Defining the "Coarse Filter" with The U.S. National Vegetation Classification

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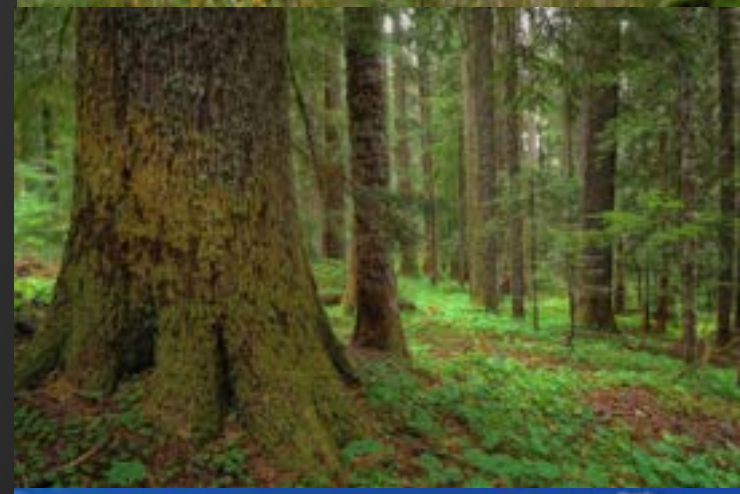
WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES



Photos by Joe Rocchio & Tynan Ramm-Granberg unless otherwise noted

Outline

Our Mission

Ecosystem Conservation Priorities

- Defining ecosystem targets
- Prioritization
- Conservation Action!

Global Linkages & Applications

Our Mission

Natural Area Preserves Act 1972

Maintain a natural heritage program to:

- Select natural areas
- Classify, inventory, and track biodiversity.
- Inform decision making.

Abronia umbellata (Pink sand verbena)
State Endangered

WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES

Natural Heritage Program

"Connect conservation science with conservation action"

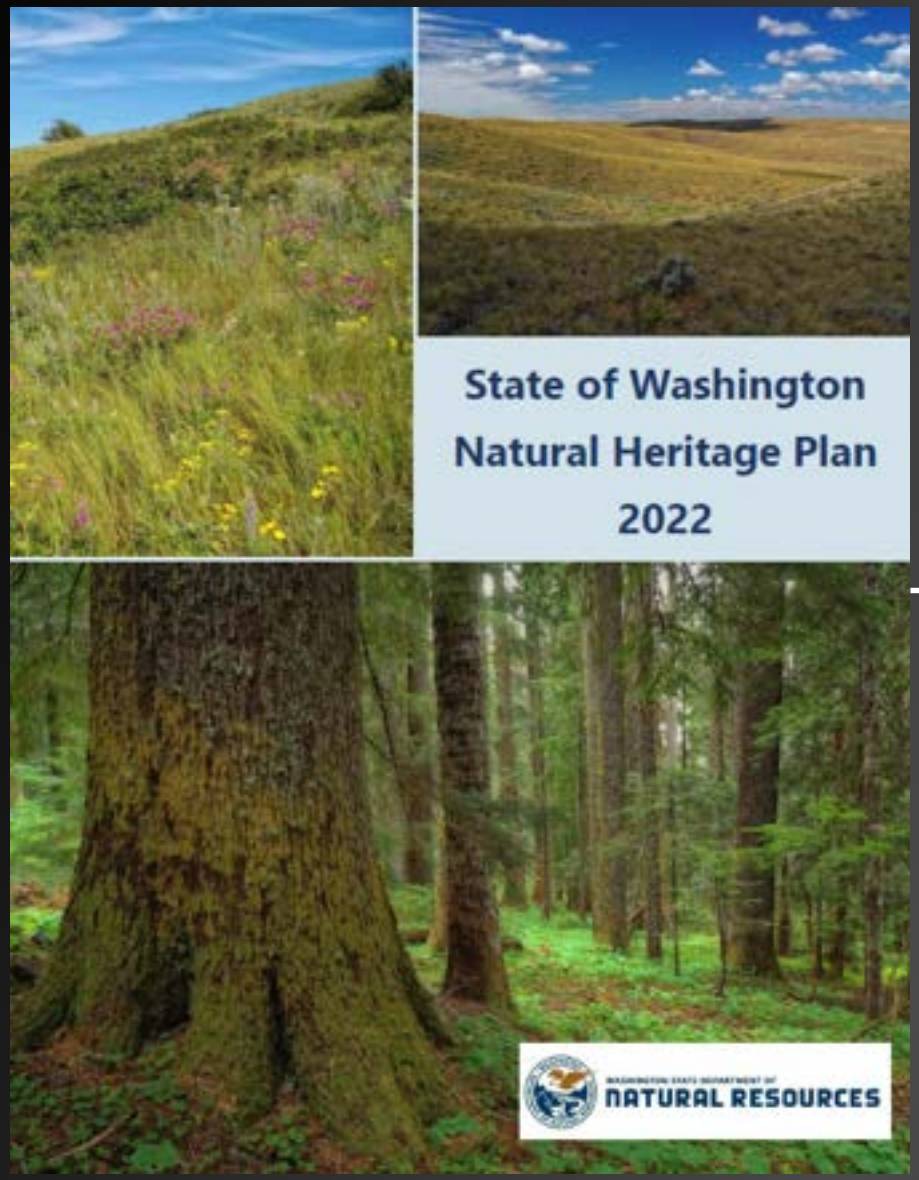
- Provide scientific expertise and information for effective conservation of Washington's natural heritage.
- WNHP established in 1977 as joint venture between The Nature Conservancy & State of Washington
- State legislature established WNHP within DNR in 1981

Idaho fescue / bluebunch wheatgrass Prairie
State Imperiled
Pataha Bunchgrass Research Natural Area (USFS)

WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES

Natural Heritage Program Goals

- Classify Biodiversity
- Map Biodiversity
- Assess Biodiversity Status & Threats
- Set Conservation Priorities
- Distribute Data



https://www.dnr.wa.gov/NHPconservation

Step 1: Classify biodiversity features

Step 2: Determine imperilment of biodiversity features

Step 3: Assign State Conservation Status

Step 4: Assign Natural Area Representation Priorities

Inform land use decision

Guide natural area designations

Defining Ecosystem Conservation Targets

Step 1: Ecosystem Classification

- What factors do you want in your ecosystem classification?

Disturbance

Flexible Scale

Soil

Climate

Aquatic or Terrestrial?

Species Composition

Growth Form

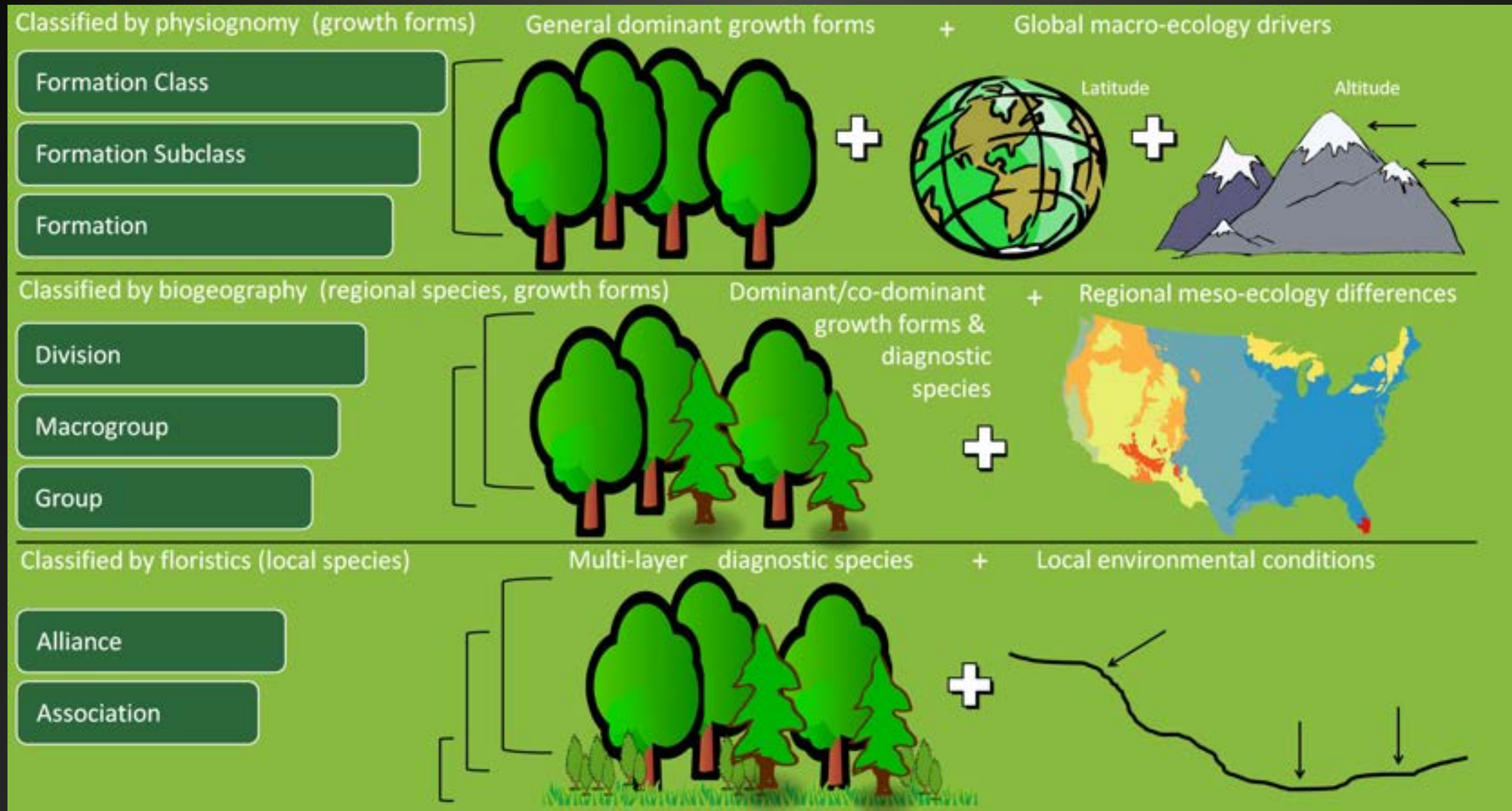
Hydrology

Elevation

Landform

USNVC Hierarchy (usnvc.org)

Vegetation classification in an ecological context

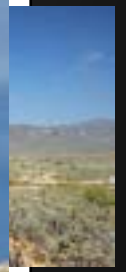


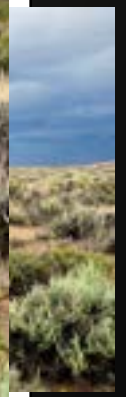
Barker Mountain, Okanogan County

Hierarc
Upper
Leve
Leve
Leve
Mid
Leve
Leve
Leve
Lower
Leve
Lev

Western North American Cool Semi-Desert Scrub & Grassland

Seedskadee National Wildlife Refuge, Wyoming
Photo by Tom Koemer, US Fish & Wildlife Service





Artemisia tripartita ssp. *tripartita* / *Festuca idahoensis* Shrub Steppe Association

Coarse vs Fine Filter Ecosystem Units

Coarse Filter Ecosystems

- Groups

Fine Filter Ecosystems

- Associations

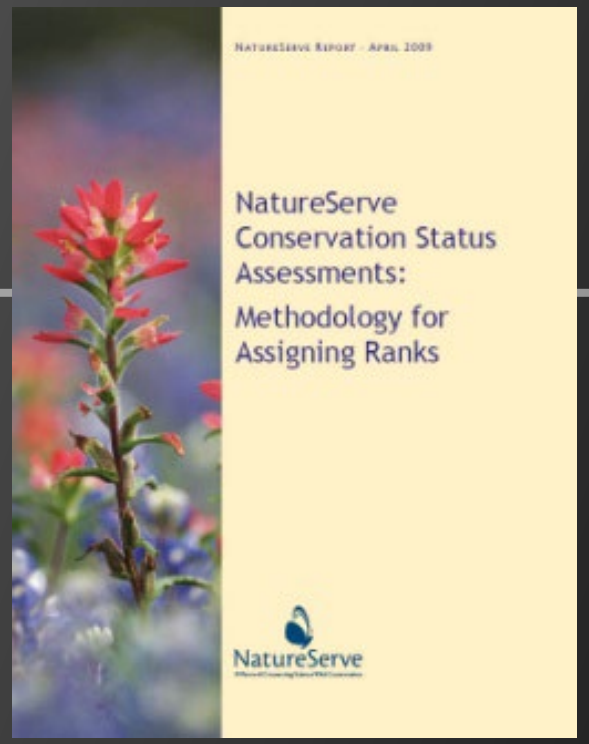
Hierarchy Levels	Example
Upper	
Level 1 – Class	Desert & Semi-Desert
Level 2 – Subclass	Cool Semi-Desert
Level 3 – Formation	Cool Desert & Semi-Desert Shrub Steppe
Mid	
Level 4 – Division	Western North American Cool Semi-Desert Scrub & Grassland
Level 5 – Macrogroup	Great Basin-Intermountain Tall Sagebrush Steppe & Shrubland
Level 6 – Group	**Intermountain Basins Big Sagebrush Steppe Group**
Lower	
Level 7 – Alliance	*Artemisia tripartita* ssp. *tripartita* Shrub Steppe Alliance
Level 8 – Association	***Artemisia tripartita* ssp. *tripartita* / *Festuca idahoensis* Shrub Steppe Association**

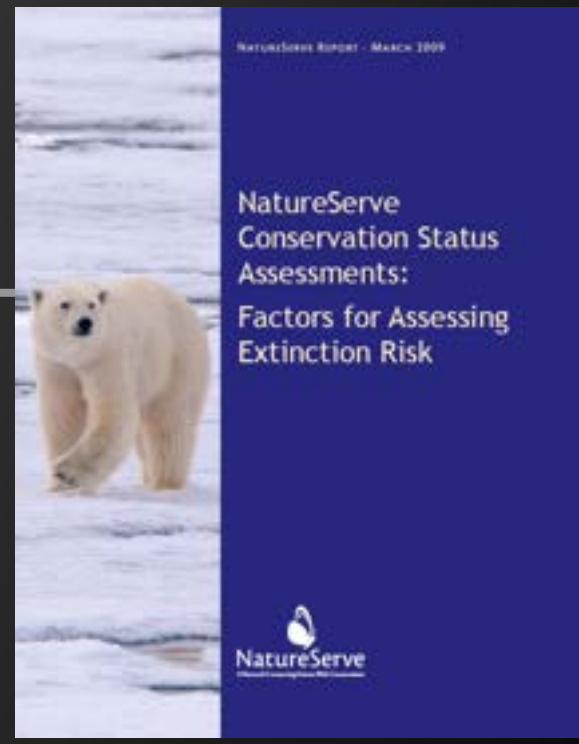
Prioritizing Ecosystem Conservation

Step 2: Assessing Imperilment

Conservation Status Ranking

- Number/area of occurrences
- Number/area of high-quality occurrences
- Range extent
- Area of occupancy
- Long-term trend
- Short-term trend
- Threats





G = Global, **S** = Subnational (e.g. state or province)

G1 or S1 = Critically Imperiled

G2 or S2 = Imperiled

G3 or S3 = Vulnerable

G4 or S4 = Apparently Secure

G5 or S5 = Demonstrably Secure

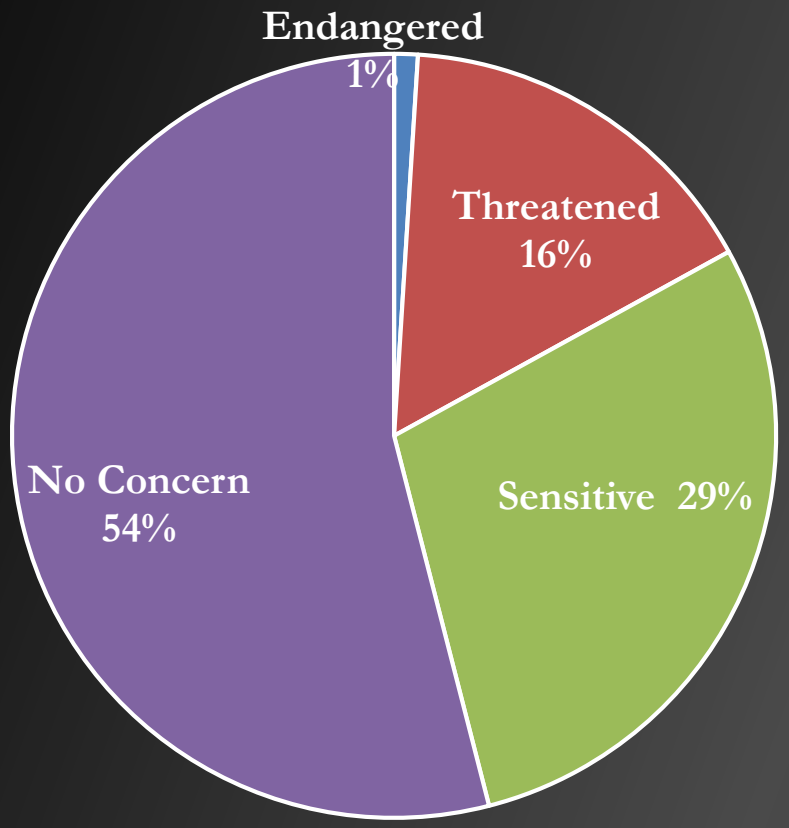
Step 3: Assign State Conservation Status

Natural Heritage Conservation Status Rank*	State Conservation Status**
G1S1, G2S1	Endangered
G2S2, G3S1, G3S2, GNRSNR**, GUSU**	Threatened
G3S3, G4S1, G4S2, G5S1, G5S2	Sensitive
G4S3, G4S4, G5S3, G5S4, G5S5	No Concern

*G = global conservation status rank; S = subnational conservation status rank

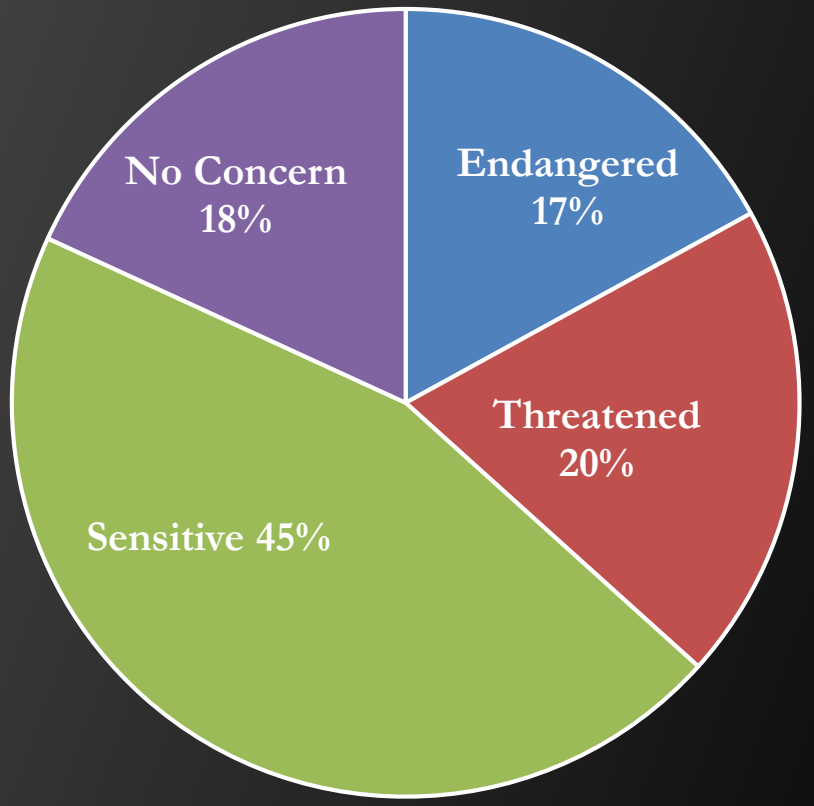
**G2/SNR treated like G2/S2 = Threatened, Higher ranked (i.e. G3/SNR and up) are treated like G3/S3 associations = Sensitive; If a rank spans two ranks (S1S2), the most conservative rank (S1) was used; If range spans three ranks (S1S3), the midpoint (S2) was used. GNR/SNR and GU/SU were treated as threatened.

USNVC Groups State Conservation Status



Total Groups = 75

USNVC Associations State Conservation Status



Total Associations = 1,048

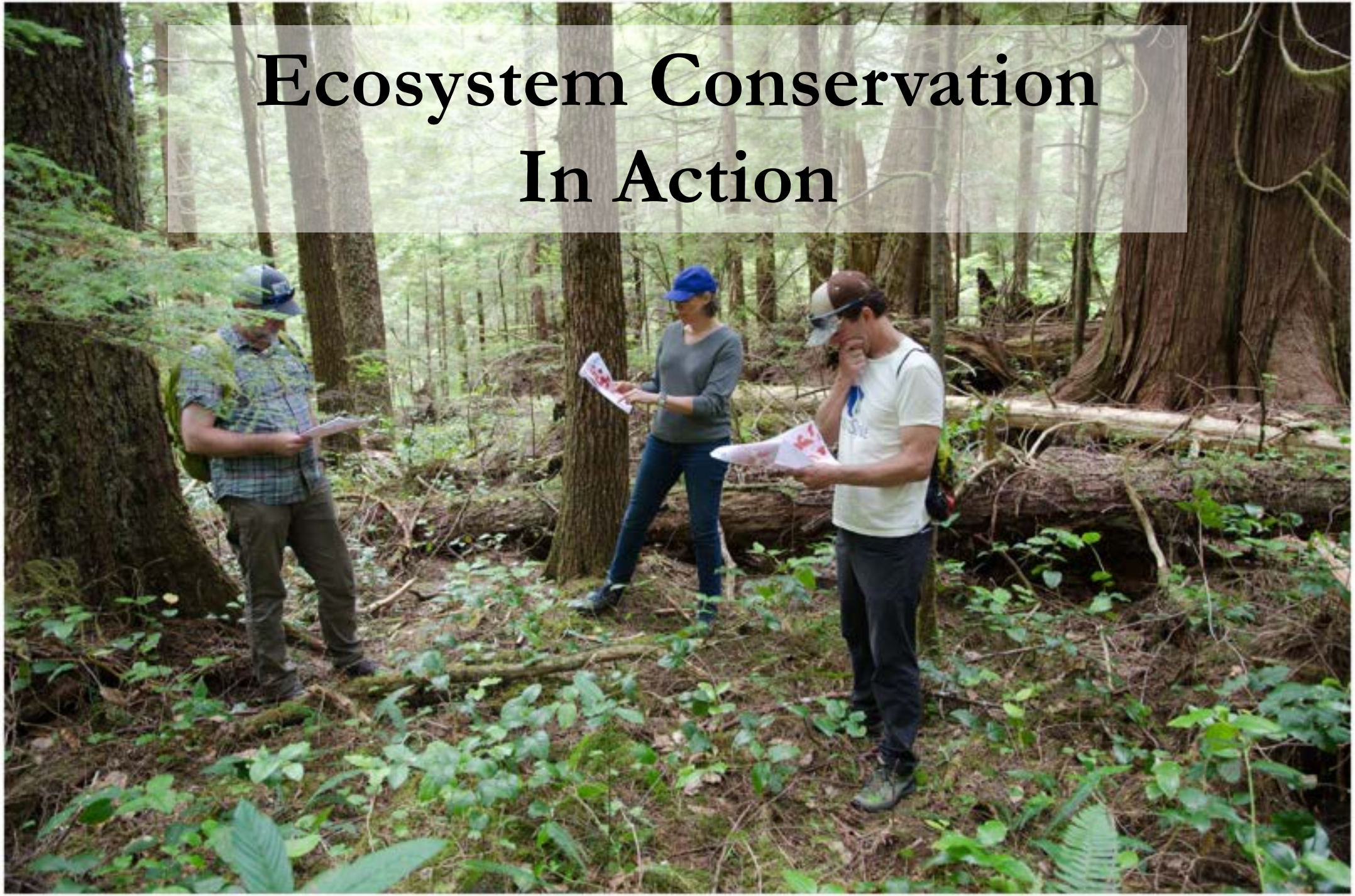
Step 4: Assign Natural Area Representation Priorities

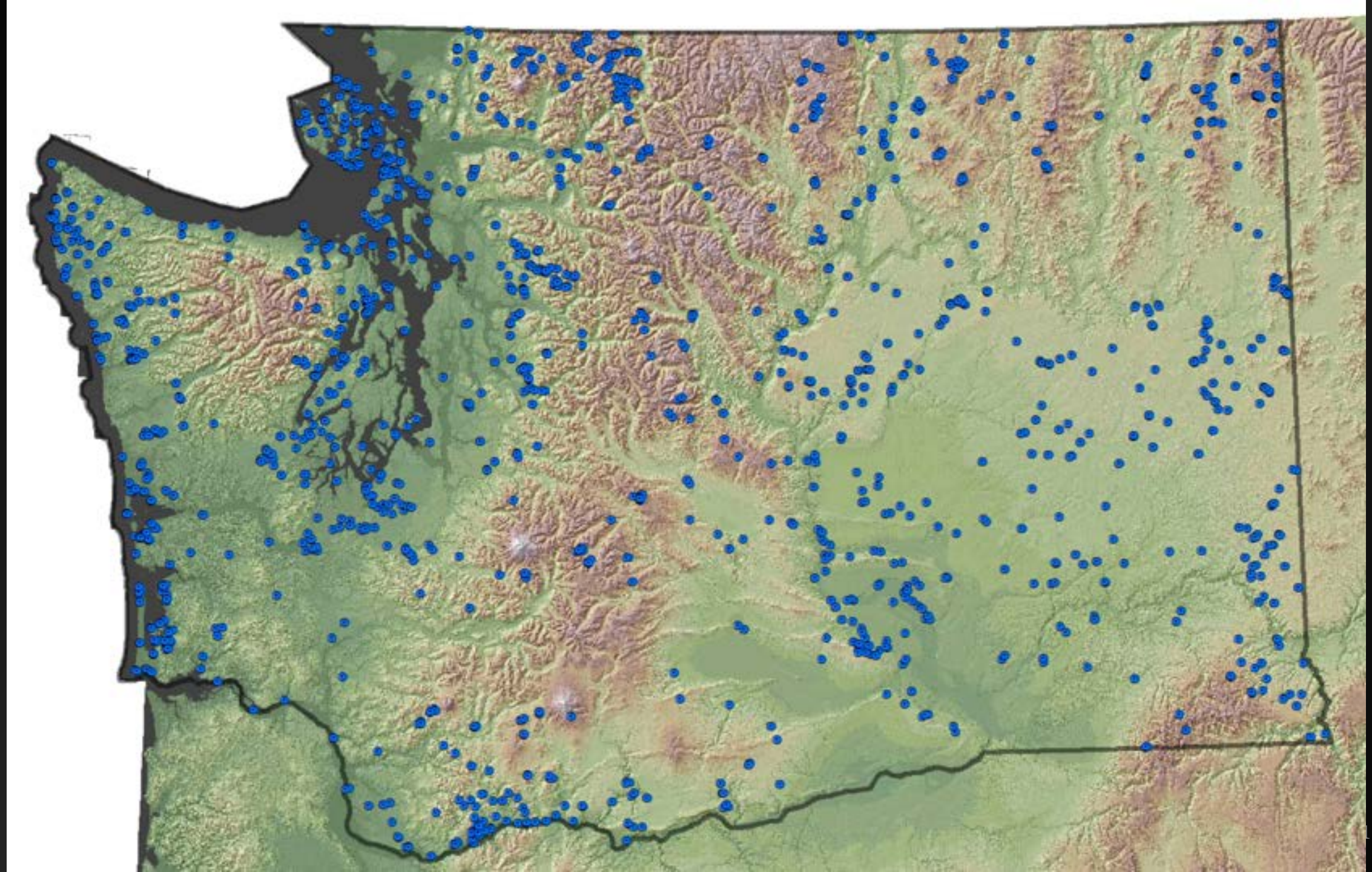
	Number of Natural Areas the Element is Represented Within				
State Conservation Status	0	1	2	3-5	>5*
Endangered	Priority 1	Priority 1	Priority 1	Priority 2	Priority 3*
Threatened	Priority 1	Priority 1	Priority 2	Priority 3	Adequately Represented*
Sensitive**	Priority 1	Priority 2	Priority 2	Priority 3	Adequately Represented*
No Concern**	Priority 2	Priority 3	Priority 3	Adequately Represented*	Adequately Represented*

*If represented in all of the ecoregions in which element is found

** Does not apply to fine filter ecosystems

Ecosystem Conservation In Action





WDFW

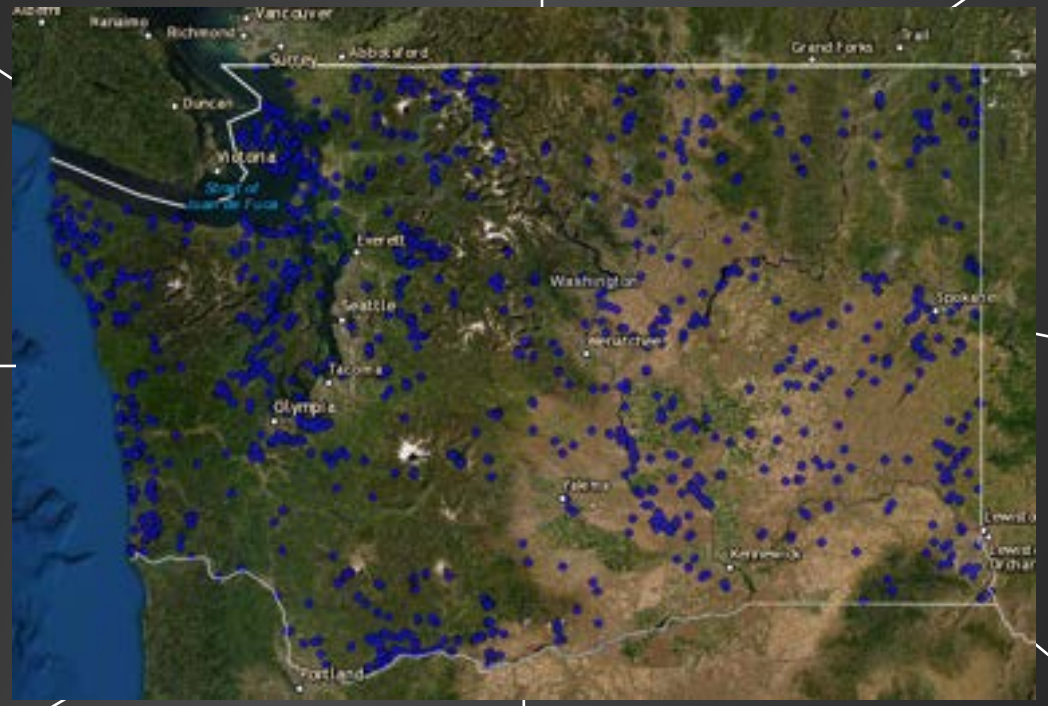
Ecological Systems of Concern (State Wildlife Action Plan)

Local municipalities

Critical Areas designations

SEPA

Rare & exemplary ecosystems



National Park Service

Vegetation inventory & mapping

Washington Wildlife & Recreation Program Funding

Biodiversity protection priorities

WA Dept. of Ecology

Wetland Rating System

Statewide System of Natural Areas

DNR

Sustainable Forestry Initiative certification

Natural Areas Network

- Represent examples of Washington's diversity of ecosystems and species
- Includes federal, state and private natural areas

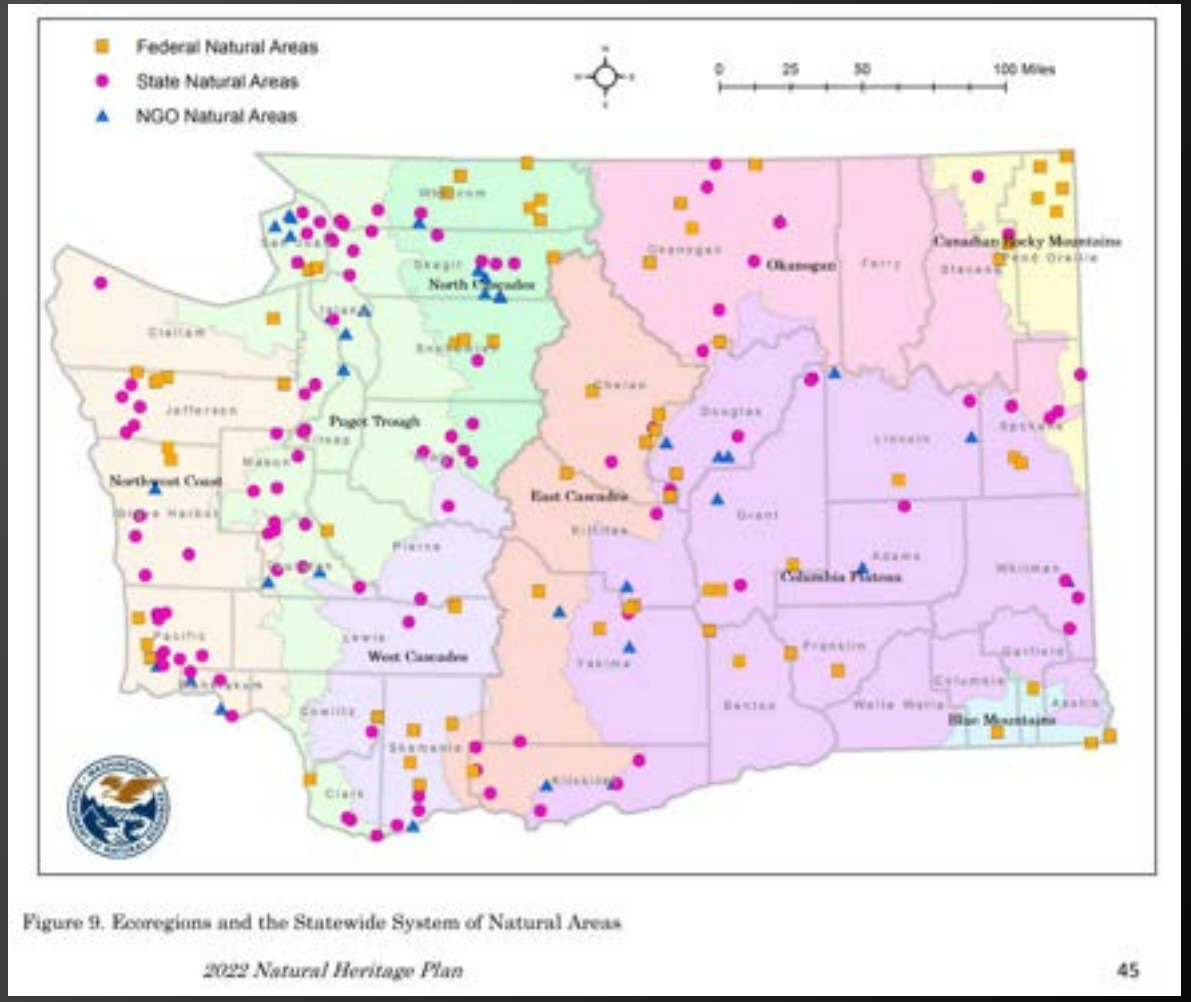
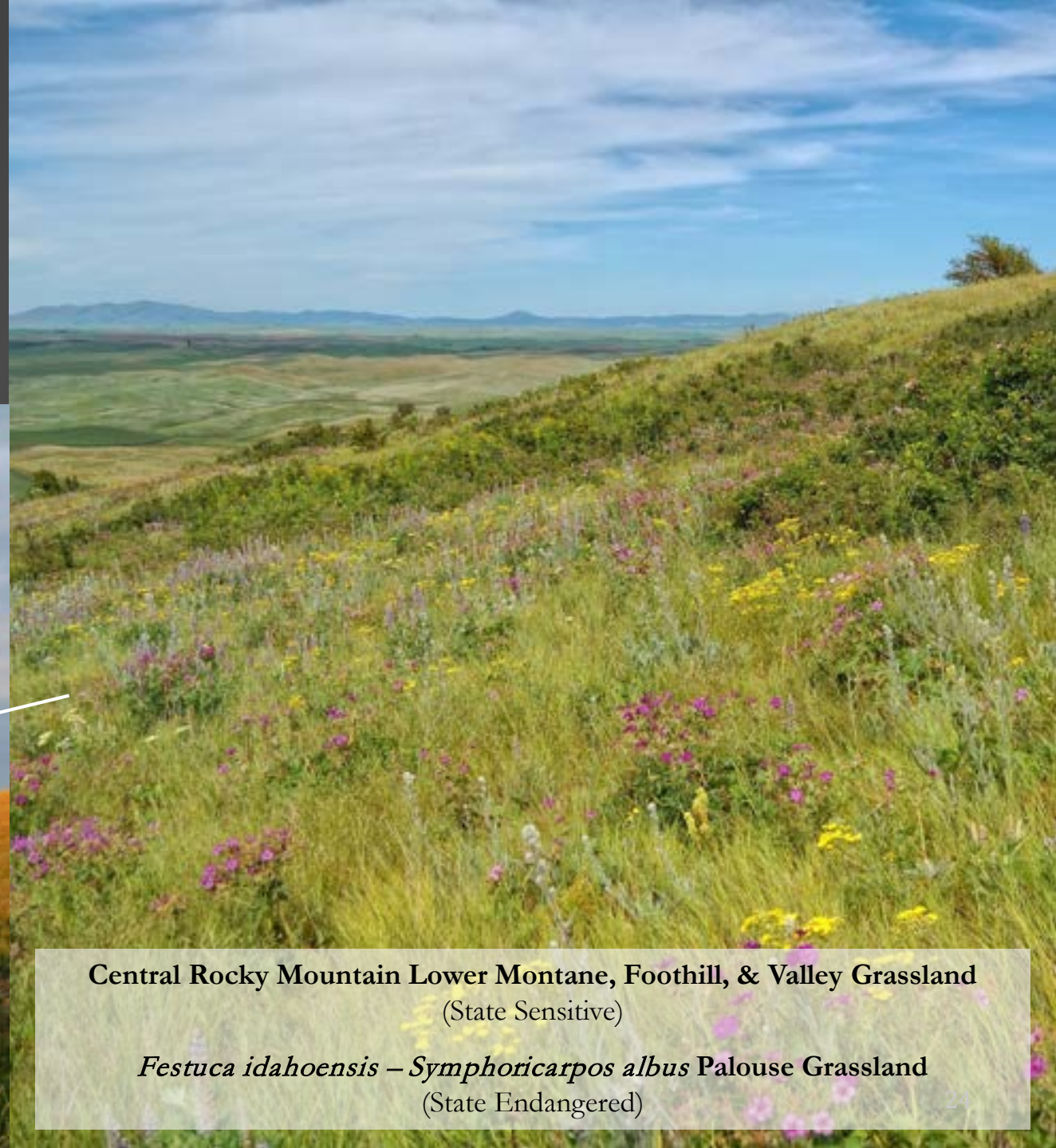


Figure 9. Ecoregions and the Statewide System of Natural Areas

Steptoe Butte Natural Area Preserve



Central Rocky Mountain Lower Montane, Foothill, & Valley Grassland
(State Sensitive)

***Festuca idahoensis* – *Symphoricarpos albus* Palouse Grassland**
(State Endangered)

Stepto l Area

Silene scouleri ssp. *scouleri*
G5T3T5S1 - State Sensitive

Silene spaldingii
G2S2 - State & Federal Threatened

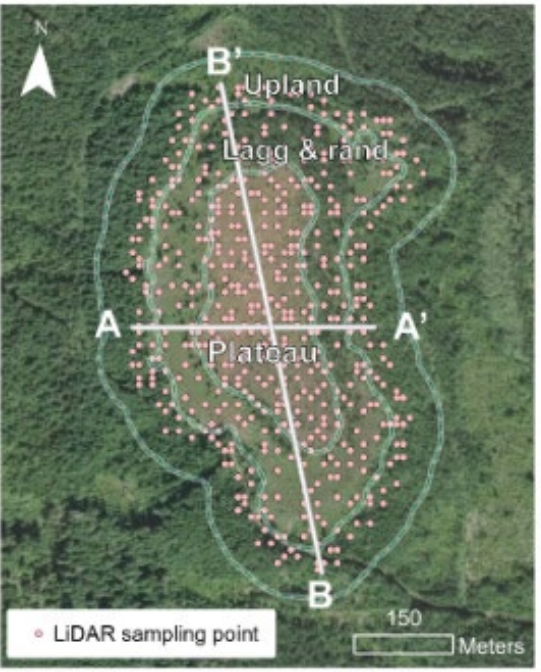
Pyrrocoma liatriformis
G2S2 - State Threatened

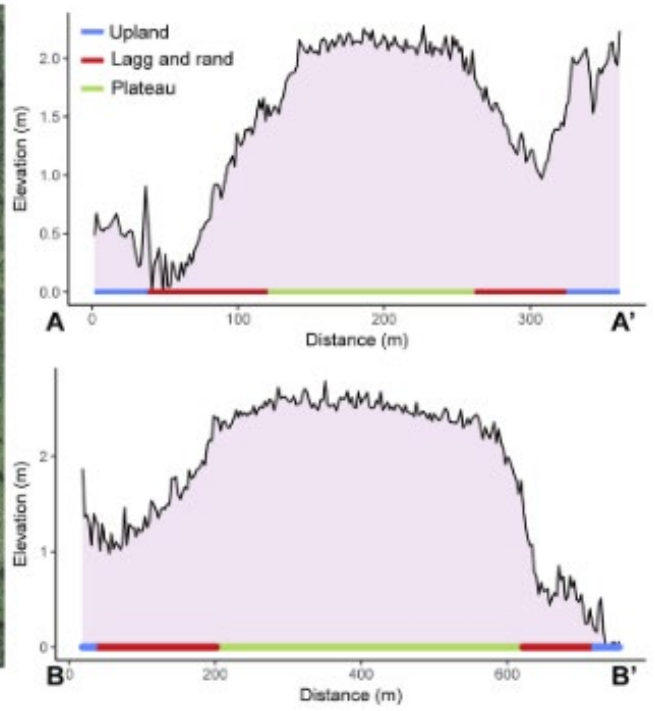
Calochortus nitidus
G3S1 - State Endangered

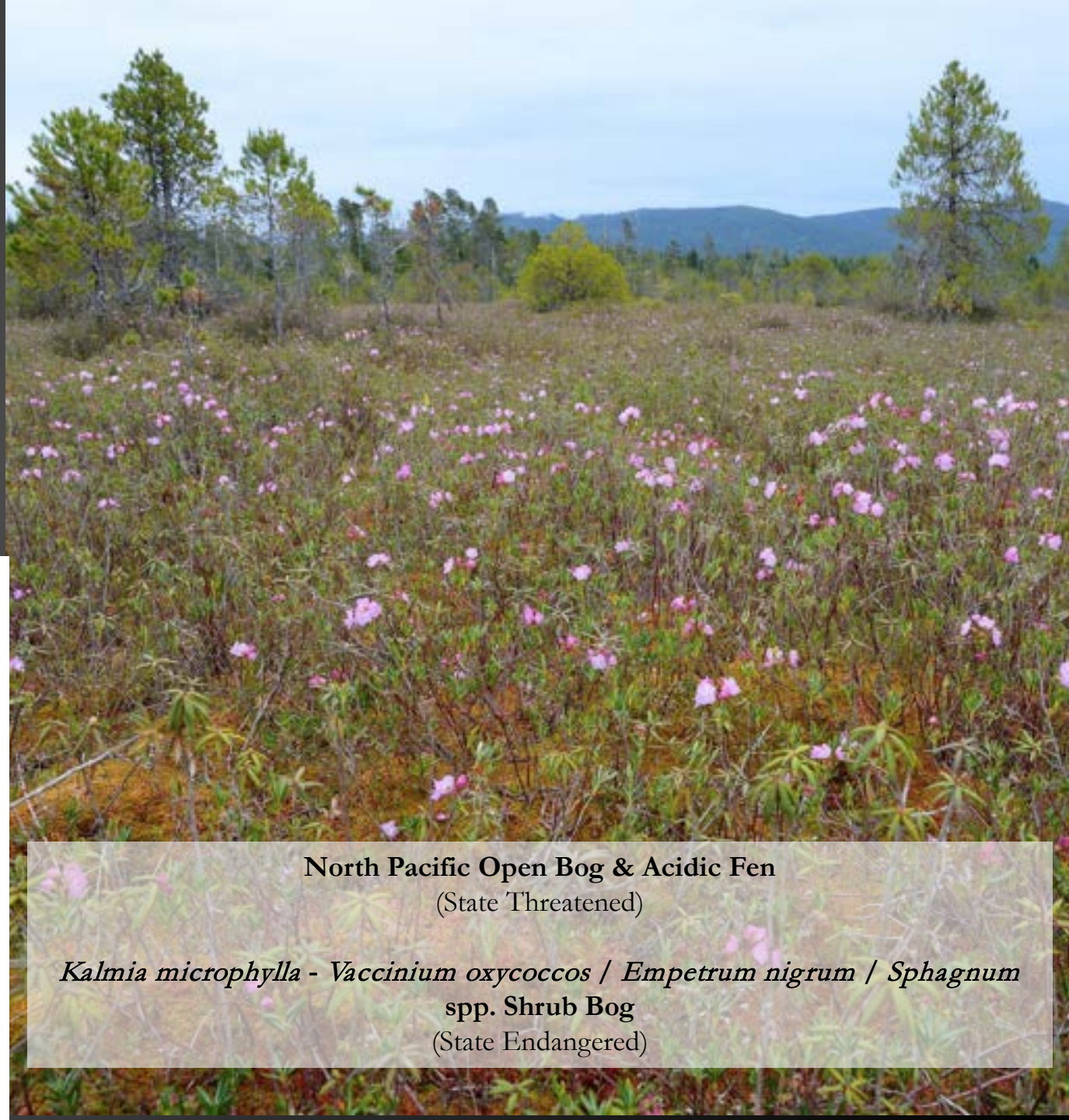
Central Rocky Mountain Lowe
(St

Festuca idahoensis – Symp
(Stat

Crowberry Bog Natural Area Preserve







North Pacific Open Bog & Acidic Fen
(State Threatened)

***Kalmia microphylla* - *Vaccinium oxycoccos* / *Empetrum nigrum* / *Sphagnum* spp. Shrub Bog**
(State Endangered)

Current Representation in the Statewide System of Natural Areas

Group State Conservation Status	# Groups Represented	Total in State	% Represented
Endangered	1	1	**100%**
Threatened	11	12	**92%**
Sensitive	19	22	**86%**
No Concern	32	40	**80%**
Totals	**63**	**75**	84%

Association State Conservation Status	# Associations Represented	Total in State	% Represented
Endangered	49	180	**27%**
Threatened	63	208	**30%**
Totals	**112**	**388**	28%

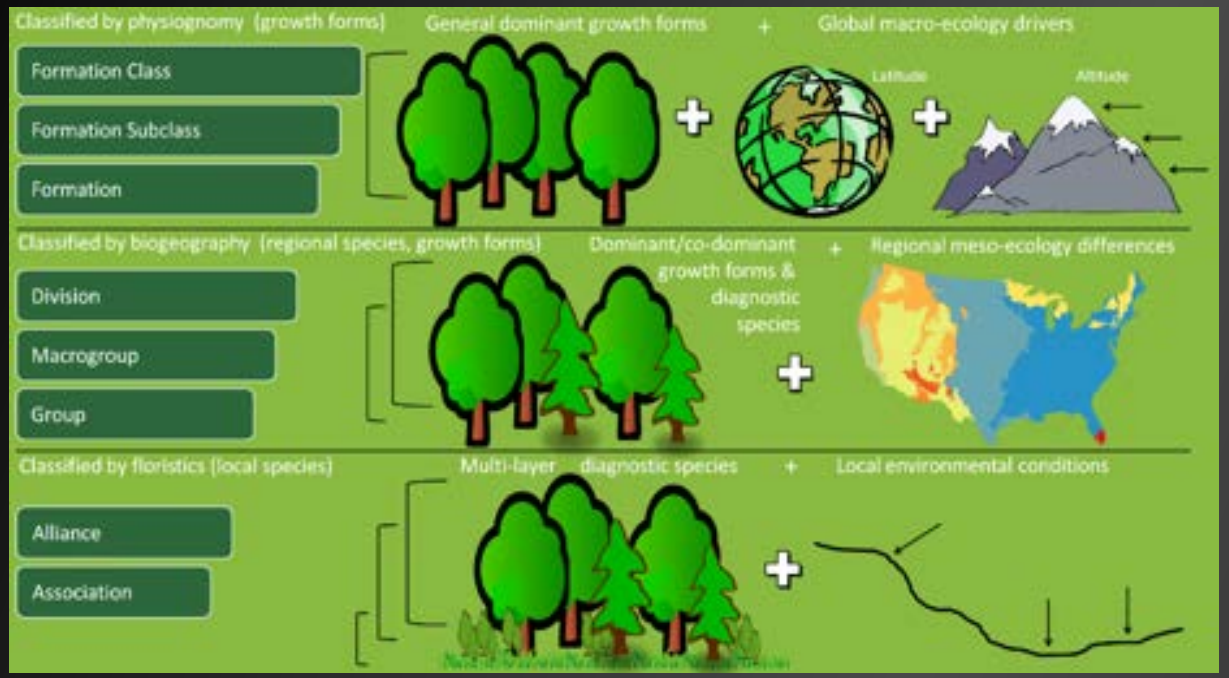
Effectiveness of Coarse Filter

	DNR Natural Areas	WA State	Proportion in DNR Natural Areas
Native Taxa	1,506	2,634	57%
Native Genera	501	649	77%
Native Families	118	129	91%
Land Area (Ac.)	69,918	42,612,480	0.16%

Global Linkages & Applications

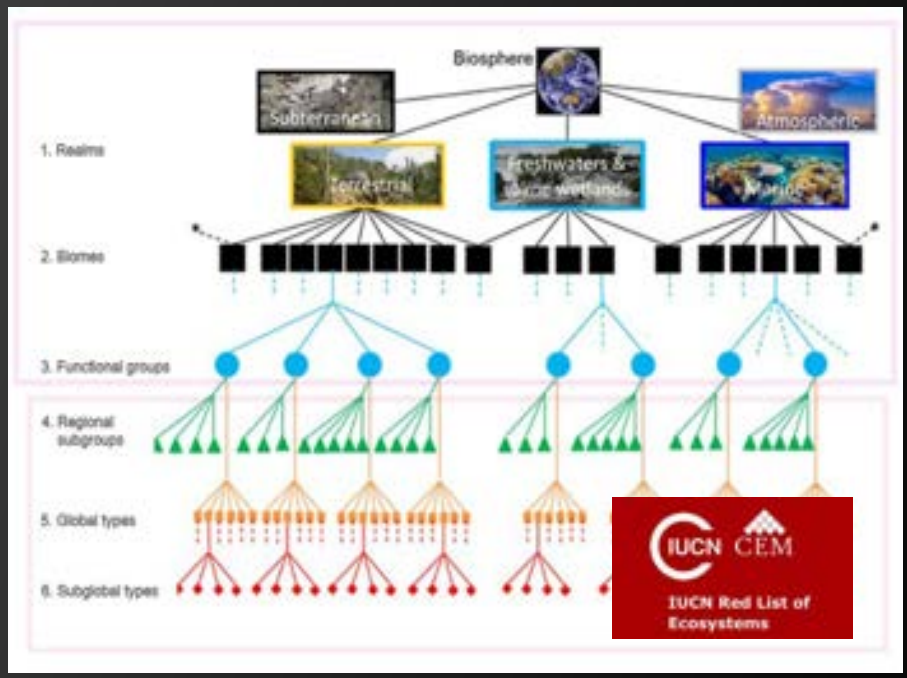
https://global-ecosystems.org/explore/groups/T5.1

Linked to IUCN Global Ecosystem Typology (GET)



Global:
- Form
- Function
- Processes

Local
- Species
- Function
- Processes



https://explorer.natureserve.org

Faber-Langendoen et al. 2014

https://global-ecosystems.org

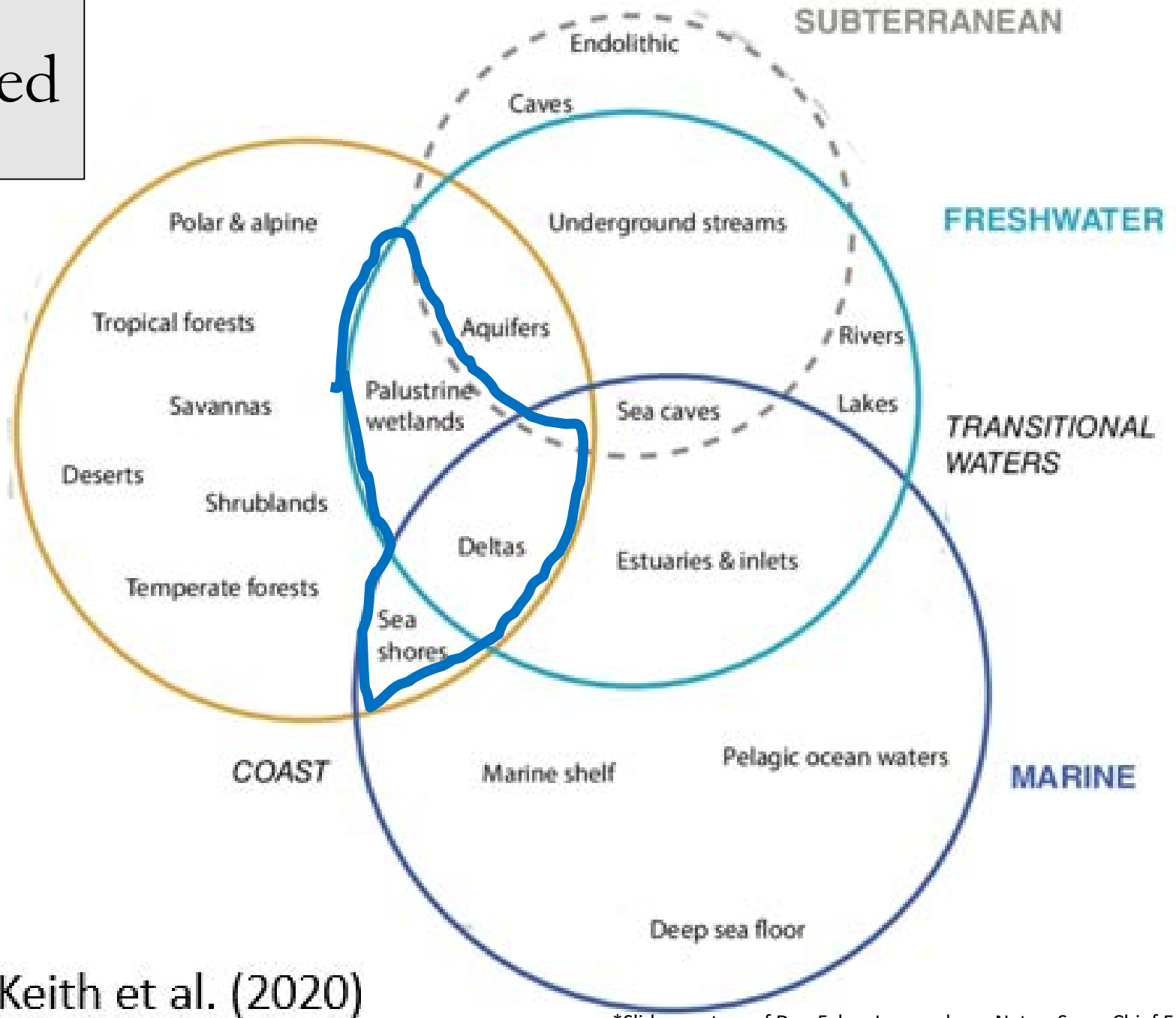
Keith et al. 2022

*Slide courtesy of Don Faber-Langendoen, NatureServe Chief Ecologist

Both Systems Improved

Realms:
Terrestrial (T)

Transitional Realms:
TF: Terrestrial-Freshwater
MT:Marine-Terrestrial
MFT: Marine-Fresh-Terrestrial

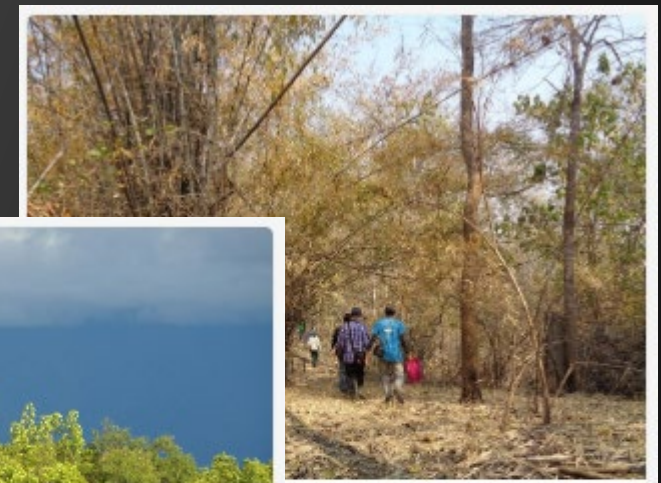


Source: Modified from Keith et al. (2020)

*Slide courtesy of Don Faber-Langendoen, NatureServe Chief Ecologist

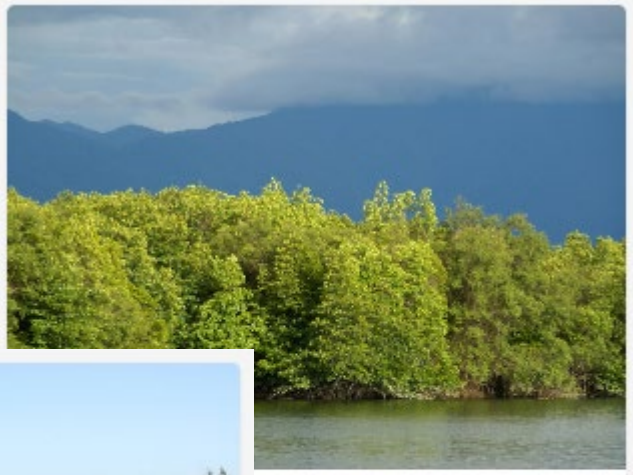
International Collaboration

- Common language for assessments, e.g.
  - IUCN Red List of Ecosystems
  - Key Biodiversity Areas



amboo thicket

NT



/Terrestrial

Andaman, South East Asia

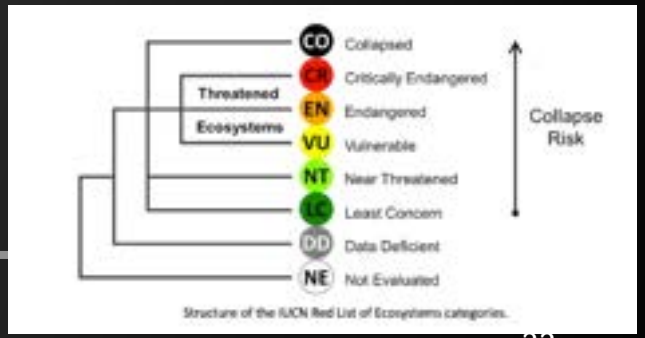
LC

Terrestrial

Great Lakes Alvar, North America

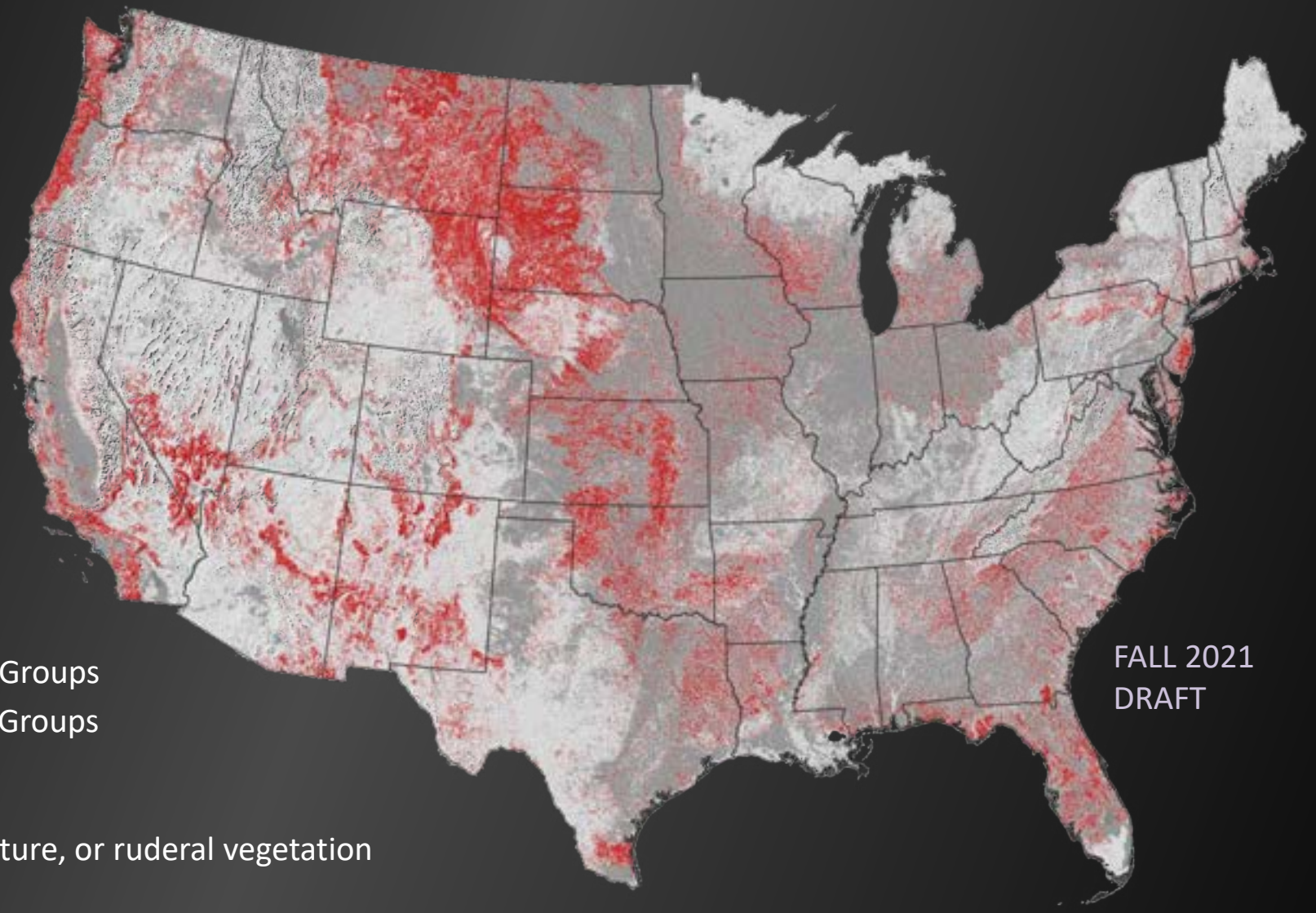
SUB-GLOBAL

EN



Structure of the IUCN Red List of Ecosystems categories.

Location of At-risk Ecosystems: USNVC Groups



*Slide courtesy of Don Faber-Langendoen, NatureServe Chief Ecologist

Peer-Review

- Moderated by Ecological Society of America Vegetation Panel
- WNHP participates as editors
- Please reach out!

Questions?

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References

Washington Department of Natural Resources (WADNR). 2022. State of Washington Natural Heritage Plan. Olympia, WA. Online: https://www.dnr.wa.gov/publications/amp_nh_plan_2022.pdf

Dethier M.N. 1990. A marine and estuarine habitat classification system for Washington State. Washington Natural Heritage Program, Department of Natural Resources, Olympia, WA. NHR-1990-01. Online: http://dnr.wa.gov/publications/amp_nh_marine_class.pdf

Faber-Langendoen D., T. Keeler-Wolf, D. Meidinger, D. Tart, B. Hoagland, C. Josse, G. Navarro, S. Ponomarenko, J.P. Saucier, A. Weakley, and P.J. Comer. 2014. EcoVeg: a new approach to vegetation description and classification. Ecological Monographs 84(4):533–561.

Keith D.A., J.R. Ferrer-Paris, E. Nicholson, M.J. Bishop, B.A. Polidoro, E. Ramirez-Llodra, M.G. Tozer, J.L. Nel, R. Mac Nally, E.J. Gregr, K.E. Watermeyer, F. Essl, D. Faber-Langendoen, J. Franklin, C.E.R. Lehmann, A. Etter, D.J. Roux, J.S. Stark, J.A. Rowland, N.A. Brummitt, U.C. Fernandez-Arcaya, I.M. Suthers, S.K. Wiser, I. Donohue, L.J. Jackson, R.T. Pennington, T.M. Iliffe, V. Gerovasileiou, P. Giller, B.J. Robson, N. Pettorelli, A. Andrade, A. Lindgaard, T. Tahvanainen, A. Terauds, M.A. Chadwick, N.J. Murray, J. Moat, P. Pliscoff, I. Zager, and R.T. Kingsford. 2022. A function-based typology for Earth's ecosystems. Nature 610(7932):513–518.