

# Sounding the alarm: Rare lichens may be rapidly declining in the Pacific Northwest

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# Lichens

- Important component of biodiversity
- Key roles in nutrient cycling
- Support wildlife
- How do lichens respond to global change?





# Old-growth forests

- Lichen diversity hot spots
- Numerous old-growth obligate lichens

## Natureserve conservation status rankings

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- G1: Critically imperilled
- G2: Imperilled
- G3: Vulnerable
- G4: Apparently secure
- G5: Secure

# Old-growth obligate lichens

Nephroma occultum (G4)

Sticta weigeli (G5)

Pseudocyphellaria rainierensis (G4)

Pseudocyphellaria mallota (G4)

Usnea longissima (G5)

*Are they as secure as we assume?*

# Threats to lichens



Climate change



Habitat loss



Air pollution



Severe fires



# Lichen extirpations

- Many examples esp. in eastern US
- More resilient western lichens?
- Very little rare lichen monitoring

# Recent severe wildfires in Oregon

- Beachie Creek fire burns Opal Creek ancient forest
- Many rare lichen populations burn







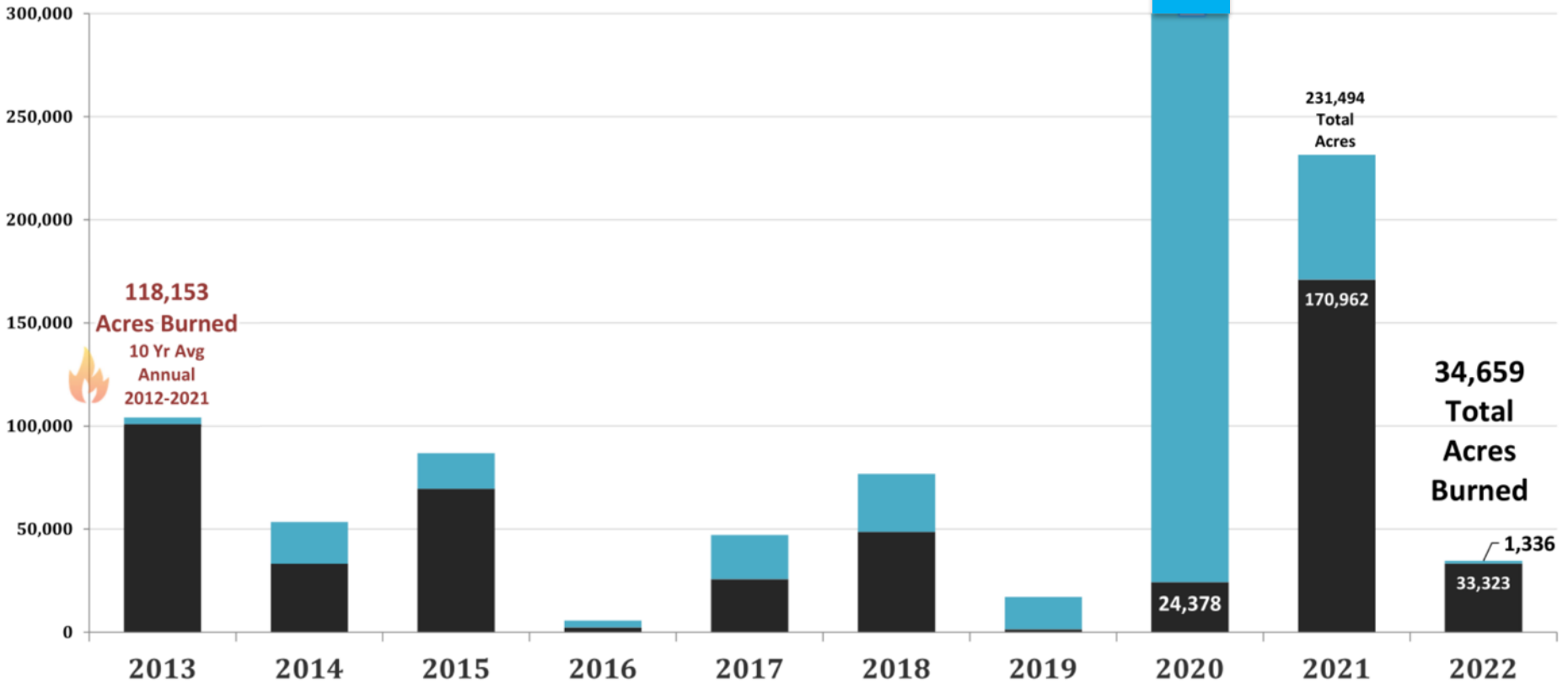
# Oregon Department of Forestry Protected Acres Burned 2013-2022

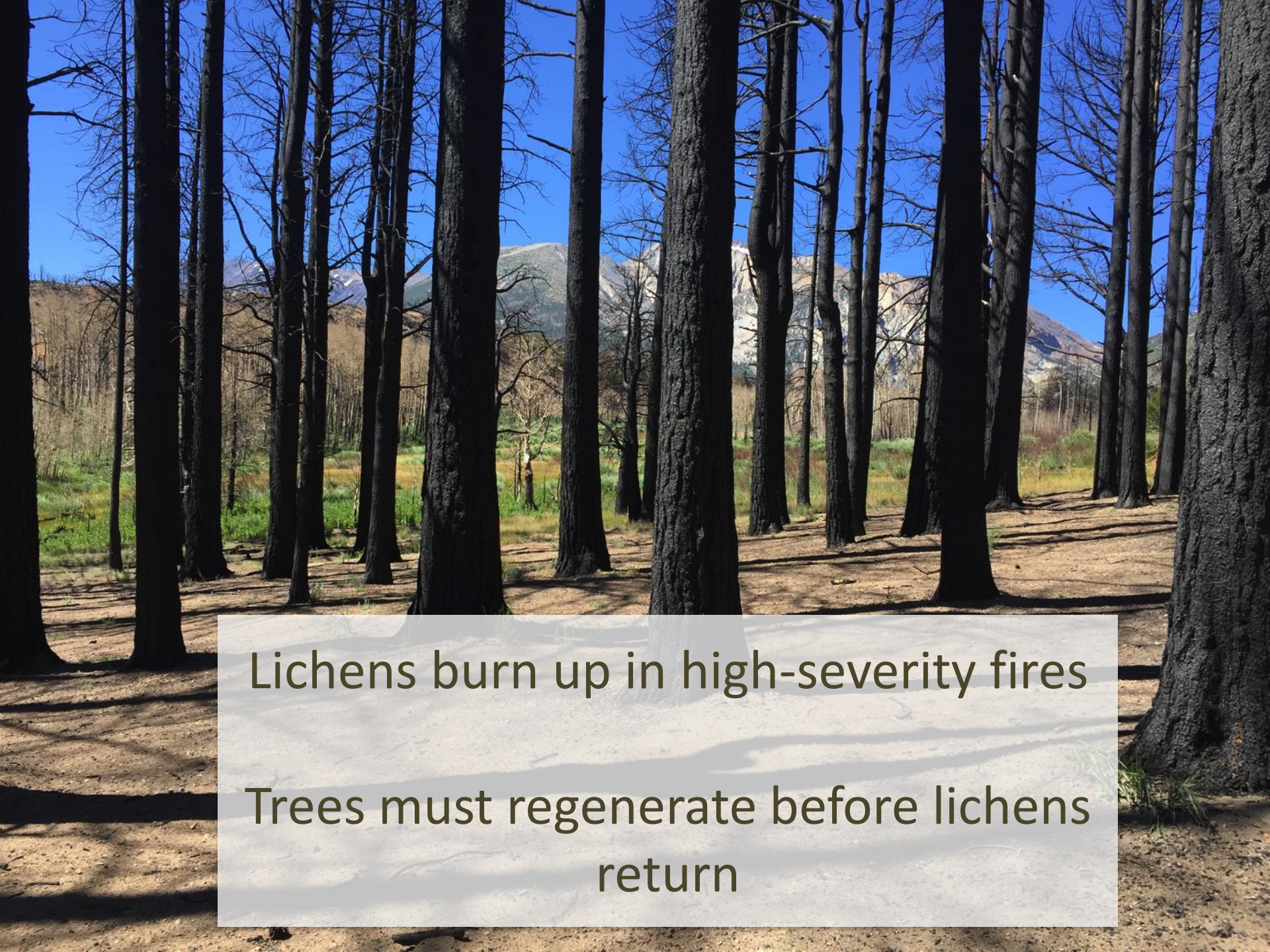
ODF Fire Intel. Data 1/06/2023.

Fires Under Investigation are accounted for in Human Category.

■ Lightning ■ Human


Protected  
Acres






Lichens burn up in high-severity fires

Trees must regenerate before lichens  
return



Have a regionally significant number of rare lichen populations been lost in recent fires?



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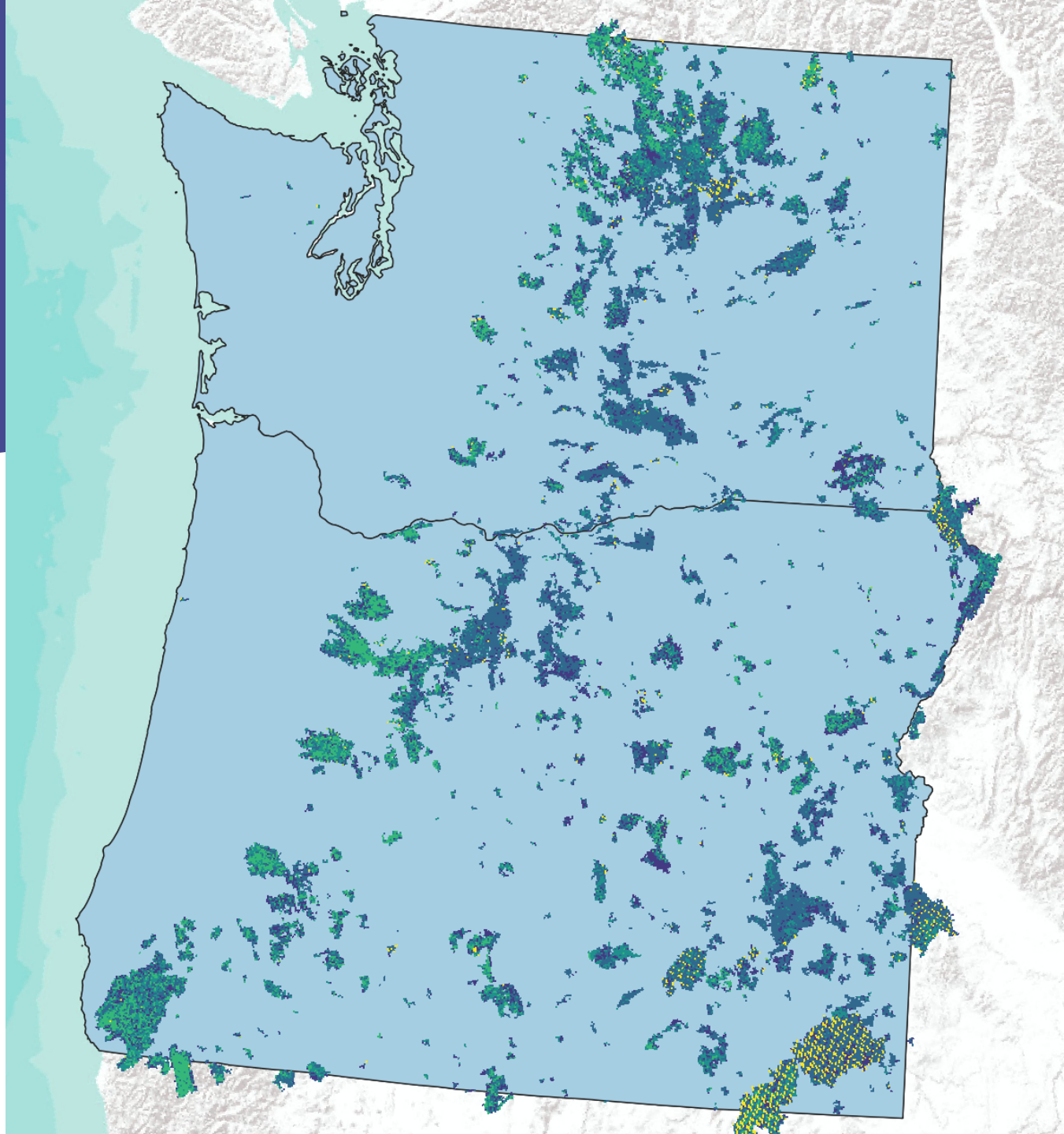
Do we need to adjust lichen conservation status rankings due to populations lost from fire?



# Methods

- Lichen occurrence records from Consortium of North American Lichen Herbaria ([cnaah.org](http://cnaah.org))
- Fire records from Monitoring Trends in Burn Severity ([mtbs.gov](http://mtbs.gov))

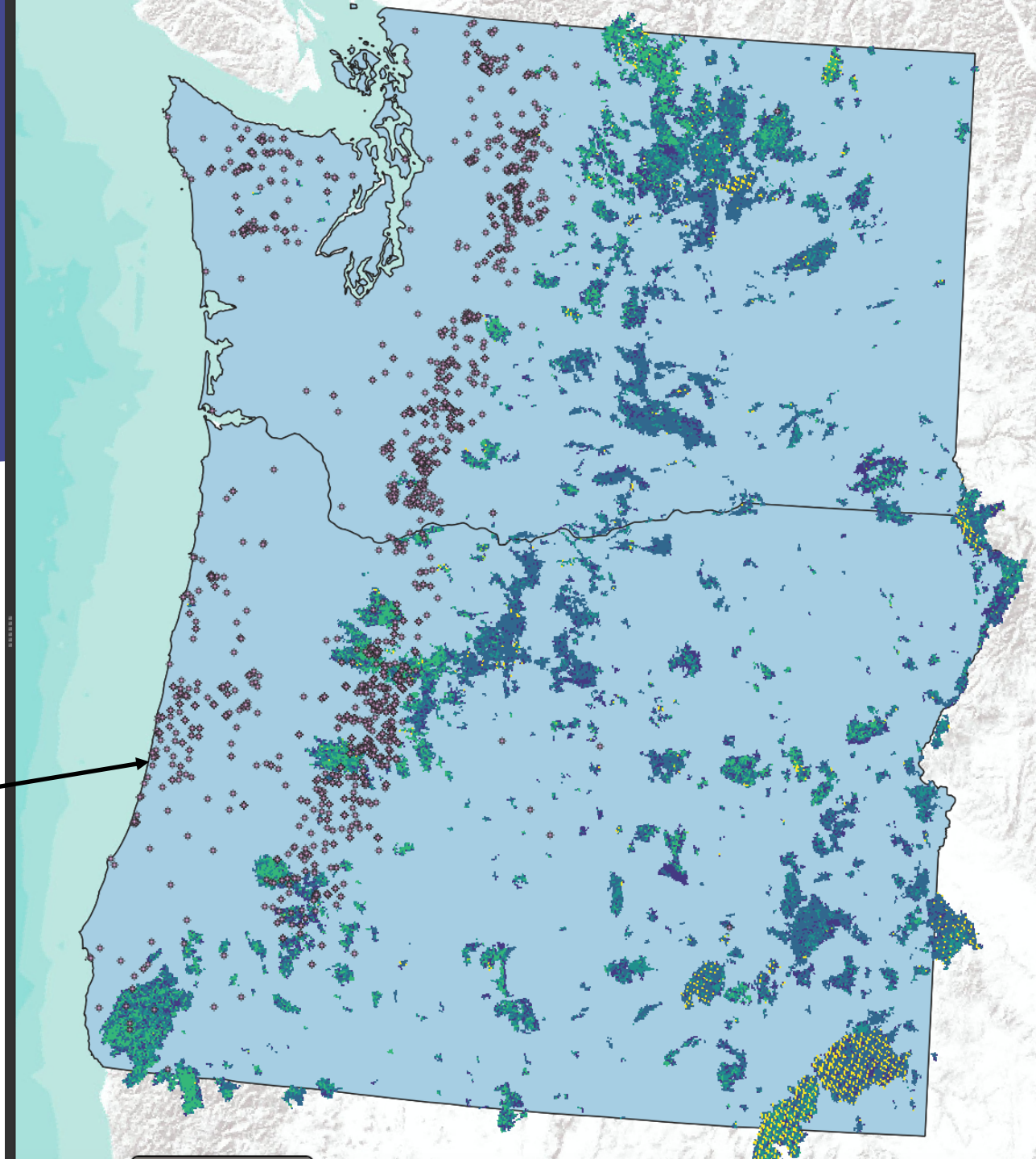
# Fires 2000-2020



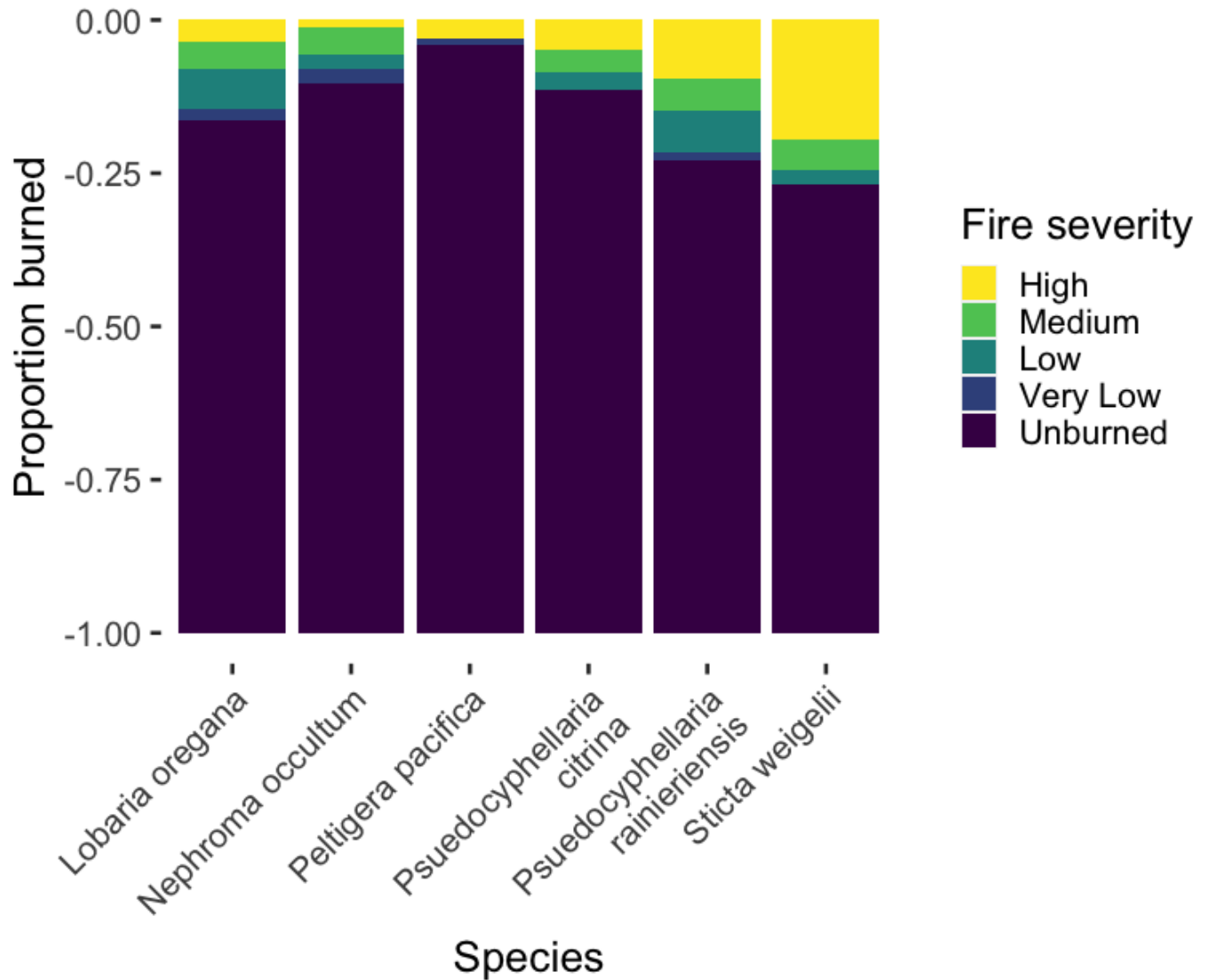
Fires 2000-2020

Looking forward –  
more fire in  
Washington?  
Coast ranges?


Stands with old-growth  
character, based on  
lichens



# Proportion of populations burned in Oregon







Fire is not the only cause of  
lichen extirpations

Extinction debt in fragmented forests

# Looking forward



British Columbia already set record for annual area burned in 2023



Is Washington next?



Lichens will continue to burn—focus on what we can do

# In the vascular plant world

Outplantings are common for rare plants





# Lichen conservation

- Monitoring
- Reintroductions /  
translocations
- Forest management
- Federal listing under  
the Endangered  
Species Act

# Questions?

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