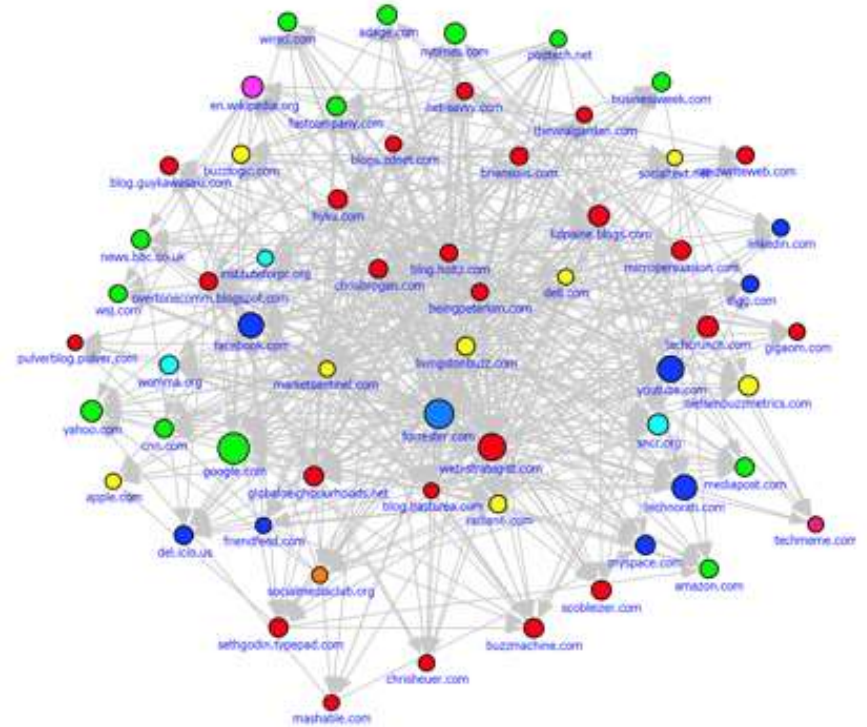
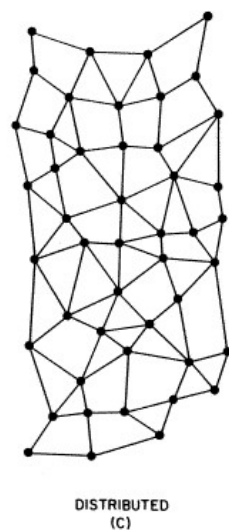
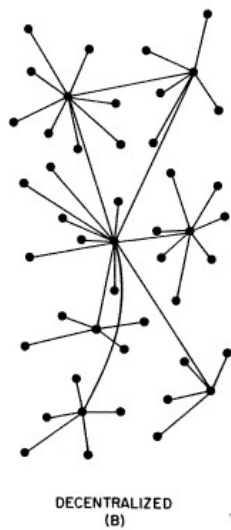
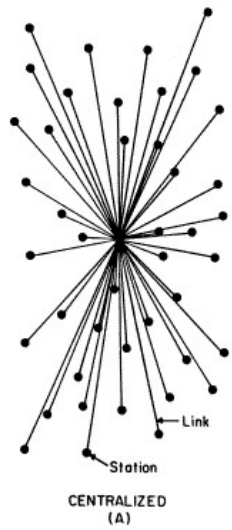


WASHINGTON NATURAL HERITAGE PROGRAM PARTNER'S MEETING

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4:30 –	Mixer - off-site

TOPOLOGY OF SOCIAL NETWORKS

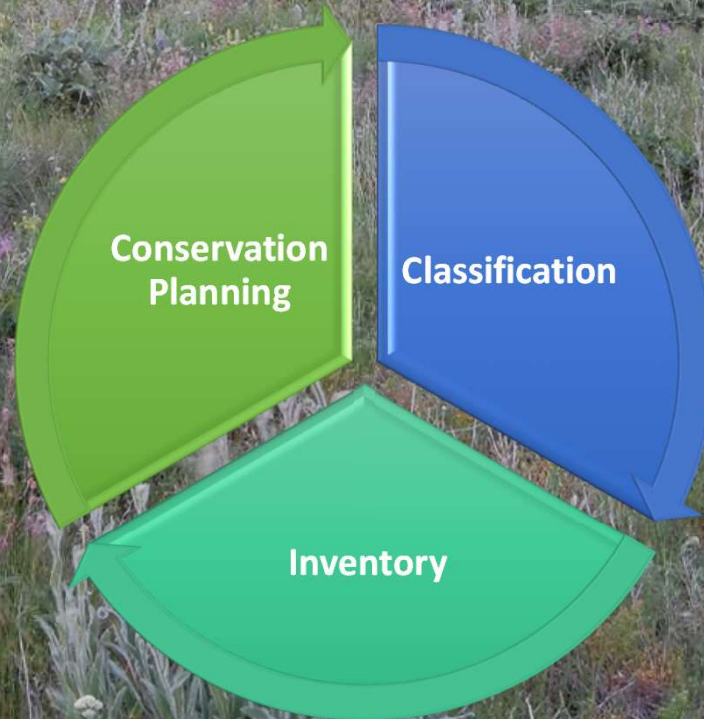


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NATURAL HERITAGE PROGRAM

Connecting conservation science with
conservation action



NATURAL HERITAGE PROGRAM

Catalogue (classify)

- fine filter – rare species / rare ecosystems
- coarse filter – high-quality examples of ecosystem types



Island marble butterfly
G1S1 (state endangered)



Whited's milkvetch
G1S1 (state endangered)



Idaho Fescue – Common
Snowberry Grassland
G1S1 (state endangered)

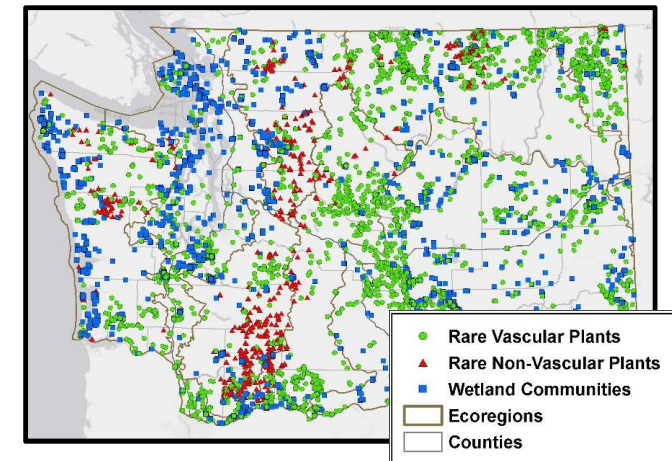
NATURAL HERITAGE PROGRAM

Catalogue (classify)

- fine filter – rare species / rare ecosystems
- coarse filter – high-quality examples of ecosystem types

Inventory

- are they common? rare?
- where are they? ecological condition?



NATURAL HERITAGE PROGRAM

Catalogue (classify)

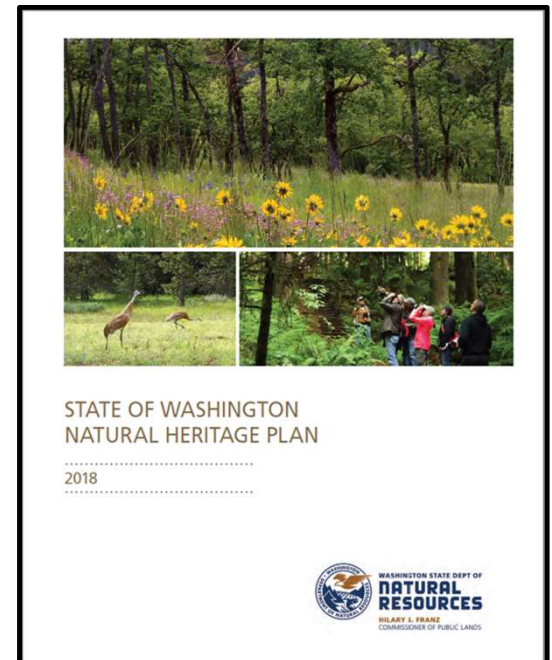
- fine filter – rare species / rare ecosystems
- coarse filter – high-quality examples of ecosystem types

Inventory

- are they common? rare?
- where are they? ecological condition?

Conservation planning

- what sites are in need of conservation action?
- what are the management needs of the biological feature(s) and of the site(s)?



NATURAL HERITAGE PROGRAM - ECOLOGY



Classification

- Ecological Systems
- U.S. National Vegetation Classification

Inventory

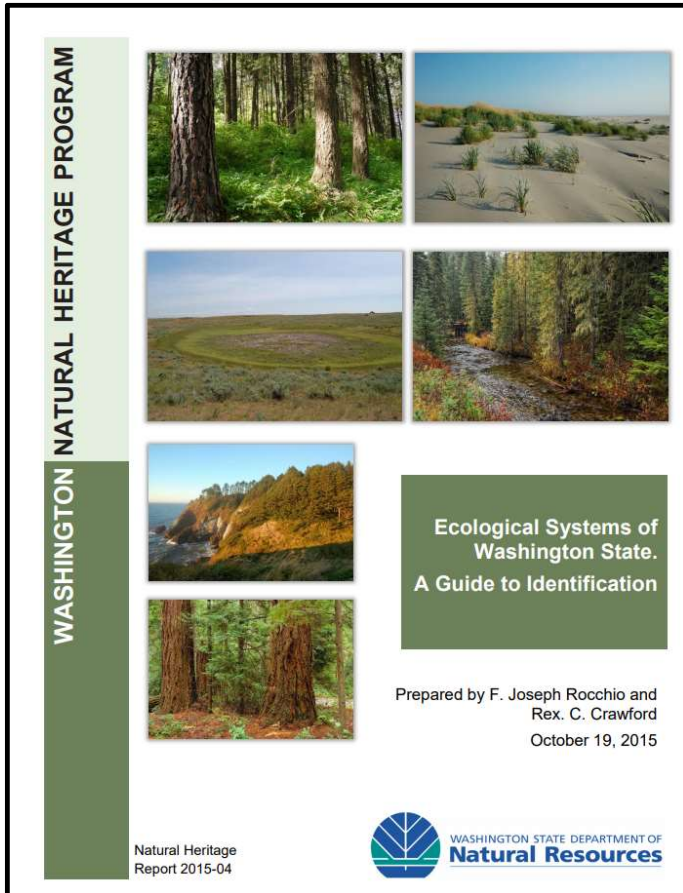
- Ecosystem Assessments

Conservation Planning

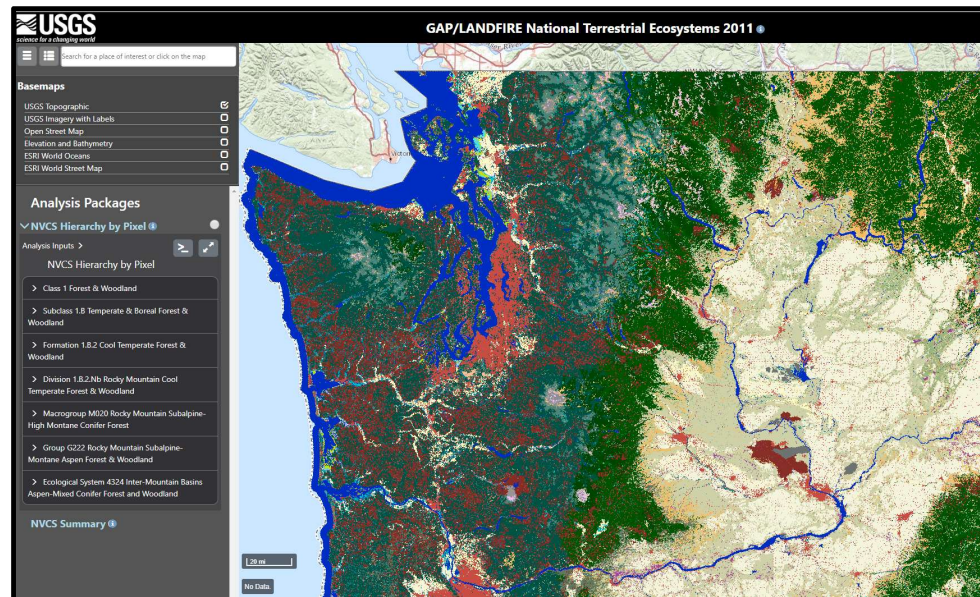
- Ecosystem conservation priorities
- Natural Area recommendations
- Research



Classification: Ecological Systems



- coarse-scale units for mapping, biodiversity assessment, and management
- statewide map available



https://www.dnr.wa.gov/publications/amp_nh_ecosystems_guide.pdf?v0mnp

Classification: U.S. National Vegetation Classification (USNVC)

WNHP is the official state partner of the USNVC

- provide peer-review on USNVC changes
- prioritize USNVC units for conservation action



The screenshot shows the homepage of the United States National Vegetation Classification (USNVC). The header includes the USNVC logo and a navigation menu with links for Overview, Get Involved!, Explore The Classification, Revisions, Data Standard, Resources, and About. The main title is "The U.S. National Vegetation Classification" with the subtitle "YOUR GUIDE TO INVENTORING NATURAL AND CULTURAL PLANT COMMUNITIES". Below the title are three images: a wetland with lily pads, a wetland with a winding stream, and a grassy field. The main content area is divided into two columns. The left column is titled "Your Guide to Inventorying Natural and Cultural Vegetation Communities" and contains a paragraph about the NVC's purpose and a list of seven applications. The right column is titled "Highlights" and features a link for the "Launch of NVC for the U.S." and a section for the "Hierarchy Explorer" tool. The URL <http://usnvc.org/> is displayed at the bottom right.

United States National Vegetation Classification

Overview | Get Involved! | Explore The Classification | Revisions | Data Standard | Resources | About

The U.S. National Vegetation Classification

YOUR GUIDE TO INVENTORING NATURAL AND CULTURAL PLANT COMMUNITIES



Your Guide to Inventorying Natural and Cultural Vegetation Communities

The National Vegetation Classification provides a common language for the effective management and conservation of plant communities and can help support a wide variety management applications. For example:

- Modeling and mapping wildlife habitat
- Enhancing natural resource conservation efforts – choosing the best for reserves and wildlife areas
- Fire management planning and modeling
- Studying patterns of vegetation change over time due to climate change and other causes
- Managing invasive species
- Land inventory and mapping programs (public and private)
- Setting national vegetation policies (e.g., biofuels, carbon markets, ecosystem services)

Highlights

Launch of NVC for the U.S. >

Try out the new Hierarchy Explorer
View vegetation classifications for U.S. plant communities

<http://usnvc.org/>

Classification: U.S. National Vegetation Classification (USNVC)

Recent USNVC Projects

- National Park Service Classification Revisions
- Field Guide to Wetland & Riparian Plant Associations (USEPA grant)

Proposed changes to upland divisions of the US National Vegetation Classification (USNVC) resulting from classification and mapping at Olympic, North Cascades, and Mount Rainier National Parks

Tynan Ramm-Granberg
Washington Natural Heritage Program



Field Guide to Wetland and Riparian Plant Associations of Washington State (Draft)

F. Joseph Rocchio, R.C. Crawford, and T. Ramm-Granberg
Washington Department of Natural Resources, Natural Heritage Program
Olympia, Washington

August 21, 2019


Inventory: Ecosystem Assessment

Ecological Indicators 104 (2019) 764–775

Contents lists available at ScienceDirect

Ecological Indicators

journal homepage: www.elsevier.com/locate/ecolind




Original Articles


Development and evaluation of NatureServe’s multi-metric ecological integrity assessment method for wetland ecosystems

Don Faber-Langendoen^{a,c}, Joanna Lemly^b, William Nichols^c, Joe Rocchio^d, Kathleen Walz^c, Regan Smyth^a

^a NatureServe, Conservation Science Division, 2511 Richmond Highway, Suite 930, Arlington, VA 22202, United States
^b Colorado Natural Heritage Program, Colorado State University, 252 General Services Building, 1475 Campus Delivery, Fort Collins, CO 80523-1475, United States
^c NH Natural Heritage Bureau, Division of Forests & Lands – DPCR, 172 Pembroke Road, Concord, NH 03301, United States
^d Washington Dept. of Natural Resources, Natural Heritage Program, Olympia, WA 98504, United States
^e Natural Heritage Program, NJDEP MC 501-04, Office of Natural Lands Management, 501E State Street, 4th Floor, Trenton, NJ 08625, United States




Field Manual for Applying Rapid Ecological Integrity Assessments in Wetlands and Riparian Areas in Washington State



March, 2017

Prepared by:
 F. Joseph Rocchio and Tynan Ramm-Granberg
 Washington Natural Heritage Program
 Washington Department of Natural Resources
 Olympia, Washington 98504-7014

Field Manual for Applying Rapid Ecological Integrity Assessments in Upland Plant Communities of Washington State (DRAFT)



November 27, 2018

Prepared by:
 F. Joseph Rocchio,
 Tynan Ramm-Granberg,
 and Rex C. Crawford
 Washington Natural Heritage Program
 Washington Department of Natural Resources
 Olympia, Washington 98504-7014

ECOLOGICAL INTEGRITY

Rank Factor: LANDSCAPE CONTEXT

MEF: LANDSCAPE

- LAN1. Contiguous Natural Land Cover
- LAN2. Land Use Index

MEF: BUFFER

- BUF1. Perimeter with Natural Buffer
- BUF2. Width of Natural Buffer
- BUF3. Condition of Natural Buffer

Rank Factor: CONDITION

MEF: VEGETATION

- VEG1. Native Plant Species Cover
- VEG2. Invasive Nonnative Plant Species Cover
- VEG3. Native Plant Species Composition
- VEG4. Overall Vegetation Structure
- VEG5. Woody Regeneration
- VEG6. Coarse Woody Debris

MEF: HYDROLOGY

- HYD1. Water Source
- HYD2. Hydroperiod
- HYD3. Hydrologic Connectivity

MEF: SOIL

- SOI1. Soil Condition

Inventory: Ecosystem Assessment

Recent Ecosystem Assessment Projects

- Columbia Land Trust - EIA
 - 20 sites, 285 polygons, ~6400 acres
 - Refined EIA protocols
 - Identified areas of conservation significance
- State Parks EIA
 - 21 parks targeted
 - various ecosystem types
- Floristic Quality Assessment
 - Test across human stressor gradient
- Invasive Species Ranking

WASHINGTON NATURAL HERITAGE PROGRAM



Adapting Ecological Integrity Assessment Protocols for Monitoring Columbia Land Trust Conservation Properties

Prepared for
Columbia Land Trust

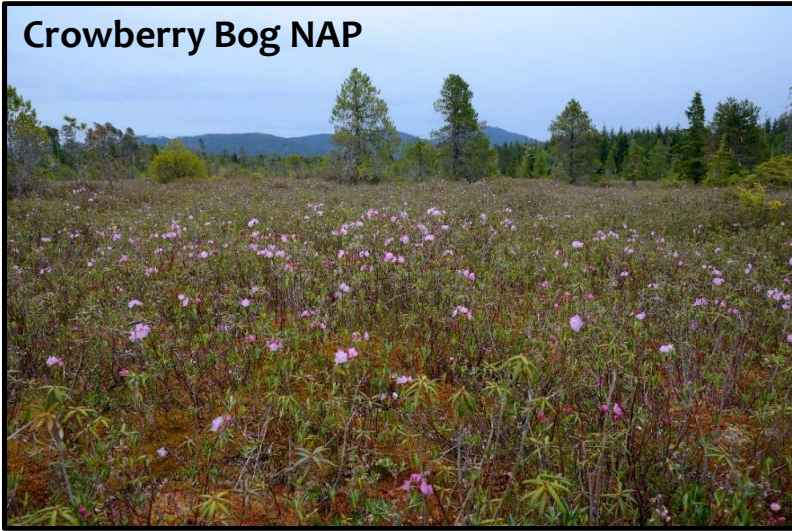
Prepared by
F. Joseph Rocchio and Tynan Ramm-Granberg
June 30, 2019

Natural Heritage
Report 2019-03



Conservation Planning: Natural Area Recommendations

Crowberry Bog NAP



Steptoe Butte (proposed)



Marsh Creek (proposed)



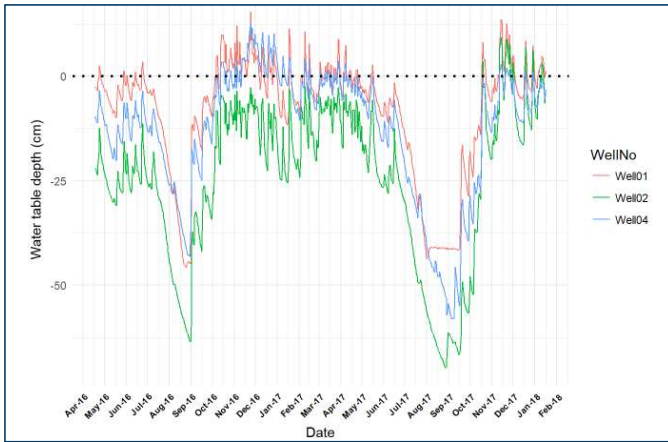
Onion Ridge (proposed)



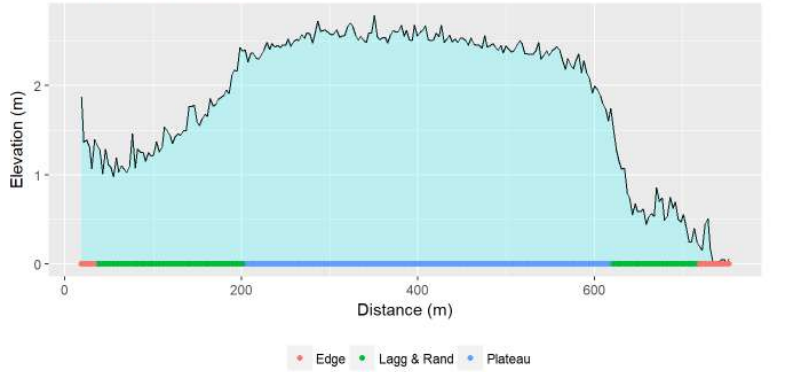
Conservation Planning: Research

Crowberry Bog

- ecological characteristics
- identify type of bog

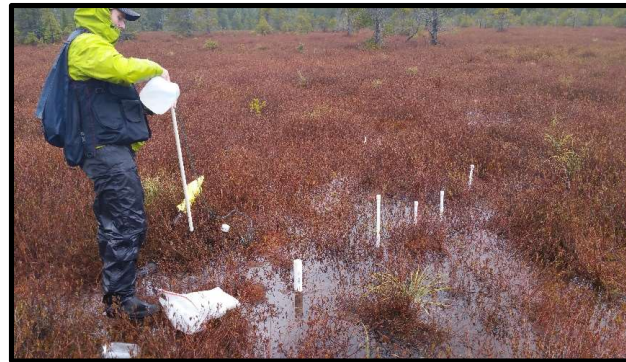


Adjusted terrain elevation
Lidar DTM elevation - minimum DTM elevation

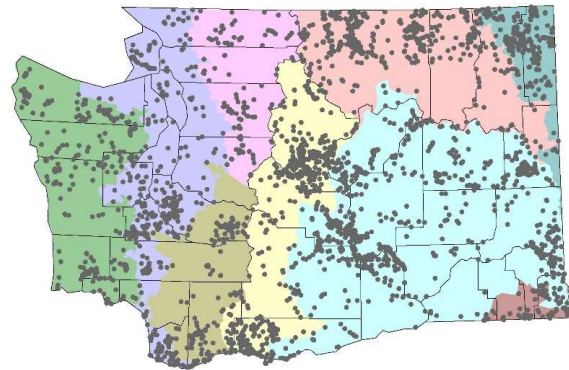
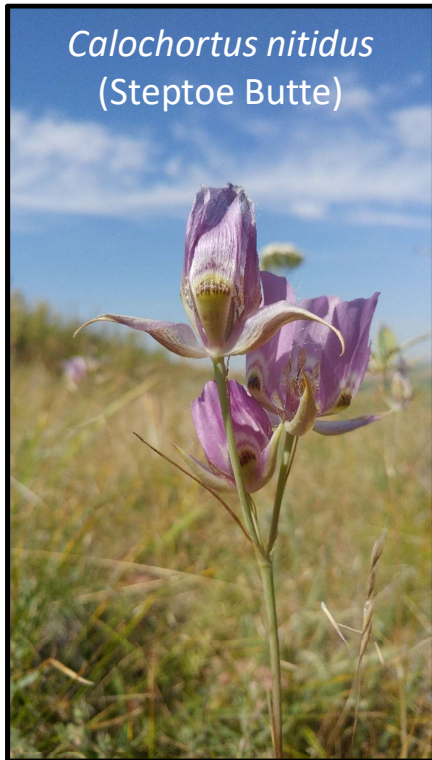


Puget lowland bog research

- does surrounding land use impact ecological integrity of bogs?



NATURAL HERITAGE PROGRAM

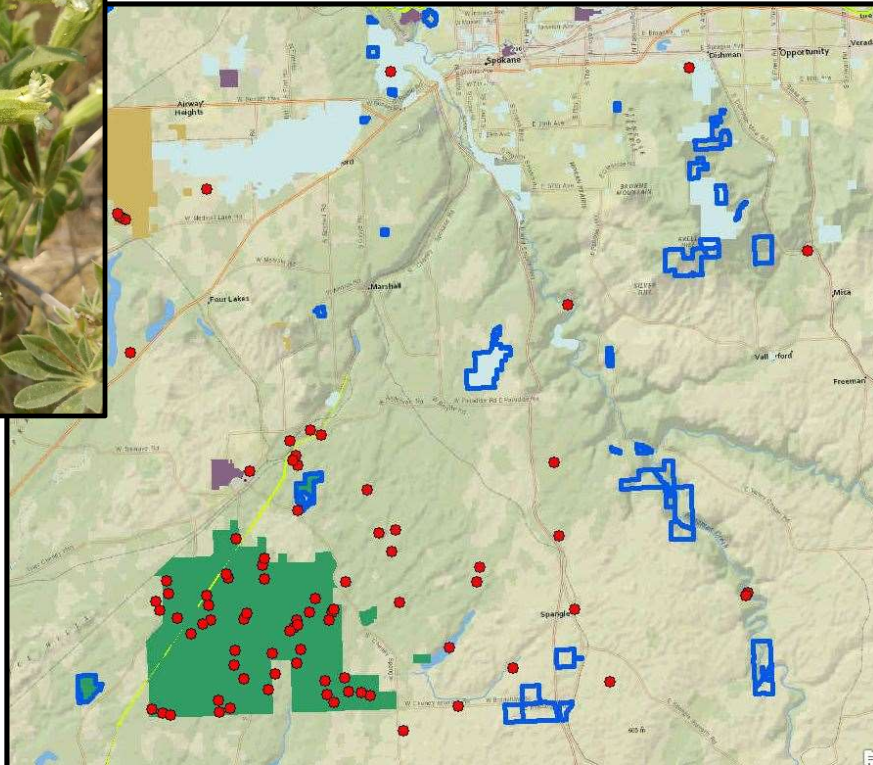


WA rare plant occurrences circa 2018

Botany Program

- Track 365 vascular plant species and 56 lichen & bryophyte species
- Approximately 3800 occurrence records
- New records being added & updated by WNHP and partners
- Provide data and share expertise with federal & state agencies, consultants, researchers, students, etc.

NATURAL HERITAGE PROGRAM

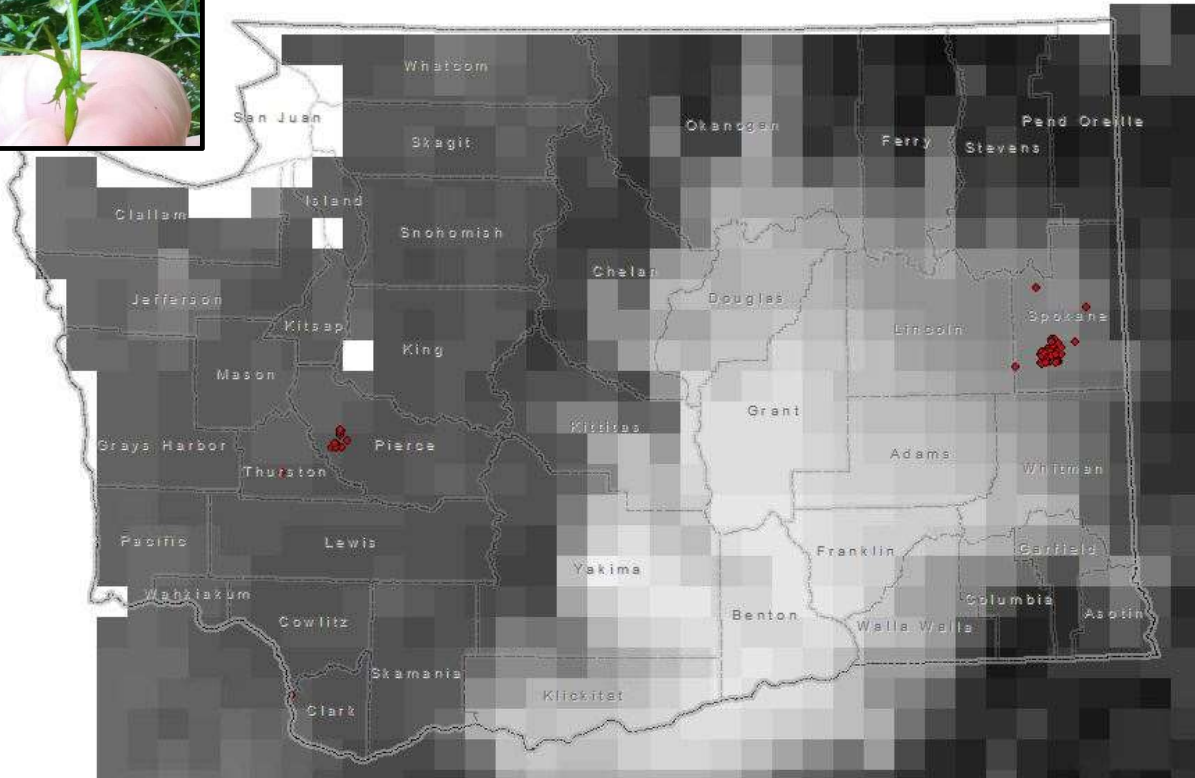


Protected Lands Project

- Documenting the occurrence of USFWS listed and WNPS rare plants species on private protected lands
- Chelan Douglas Land Trust

Rare plant occurrences (including *Silene spaldingii*) (red dots) and protected areas near Spokane. Note the dearth of occurrences within existing land trust areas (blue). Is this an artifact of lack of survey on these lands?

NATURAL HERITAGE PROGRAM



Climate Change Vulnerability Index

- NatureServe rating system assessing vulnerability of plants, animals, & ecological systems to climate change
- Based on 26 environmental & life history factors
- Means to compare vulnerability across species
- Project to do CCVI for 40+ USFS/BLM Sensitive plants

Howellia aquatilis (red) compared to annual moisture (darker = more moisture based on AET:PET). Note the Spokane area is becoming drier.

NATURAL HERITAGE PROGRAM

Wyoming Field Guide Select Language

Field Guide Home Search [Alt+Shift+S]

Kingdom: **Plants**
Phylum: **Flowering Plants**
Class: **Dicots**
Order: **Mints, Bladderworts, Snapdragons**
Family: **Snapdragons, Speedwells, Plantains**
Species: **blowout beardtongue**

Plantae
Anthophyta
Dicotyledoneae
Lamiales
Plantaginaceae
Penstemon haydenii

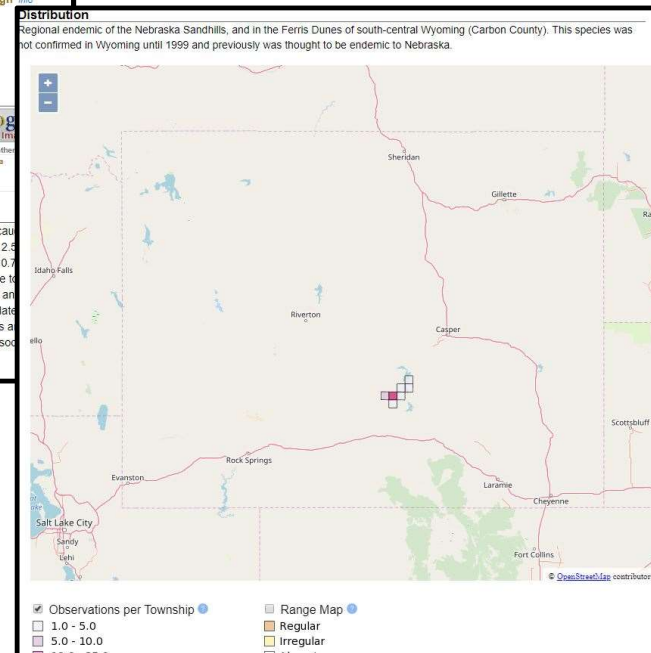
blowout beardtongue - *Penstemon haydenii*
Other common names: *blowout penstemon*

Global: G1G2 info
State: S1
Range Context: Regional Endemic/Edge info
Wyoming Contribution Rank: VHigh info
WYND Status: SOC status info

Agency Status:
USFWS: LE USFWS info

External Links
NatureServe Species Preprint
Google for more info
Google for more Web Pages

Description
Blowout penstemon is a perennial herb with one to many glabrous upright or decumbent stems arising from a branched caudex rooting from buried nodes. Vegetative stems are usually less than 30 cm tall and have greenish-blue, waxy, linear leaves 2.5 cm long and 0.3-1 cm wide. Flowering stems have narrow basal leaves and broad-based, clasping, waxy upper stem leaves 0.7-1.5 cm long and 0.3-1 cm wide that taper abruptly to a narrow tip. The inflorescence is 6-16 cm long with 3-6(10) compact, leafy whorls of milky-blue to lavender flowers (rarely pink or white). Bracts of the inflorescence are broad and heart-shaped at the base and narrow to an acute tip. Individual flowers are 23-25 (30) mm long with tubular, bi-lobed and faintly vanilla-scented corollas that are broadly dilated at the base. The glabrous, linear sepals. Anther sacs are 1.8-2 mm long and glabrous. The sterile staminode is glabrous or hairy. Fruits are 2-3 mm long capsules, acute, with light-brown, disc-shaped seeds that have narrowly winged margins (Great Plains Flora Assoc. 1986, Dorn 2001).



Sample pages from WY Field Guide

Online Field Guide

- Revision to pdf version of 2011 *Rare Plant Field Guide*
- “Common” Field Guide being developed in multiple Natural Heritage Programs
- About 60 new species
- More content and more interactive
- Will draw data from Biotics database – easy to update

NATURAL AREAS PROGRAM

Conserving Washington's native species and ecosystems, today and for future generations



NATURAL AREAS PROGRAM

**57 Natural Area Preserves & 38 Natural Resources
Conservation Areas currently total ~165,000 acres**



Washington's Natural Areas

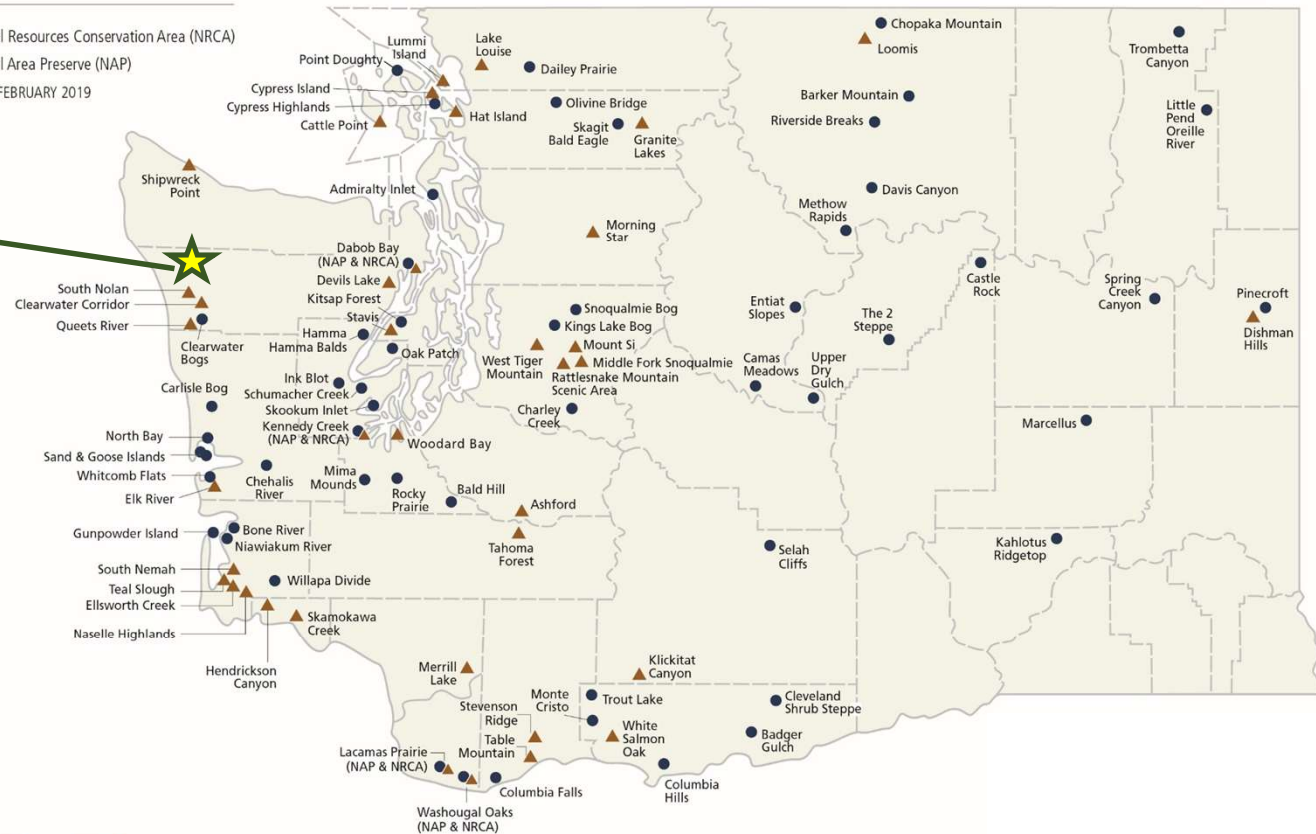


Our 95th Natural Area!



Crowberry Bog NAP
Added summer 2019

- ▲ Natural Resources Conservation Area (NRCA)
 - Natural Area Preserve (NAP)
- AS OF FEBRUARY 2019



- 40,800 acres at 57 Natural Area Preserves
- 124,200 acres at 38 Natural Resources Conservation Areas

NATURAL AREAS PROGRAM

Key Goals and Activities

HEALTHY ECOSYSTEMS

Keeping habitats and ecosystems healthy through science-based management and restoration

BIODIVERSITY

Protecting Washington's native biodiversity and our most vulnerable plant and animal communities

VALUING NATURE

Strengthening public appreciation of nature by promoting environmental education, exploration and scientific research on natural areas

FOSTERING PARTNERSHIPS

Creating innovative ways to care for natural areas through community engagement and partnerships

NATURAL AREAS PROGRAM

Research Partnerships

More than 400 research projects and other studies on DNR natural areas since 1972

- **Topics have been highly varied, including:**
 - studies related to air and water quality
 - soil ecology, genetics
 - ecosystem monitoring
 - geologic events
 - rare species recovery
 - fossil distribution
 - climate change
 - cultural histories

Research participants have included:

- **Federal and state agencies**
- **Universities and colleges, such as:**
 - Washington State University, University of California-Berkeley, Duke University, University of Kansas, and, in Canada, the University of Alberta, and the University of Guelph
- **Local, regional, and international non-profit organizations, such as:**
 - Dishman Hills Conservancy, the San Juan County Land Bank, the Institute for Applied Ecology, the Natural History Museum of Los Angeles, The Nature Conservancy, and the Canadian Museum of Nature

NATURAL AREAS PROGRAM

Future Research of Interest to DNR

Future topics to help inform natural areas management include:

- **Influences of climate change**
 - Natural area planning and design
 - Restoration targets
- **Invasive Species Ecology**
 - Invasiveness and invasibility
 - Alternative control methods
- **Rare Species Ecology and Restoration**
 - Butterfly habitat restoration
 - Pollination ecology
 - Introductions and re-introductions
- **Ecosystem and Community Ecology**
 - Disturbance dynamics
 - Community assembly
- **Restoration Ecology**
 - Minimum patch size and connectivity thresholds
 - Soil ecology

NATURAL AREAS PROGRAM — Education Partnerships

Current Education on DNR Natural Areas:

- **Most likely to occur at sites with developed access (Remember your *Discover Pass*!)**
 - Individual, self-guided with interpretive signs
 - School groups, all grade levels
 - University classes, including some students working on research projects
 - Community organizations
- **Guided visits**
 - General site education, often combined with a volunteer opportunity
 - Limited frequency due to competing demands for staff time
- **Future Activities**
 - DNR will join with partners on a formalized, programmatic education opportunities, such as with school districts via the Pacific Education Institute
 - Coordinate additional volunteer activities, such as “citizen science” outings or “bio blitzes” to gather or reconfirm site information

The screenshot shows the Washington DNR website interface. At the top, it says "Explore Washington DNR-managed lands" and provides navigation instructions. Below this are tabs for "Accessible Amenities Available", "Campground", "Day Use Area", and "Trailhead use: m". A map of Washington state is displayed with various natural areas marked with numbered orange icons. A detailed view of site 8, "Chehalis River Surge Plain", is shown in a pop-up window. This window includes a photo of a wooden deck overlooking a river, a description of the site, and a list of amenities.

www.dnr.wa.gov/go

8 Chehalis River Surge Plain

The Chehalis River Surge Plain is Washington's biggest and best tidal surge plain. This Natural Area Preserve's gentle 3.5-mile interpretive trail and a 0.25-mile shoreline access trail offers families the perfect opportunity to learn about the functions of a surge plain and the native plants and wildlife that call this area home.

What to do: Hike, view, access the water, fish

Amenities: Three picnic tables, interpretive sign, toilet, hand boat launch, accessible trail

NATURAL AREAS PROGRAM

Get to know DNR Natural Areas

www.dnr.wa.gov/managed-lands/natural-areas

Chehalis River Surge Plain Natural Area Preserve



Kennedy Creek Natural Area Preserve



Morning Star NRCA



Cattle Point Natural Resources Conservation Area



Contact Information for the Washington Natural Areas Program September 2019

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Keyna Bugner
Southeast Region
Natural Areas Manager
509-925-0906
keyna.bugner@dnr.wa.gov

DNR CONSERVATION AND CLIMATE CHANGE

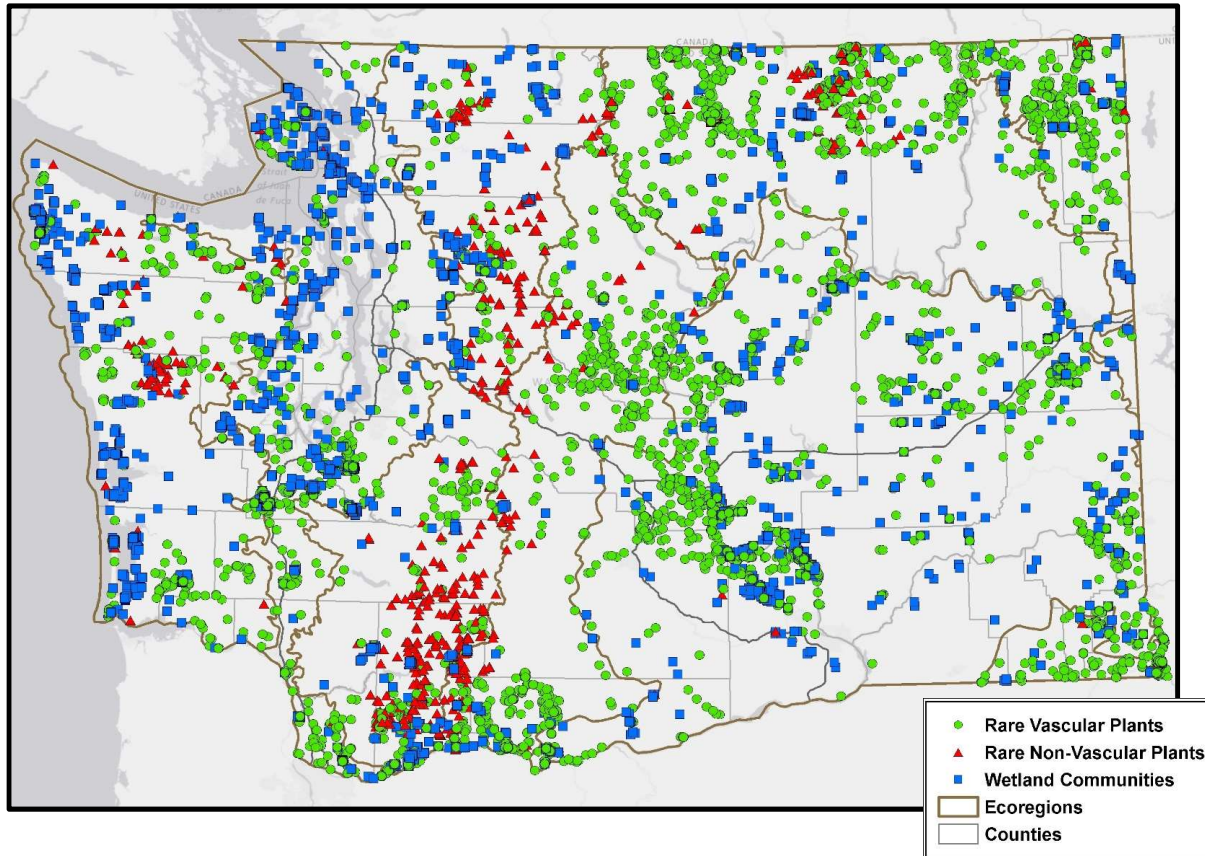
Activity	Need for change due to climate impacts	
	Near Term	Long Term
Natural Heritage Program		
Conservation Planning & Site Design	High	High
Data collected during field surveys	High	High
Species Inventory	Medium	High
Ecosystem Inventory	Medium	High
Species Prioritization	Medium	High
Ecosystem classification	Low	High
Ecosystem prioritization	Low	High
Natural Areas Program		
Monitoring	High	High
Site analysis and redesign	Medium	High
Maintenance of existing elements	Low	High
Reintroduction of species	Low	High
Weed control	Low	Medium
Restoration of degraded lands	Low	Medium



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NATURAL HERITAGE PROGRAM



Datasets

- Rare plants & rare / high quality ecosystems
- Oaks & grasslands of Puget Trough ecoregion
- Ecological systems of Washington
- Wetlands of High Conservation Value map viewer

<https://www.dnr.wa.gov/NHPdata>

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SMALL GROUP DISCUSSIONS

Connectivity and Conservation Priorities	Ecosystem Assessment and Mapping	Outreach and Education	Research Needs
Facilitator: John Gamon	Facilitator: Tynan Ramm-Granberg	Facilitator: Walter Fertig	Facilitator: Joe Rocchio

Questions

- What are you doing?
- What do you want to do?
- What do you need?



SMALL GROUP DISCUSSION FOLLOW-UP

Connectivity and Conservation Priorities	Ecosystem Assessment and Mapping	Outreach and Education	Research Needs
Facilitator: John Gamon	Facilitator: Tynan Ramm-Granberg	Facilitator: Walter Fertig	Facilitator: Joe Rocchio

Questions

- What are the common themes?
- Are there areas for collaboration?



