Lichen of the Willamette Valley, Linn County, Oregon

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What are lichen?

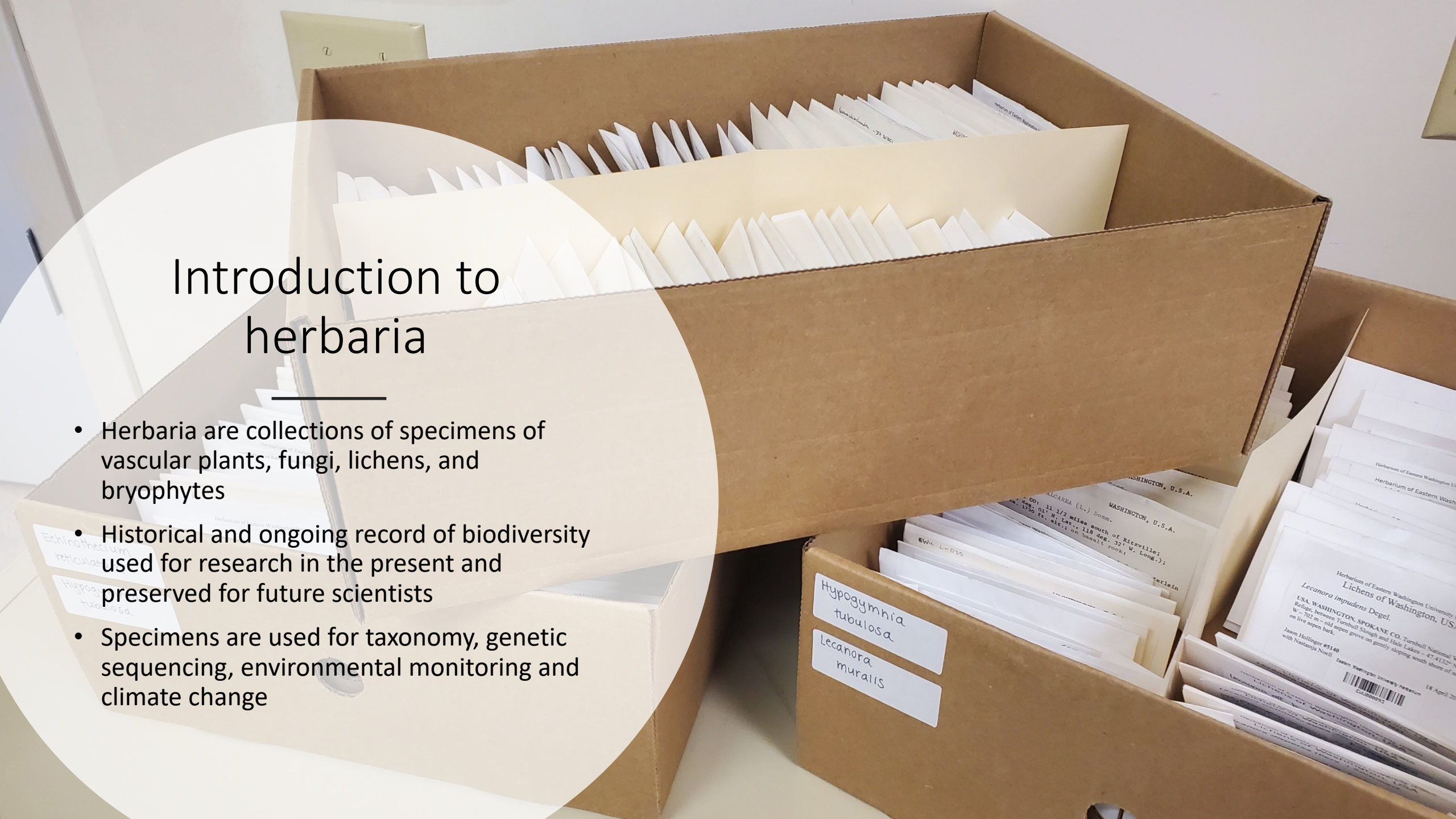
- Lichen are composite organisms
  - A fungal partner and an algal partner form a symbiotic relationship
  - The fungus cannot make its own food, so relies on the alga for photosynthesis
  - In return, the fungus provides a protected, controlled environment for the alga to live in

Why lichen?

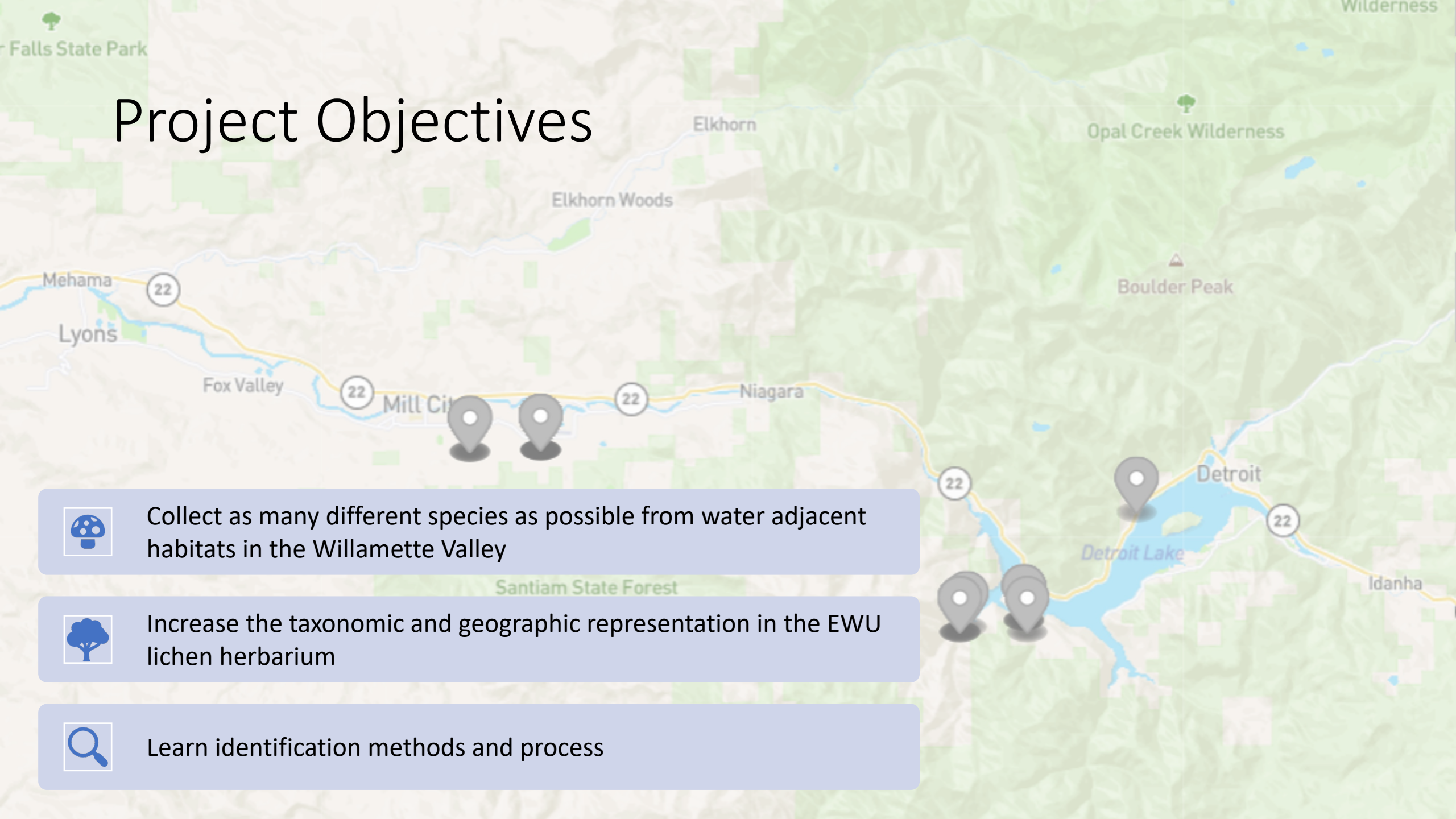
- Found in every terrestrial ecosystem on Earth
- An important part of the food chain
- Ecosystem indicators (pollution, etc.)
- Nitrogen contributors, replenish soil through matter breakdown

Introduction to herbaria

- Herbaria are collections of specimens of vascular plants, fungi, lichens, and bryophytes
- Historical and ongoing record of biodiversity used for research in the present and preserved for future scientists
- Specimens are used for taxonomy, genetic sequencing, environmental monitoring and climate change



Project Objectives



- Collect as many different species as possible from water adjacent habitats in the Willamette Valley
- Increase the taxonomic and geographic representation in the EWU lichen herbarium
- Learn identification methods and process

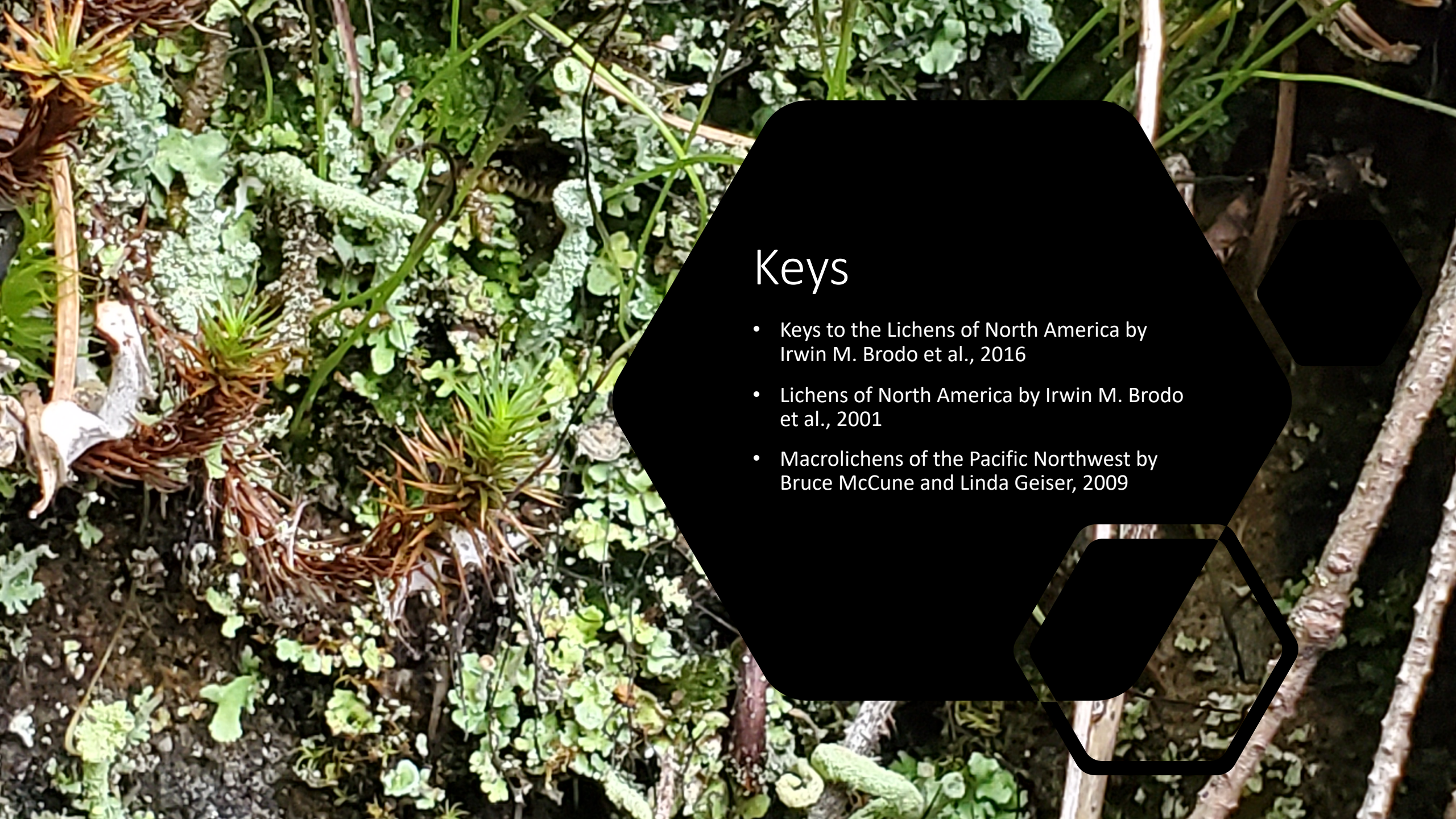




Collection strategy

- Choose a site of interest
- Conduct field observations looking for unique specimens
  - Look at all substrates (trees, soil, rock) and microhabitats
  - Collect representative samples of all unique species found

Identification methods

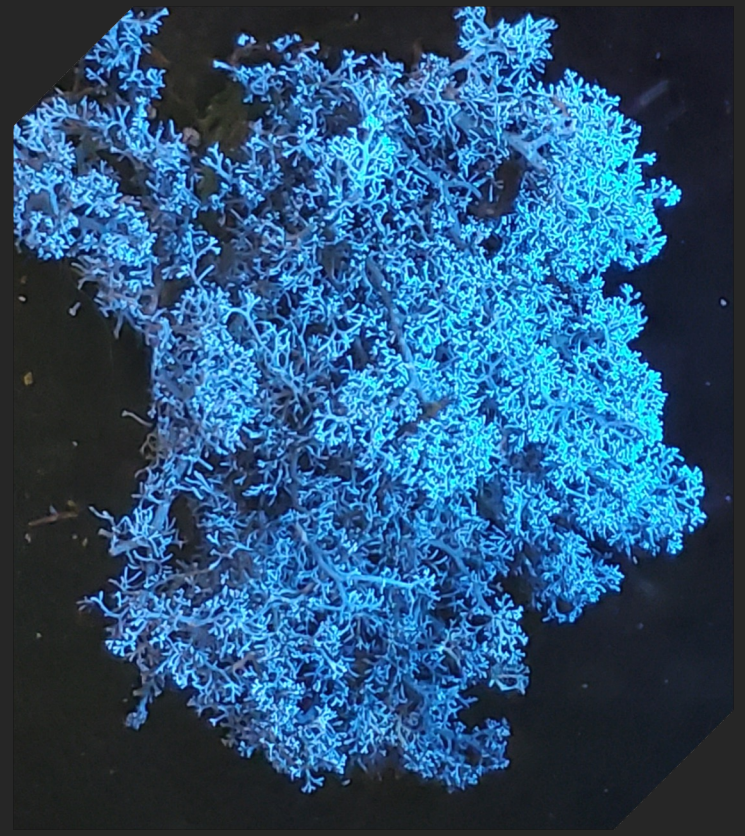


Keys

- Keys to the Lichens of North America by Irwin M. Brodo et al., 2016
- Lichens of North America by Irwin M. Brodo et al., 2001
- Macrolichens of the Pacific Northwest by Bruce McCune and Linda Geiser, 2009

Spot Tests

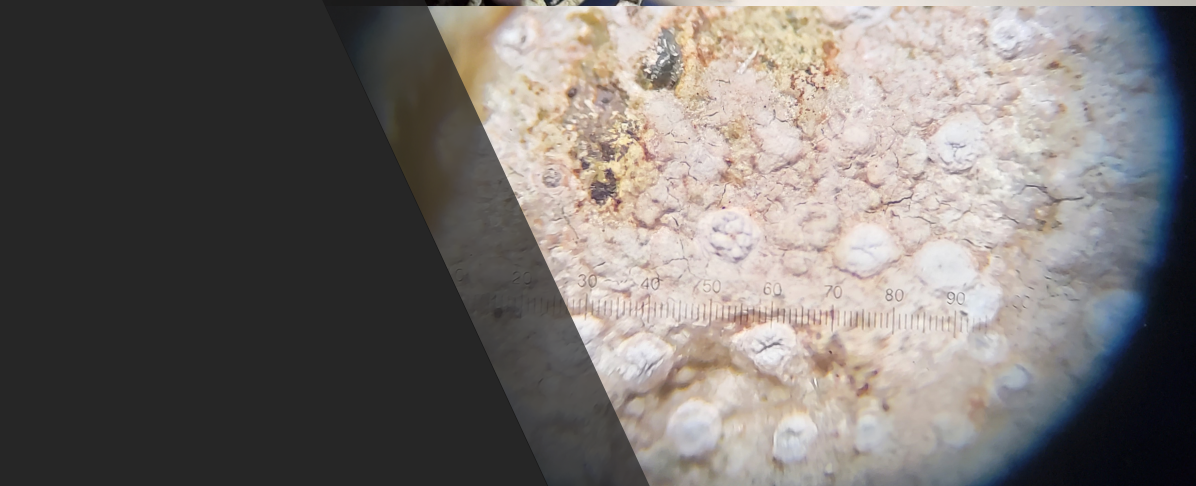
- K, C, KC, CK, P, IKI, N

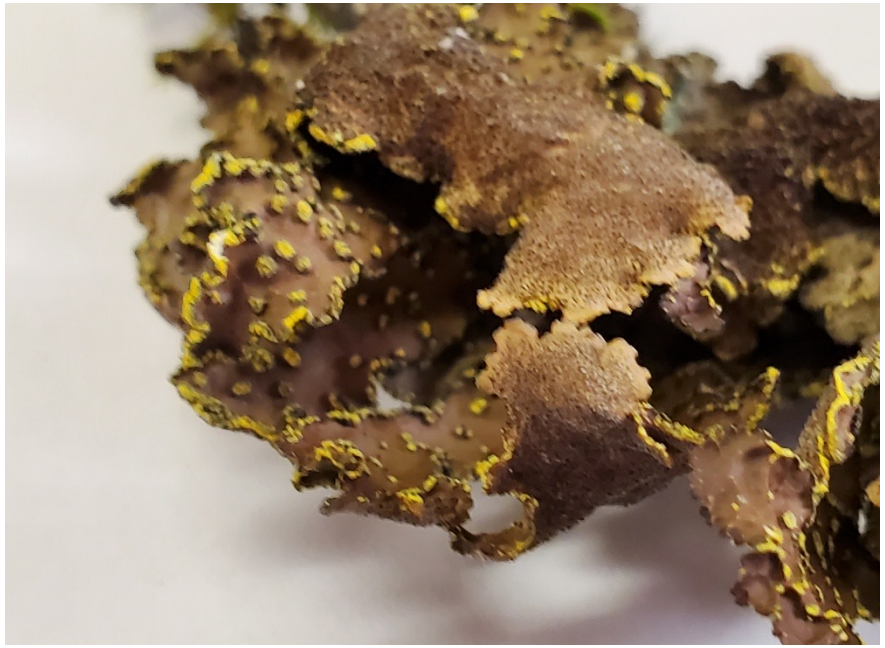


Ultraviolet light

Morphology

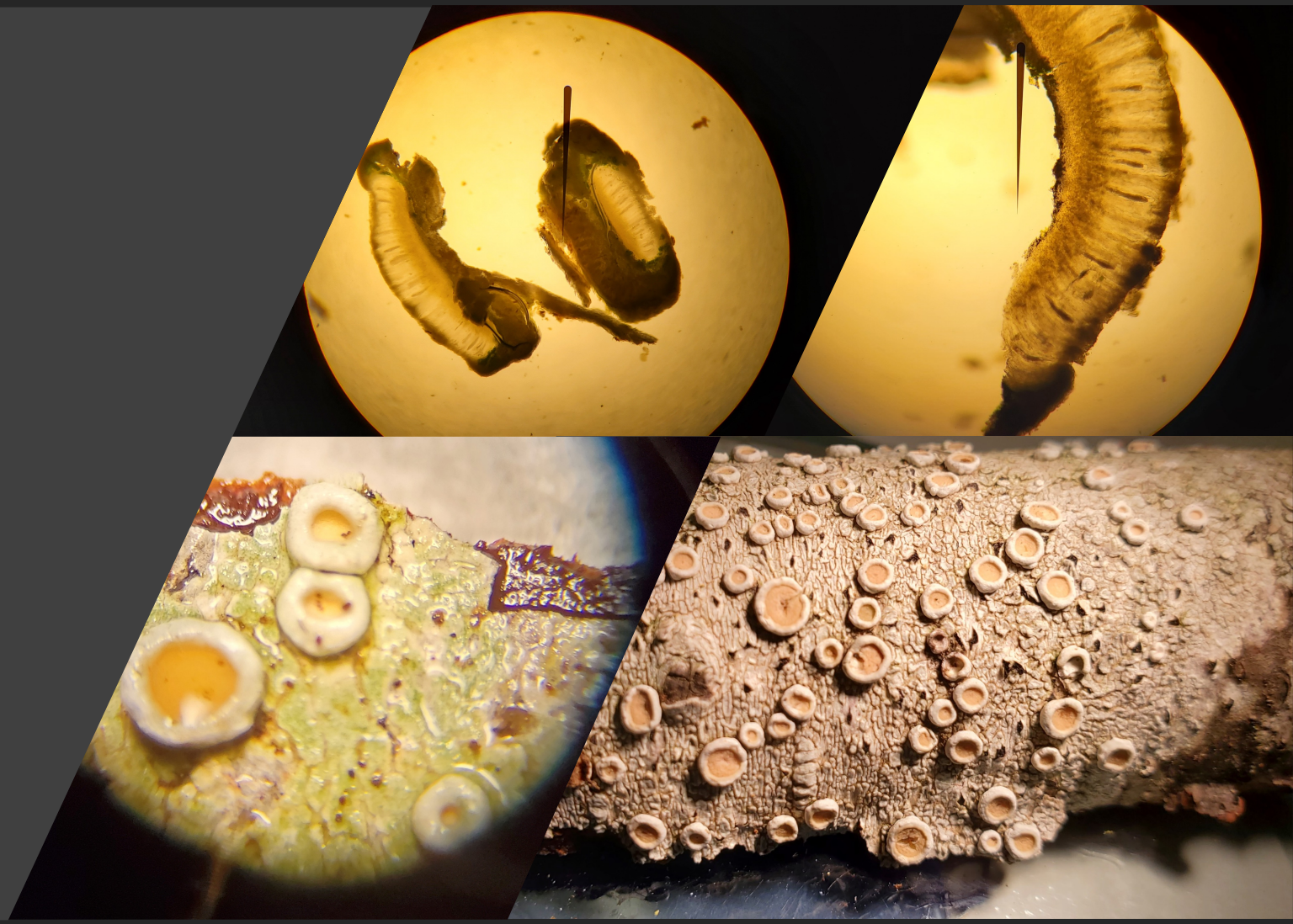
- Foliose
- Fruticose
- Crustose





Cortex structure

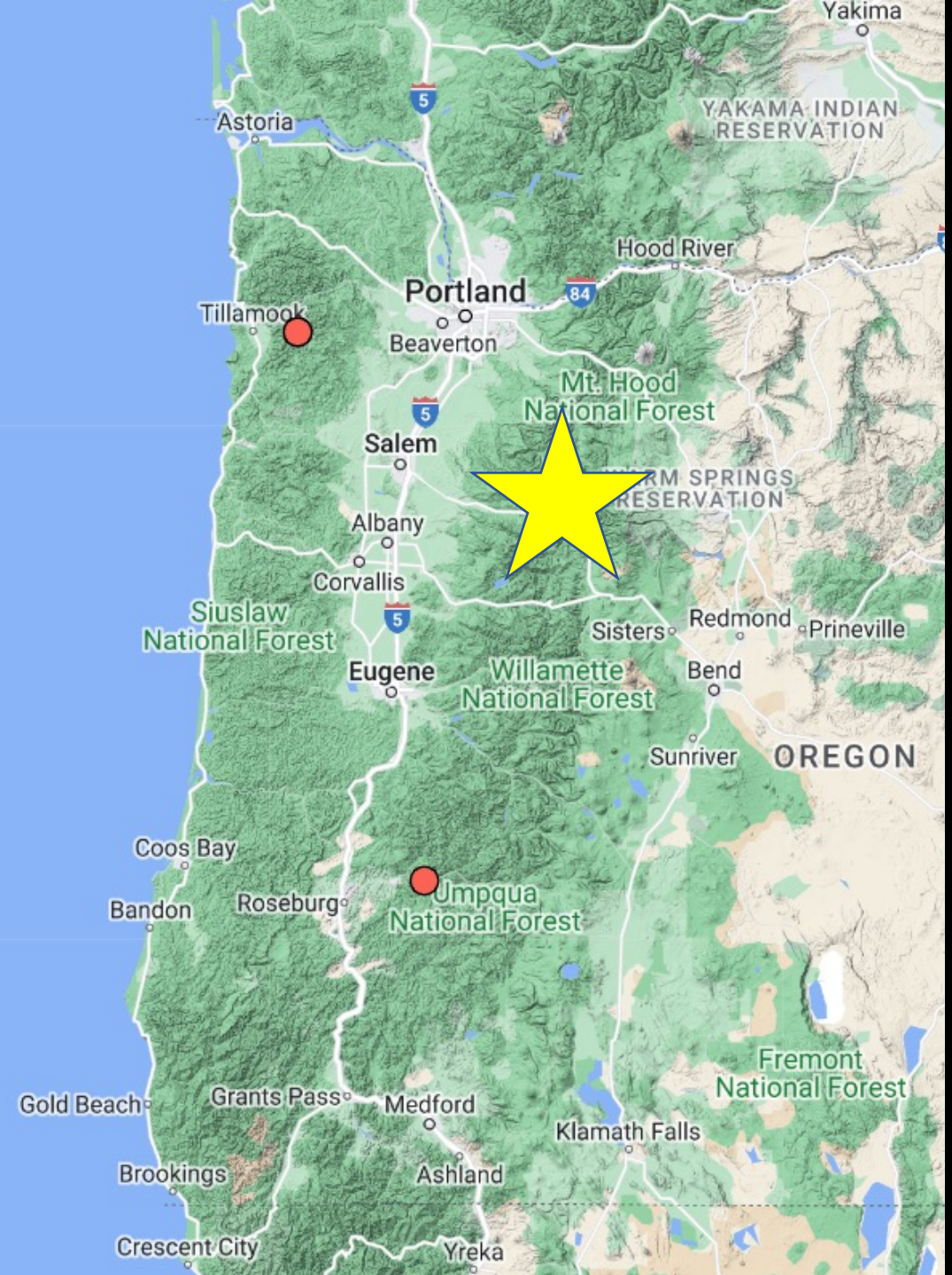
Reproductive Structures



Apothecia

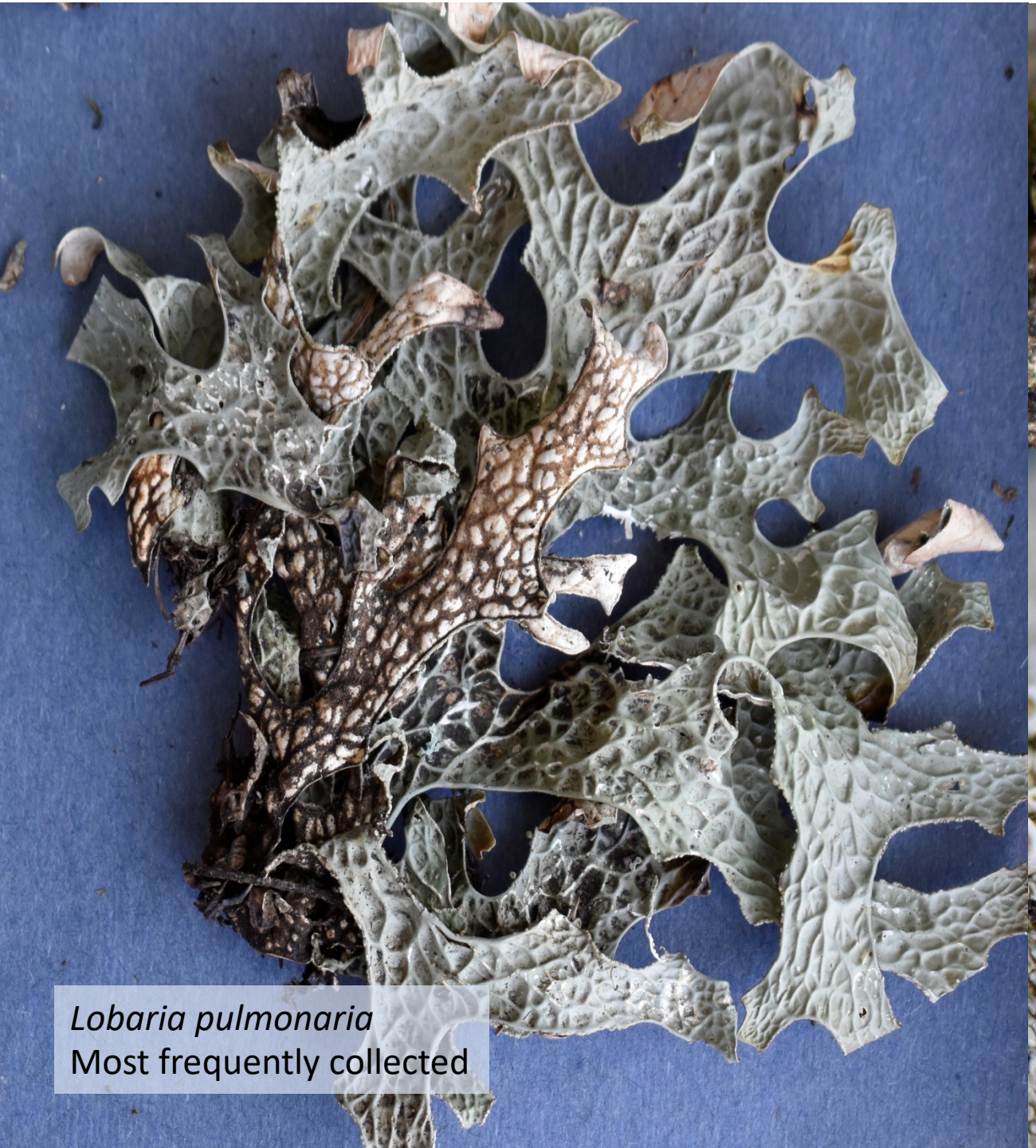
Asci and Spore structure

Soredia
Isidia

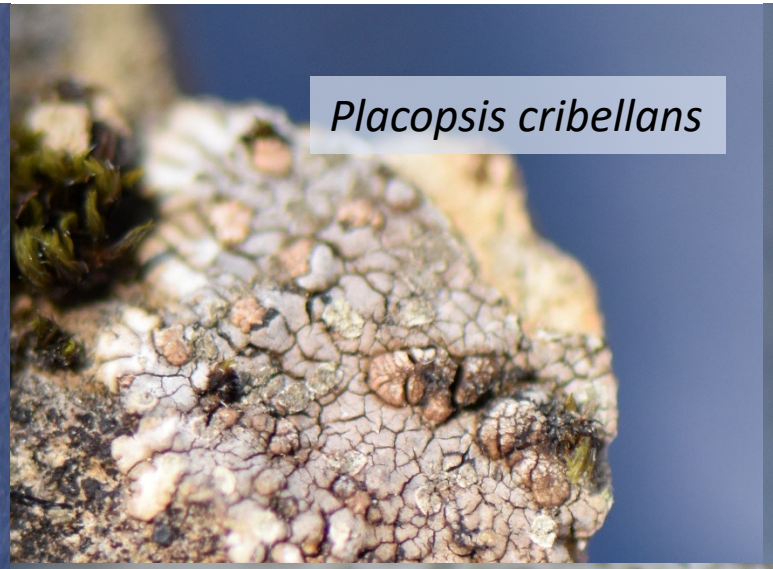


Preliminary Results

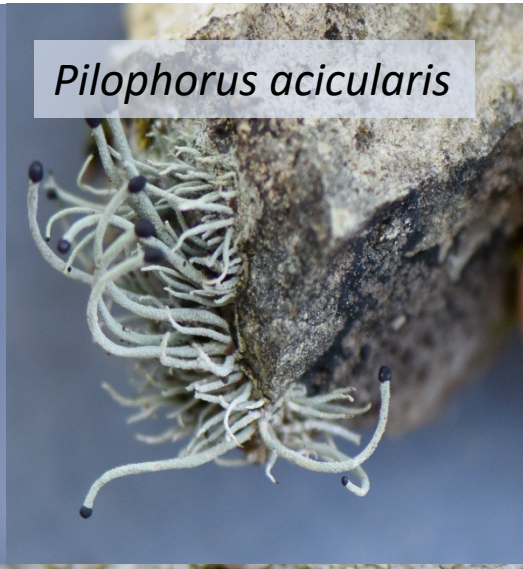
- 79 samples
- 20 identified
- 16 species found
- 8 are unique species not in the EWU Herbarium



Lobaria pulmonaria
Most frequently collected



Placopsis cribellans



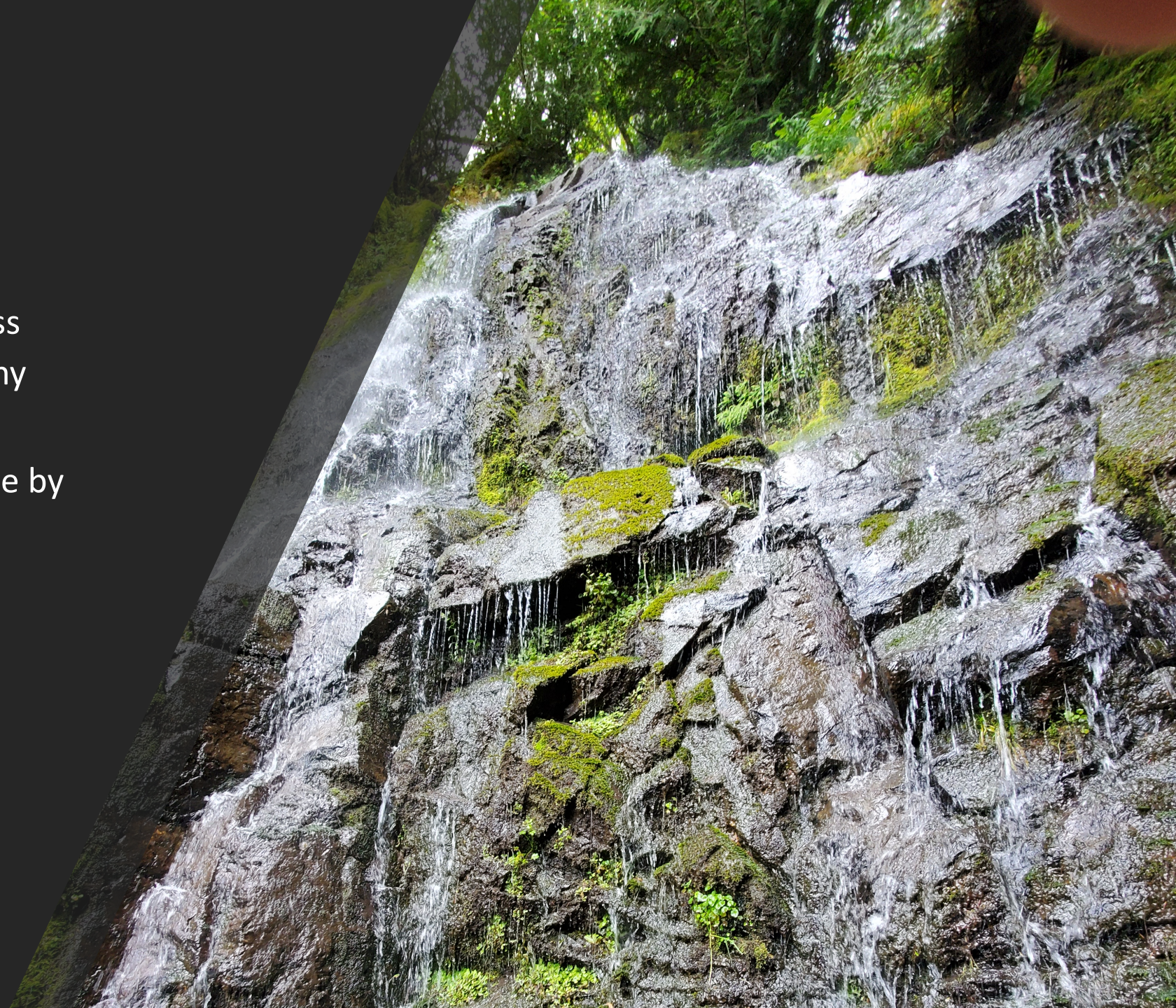
Pilophorus acicularis

Ochrolechia oregonensis

Usnea longissimum

Next Steps

- Continue identification process
  - Thin-layer chromatography
  - DNA Barcoding
- Deposit into Herbarium for use by future researchers



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References

- Brodo, I. M., et al. *Keys to the Lichens of North America.* (2016) Yale University Press, New Haven, CT.
- Brodo, I. M., et al. *Lichens of North America.* (2001) Yale University Press, New Haven, CT.
- McCune, B., and Geiser, L. *Macrolichens of the Pacific Northwest.* (2009) Oregon State University Press, Corvallis OR.