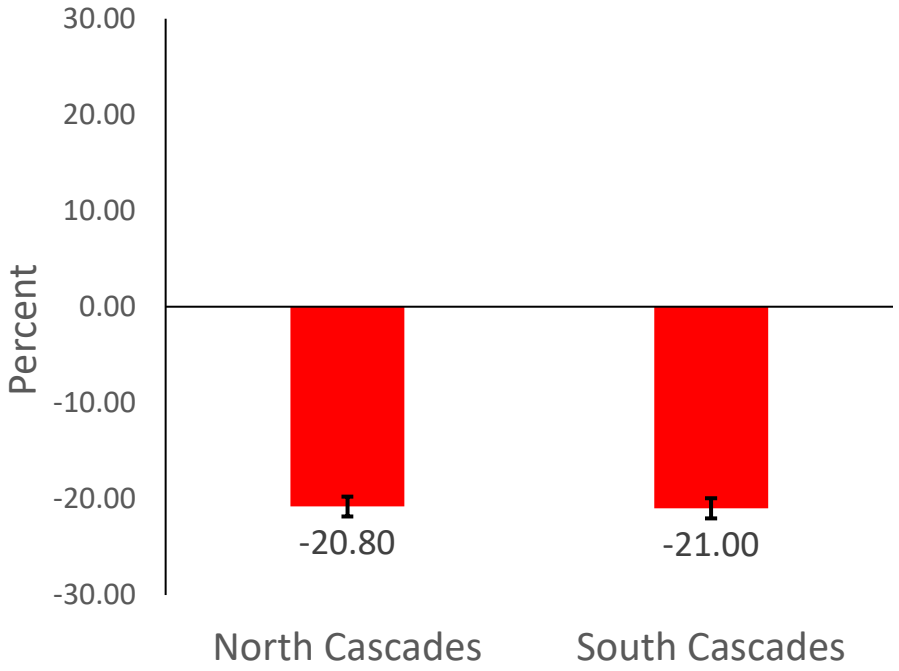
Habitat Change Analysis 1993-2017

Project objectives:

1. Estimate change in Primary habitat since listing (1993)
2. Estimate the relative contribution of different agents of change

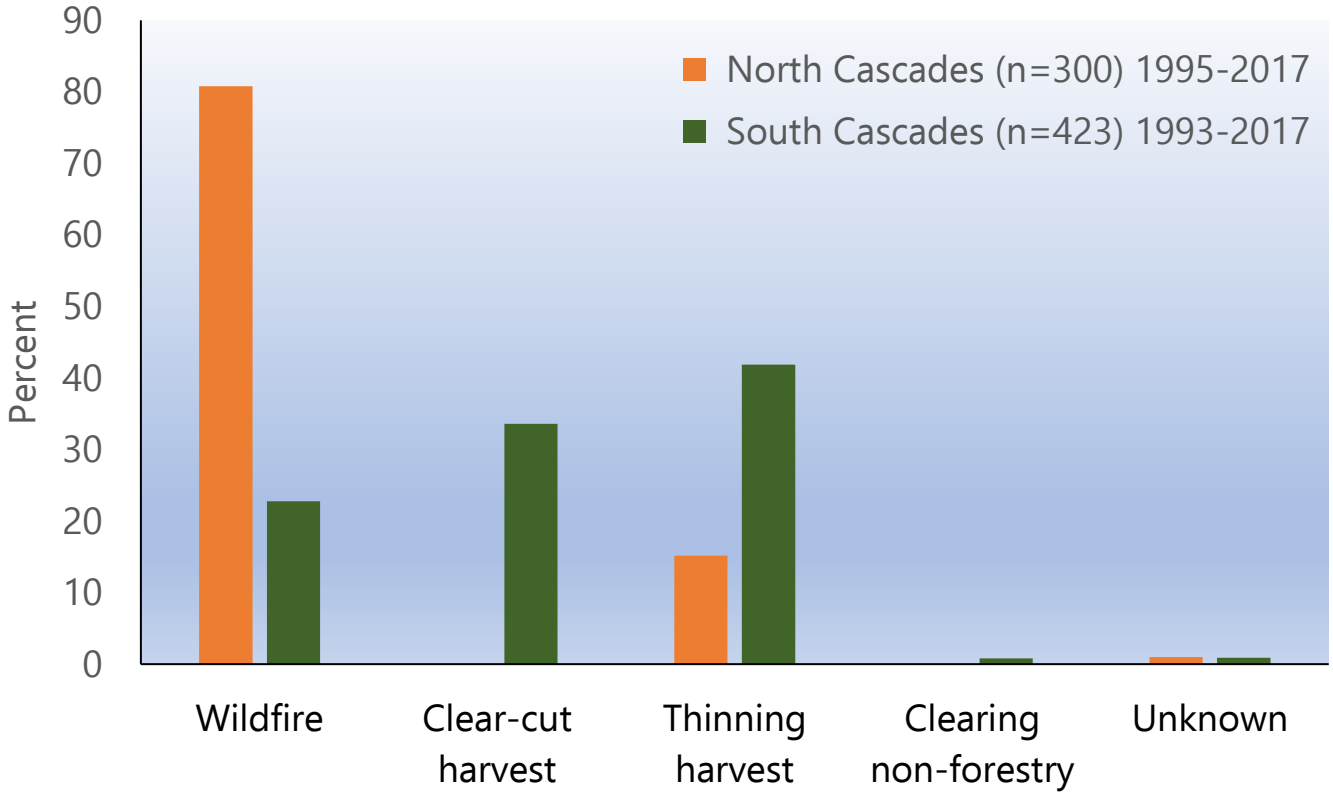
Net change in WGS Primary habitat: >20% decline

Gains in Primary habitat did not compensate for losses.



* 95% confidence interval

Agents of habitat loss



What is Primary Habitat?

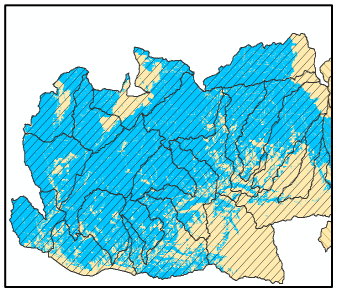
Research: most-used areas, include nesting and foraging.

- Tree canopy cover >40%
  - Ponderosa pine
  - Douglas-fir
  - Oregon white oak
- Large conifers, averaging >9" dbh with some >16" dbh
  - Nest and den sites
  - Seed production
- Connected canopy: ≥3 adj. crowns
  - Discrete nest access
  - Escape from predators

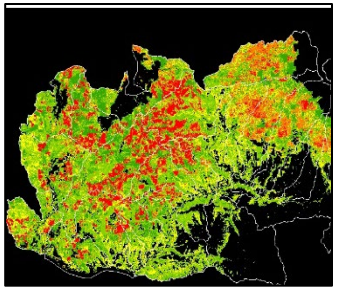
WDFW Priority Habitats and Species Management Recommendations

A hierarchical process to quantify habitat change

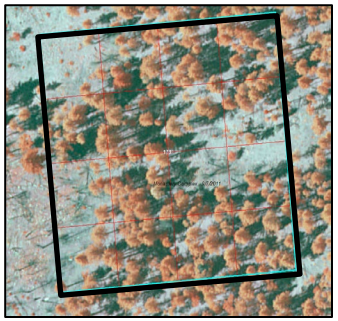
1. Course-scale: Identify potential Primary Habitat
   - 7 Ecological systems known to support WGS
   - Elevation cutoff at 4000’



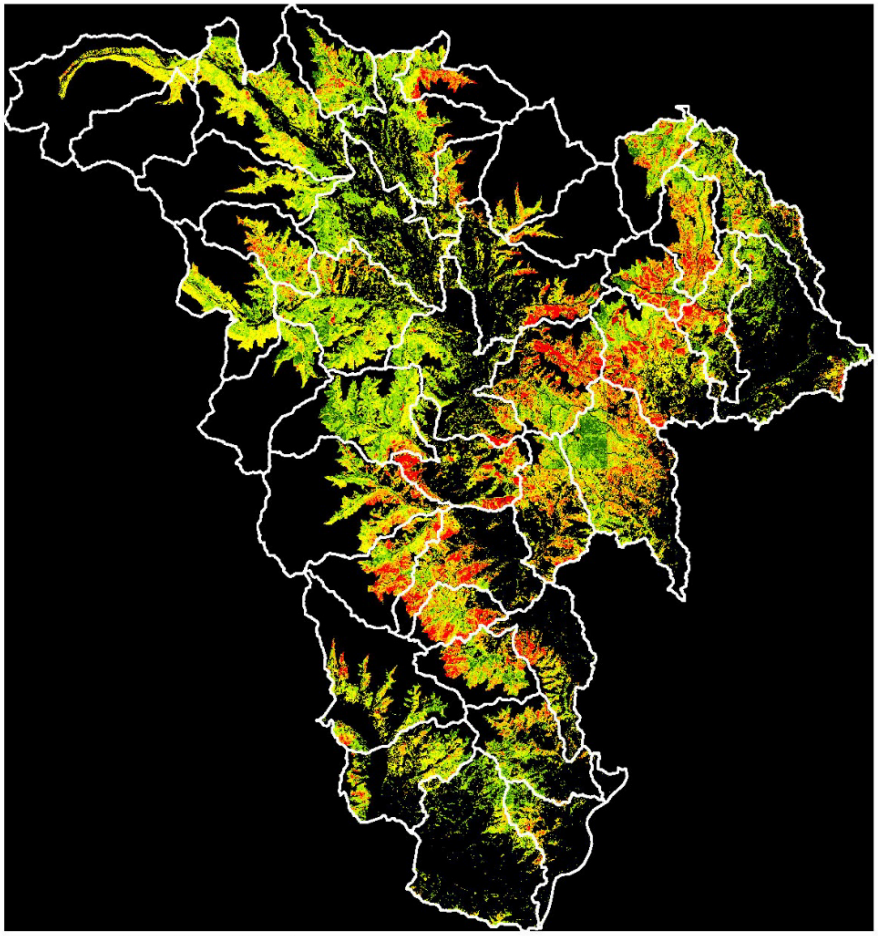
2. Meso-scale: Identify areas of change
   - Forest canopy cover change map (emapr; OSU)
   - Bin data (30-m pixel) into 5 classes to evaluate direction and scale

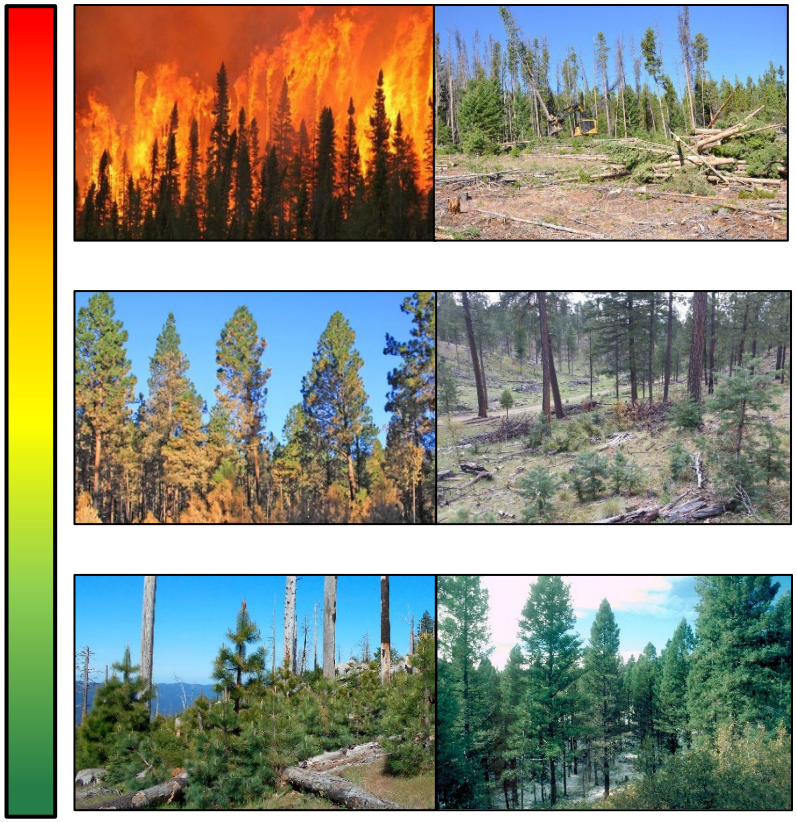


3. Fine-scale: nature and source of change
   - Compared (1-ha) orthophoto plots: 1993(1995) and 2017
   - 1000 random plots stratified by canopy change class
     - Aid in interpreting canopy change layer
     - Identify sources of change for extrapolation



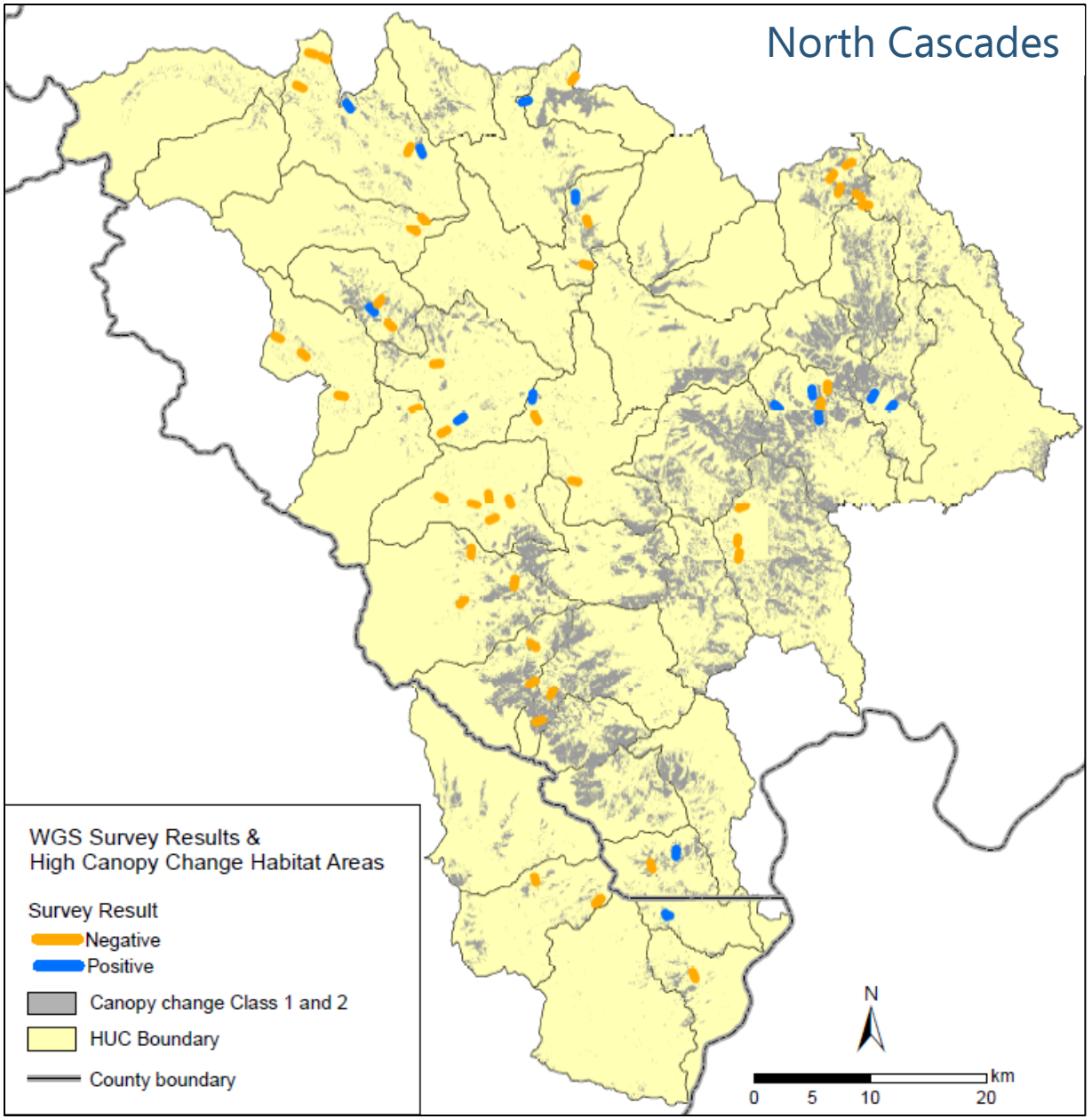
Canopy change layer
North Cascades project area





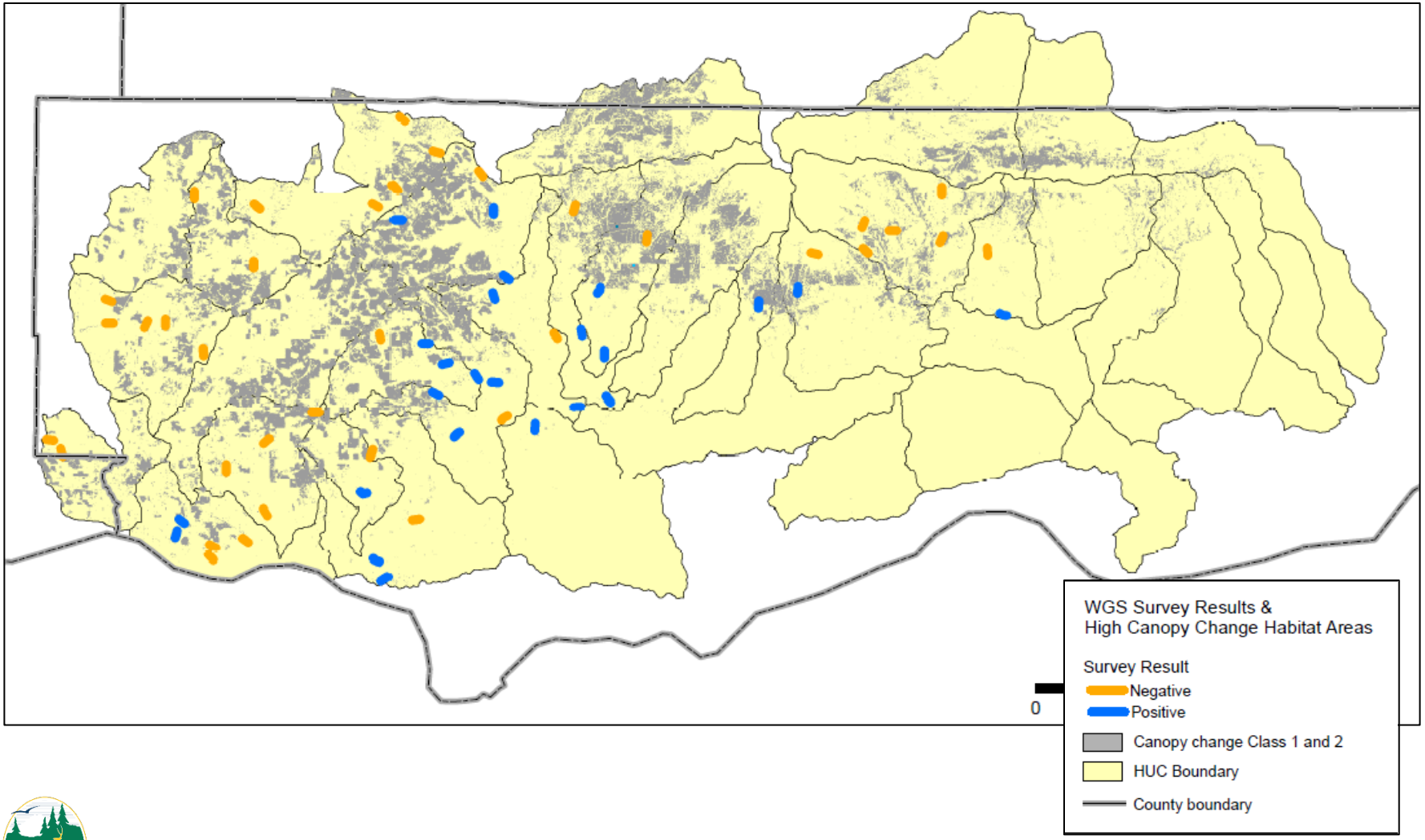
Occupancy survey results and habitat change

Change classes 1 and 2:
12-100% canopy loss
1993-2017



Occupancy survey results and habitat change

South Cascades



Factors affecting western gray squirrels

Habitat loss and degradation:

- Timber harvest
- Wildfire
- Land conversion
- Fire suppression

Habitat loss exacerbates:

- Small population size/isolation
- Disease
- Roadway mortality
- Climate change
- Interspecies competition

No state rules or enforceable guidelines for habitat retention. Only squirrels and nests are protected.

Conservation actions

- Hair tube surveys to delineate distribution
- Research: population parameters, resource selection, fire fuel treatments and competition with Eastern Gray Squirrels
- Augmentation of the Puget Trough population
- Updated PHS recommendations (2010)
- Voluntary management plans
- Habitat restoration:
  - Fire fuels treatments
  - Oregon white oak

Conclusions

- Squirrel occupancy appears low and fragmented.
- Primary habitat for Western Gray Squirrels in the Cascades has declined >20% since listing.
- Frequency and severity of wildfires are increasing with climate change.
- Current harvest rotation lengths in the South Cascades (35-45 years) likely limit availability of suitable stand structures.
- Tree replacement takes decades.

Summary

- Western gray squirrel populations in WA disjunct and fragmented.
- Habitat loss and fragmentation, key factors in 1993 listing decision, are increasing.

Recommendation:

It is recommended the species be uplisted to Endangered:

"...seriously threatened with extinction throughout all or a significant portion of its range within the state (WAC 220-610-110 [2.4])"

Public comments

227 comments

- 22 agreed uplisting
  - Wildlife Diversity Advisory Council (WDAC)
  - 1 out of context
- 181 disagreed uplisting
  - 155 version of same form letter (10 out of context)
  - 26 independent comments (4 out of context)
- 24 other
  - 4 technical: favored increased cooperation to obtain more data
  - 20 out of context

Questions?

Acknowledgements

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