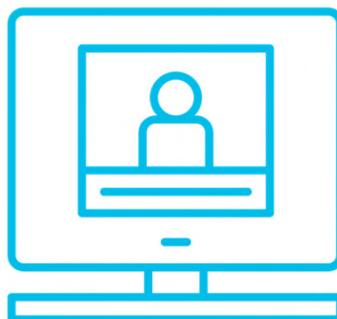


Welcome

YOU ARE IN THE RIGHT SPOT. WE WILL START AT 9:00 AM.



Fish and Wildlife Habitat Conservation Areas

Designating and Protecting Your FWHCAs

FEBRUARY 10, 2021

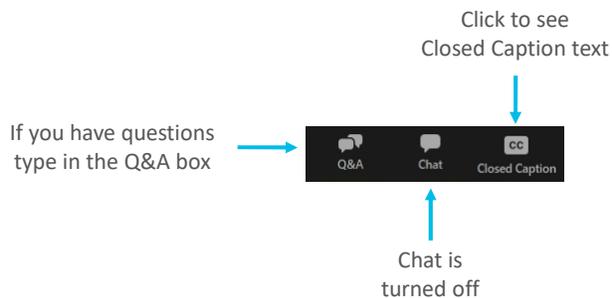


2021 Critical Areas and Shoreline Monitoring & Adaptive Management Online Workshops



Welcome to
Fish and Wildlife Habitat Conservation Areas

2021 Critical Areas and Shoreline Monitoring & Adaptive Management Online Workshops



2021 Critical Areas and Shoreline Monitoring & Adaptive Management Online Workshops

The screenshot shows a webinar slide with a dark blue background. On the left, the title "How to Successfully Protect Critical Areas and Shorelines: A Step-by-Step Introduction to Monitoring and Adaptive Management" is written in white. Below the title, it says "JANUARY 13, 2021". On the right, there are logos for the Washington Department of Fish and Wildlife, the Washington State Department of Commerce, and the Department of Ecology, State of Washington. To the right of the logos is a video feed showing two participants: a woman named Maria Schmidt and a man named Scott Kupper. An arrow points to the video feed with the text "Click in between to change size".

5

Visit Project Website for More Information

https://www.ezview.wa.gov/site/alias_1992/37576/overview.aspx

The screenshot shows the website for "Critical Areas Adaptive Management Training Workshops". The page has a header with the "ez view" logo and navigation tabs for "Overview", "Contacts", "Events", "2021 Workshops", and "Library". The main content area is titled "2021 Workshops" and contains the following text:

Do you want to know if your critical areas and shoreline regulations are working as intended? Or how to effectively track special permit conditions and mitigation requirements?

Please join us for an in depth review of best practices, case studies, resources, and tools to enhance monitoring and adaptive management efforts for your critical areas and shorelines.

As a follow-up to our 2018 workshops, this 11-week webinar series features expert guest speakers, opportunities for peer-to-peer learning, information sharing, and individual technical assistance.

Earn AICP continuing education credits for your attendance!

Click on a link below to register. (Most sessions are 90 minutes. A couple sessions may go up to 2 hours.)

- Adaptive Management Workshop 1 – How to Successfully Protect Critical Areas and Shorelines: A Step-by-Step Introduction to Monitoring and Adaptive Management
- Adaptive Management Workshop 2 – Setting the Stage: Successful adaptive management and critical areas monitoring opportunities
- Adaptive Management Workshop 3 – Wetlands
- Adaptive Management Workshop 4 – Geologically Hazardous
- Adaptive Management Workshop 5 – Fish and Wildlife Habitat Conservation Areas
- Adaptive Management Workshop 6 – Frequently Flooded Areas
- Adaptive Management Workshop 7 – Critical Aquifer Recharge Areas (CARAs)
- Adaptive Management Workshop 8 – Shoreline
- Adaptive Management Workshop 9 – Permit Implementation Monitoring Tools
- Adaptive Management Workshop 10 – CAO Performance Indicators
- Adaptive Management Workshop 11 – Adaptive Management Interactive Workshop

6

2021 Critical Areas and Shoreline Monitoring & Adaptive Management Online Workshops



This project has been funded wholly or in part by the United States Environmental Protection Agency under assistance agreement PC-01J2230116-05251 through the Washington Department of Fish and Wildlife.

The contents of this document do not necessarily reflect the views and policies of the Environmental Protection Agency or the Washington Department of Fish and Wildlife, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

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Workshop Wednesday Series Lineup

Register using Zoom.



January 13 - 9:00 a.m. - 11:00 a.m.
How to Successfully Protect Critical Areas and Shorelines: A Step-by-Step Introduction to Monitoring and Adaptive Management



February 24 - 9:00 a.m. - 11:00 a.m.
Critical Aquifer Recharge Areas (CARAs)



January 20 - 9:00 a.m. - 11:00 a.m.
Setting the Stage: Successful adaptive management and critical areas monitoring program basics



March 3 - 9:00 a.m. - 11:00 a.m.
Shorelines



January 27 - 9:00 a.m. - 11:00 a.m.
Wetlands



March 10 - 9:00 a.m. - 11:00 a.m.
Permit Implementation Monitoring Tools



February 3 - 9:00 a.m. - 11:00 a.m.
Geologically Hazardous Areas



March 17 - 9:00 a.m. - 11:00 a.m.
CAO Performance Indicators



February 10 - 9:00 a.m. - 11:00 a.m.
Fish and Wildlife Habitat Conservation Areas



March 24 - 9:00 a.m. - 11:00 a.m.
Adaptive Management Interactive Workshop



February 17 - 9:00 a.m. - 11:00 a.m.
Frequently Flooded Areas

Note: Workshop names may change but topic will stay the same.

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American Planning Association Education Credit

GO TO: [HTTPS://PLANNING.ORG/EVENTS/EVENTMULTI/9210027/](https://planning.org/events/eventmulti/9210027/)

The screenshot shows the American Planning Association (APA) website. At the top, there is a navigation bar with links for 'About APA', 'Join', and 'Log In'. Below this is a search bar with the text 'Enter keyword or phrase' and a 'Search' button. The main navigation menu includes 'Membership', 'Knowledge Center', 'Education and Events', 'AICP', 'Policy and Advocacy', 'Career Center', 'In Your Community', 'Connect with APA', and 'APA Foundation'. The page content is titled '2021 Critical Areas and Shorelines Monitoring and Adaptive Management Online Workshops' and is organized by the 'APA Washington Chapter'. It lists two dates: 'Wednesday, February 3, 2021, 9 a.m.' and 'Wednesday, March 24, 2021, 11 a.m. PDT' in Olympia, WA, United States. An 'OVERVIEW' section states that the event is in partnership with the Washington State Department of Ecology and the Washington State Department of Fish and Wildlife, and is an 11-week webinar series.

Land Acknowledgment

Discover which tribal lands you reside on text your zip code to (907) 312-5085.



Poll



Question:



What size jurisdiction do you work with?

What is your role?

How long have you worked on critical areas?

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Meet Your Presenters



Keith Folkerts is currently leading WDFW's efforts to convey agency information about Priority Habitats and Species (PHS) to local governments in support of their regulatory efforts under the Growth Management Act and Shoreline Management Act. During his 7 years at WDFW, he has worked on PHS riparian management recommendations and High Resolution Change Detection, served as a member of the Voluntary Stewardship Program Technical Panel, and has been the project manager for several grants with the Puget Sound Partnership. Prior to working for WDFW, Keith worked for Kitsap County in the Department of Community Development, Public Works Department, and Commissioners Office in positions that included Watershed Planner, Stream Team Coordinator, and Natural Resources Coordinator.

Prior to working for Kitsap County, Keith served as Surface Warfare Officer, including deployments to the Arabian Gulf during the Gulf War. Keith has BA in political science from the US Naval Academy in Annapolis, Maryland. Outside of work, Keith enjoys backpacking, kayaking, gardening, and trying to keep up with his three daughters and marathon-running wife.

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Today's Presentation Topics

1. **FWHCA Best Practices**
 - Tips for success in your efforts to protect fish and wildlife
2. **Requirements and Definitions**
 - RCWs and WACs
3. **Live Demo and Description of Resources from WDFW**
 - Priority Habitats and Species Program online resources
4. **Description and Demo of Resources from DNR**
 - Natural Heritage Program online resources

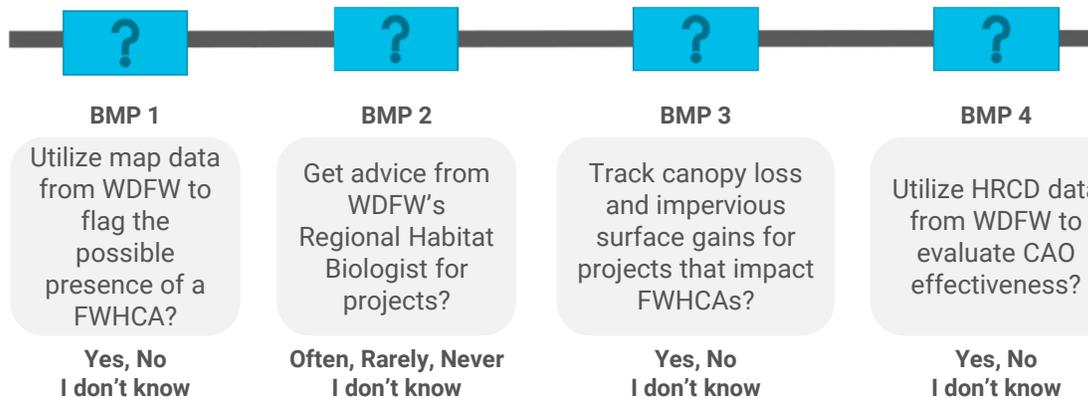
13

Part 1: FWHCA Best Practices

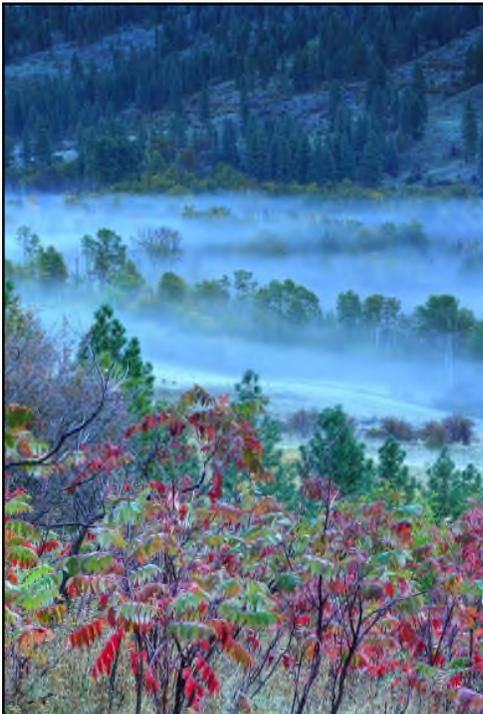
FWHCA Best Practices Survey



Does your jurisdiction...



15



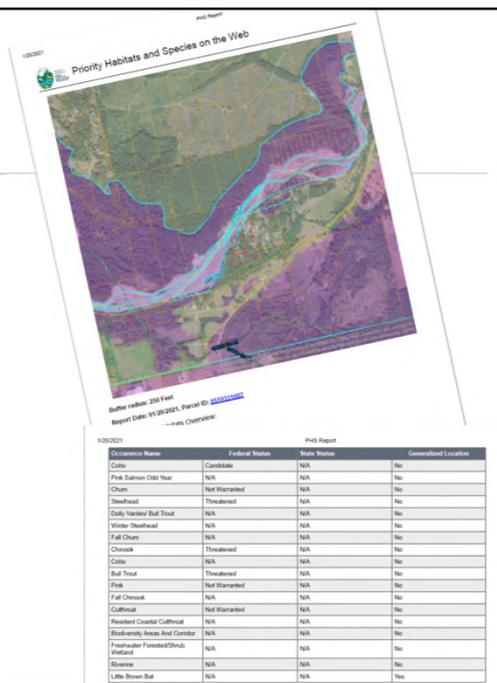
Best Practices for FWHCAs

- Utilize **PHS on the Web** reports and **DNR NHP** resources.
- Unsure how to maintain "ecosystem functions"? Get advice from your **Regional Habitat Biologist**
- What to track? Start with losses and gains of **canopy cover** and **impervious surfaces** within critical areas
- Use **High Resolution Change Detection** to monitor FWHCAs. All you need is a GIS layer of the critical area.

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PHS on the Web reports

- Simple way to check for PHS “hits”
- Public can use it
- Permit reviewers can use it
- Caveats
 - Doesn't include all types of Priority Habitats (doesn't show riparian areas, for example)
 - Species exist in places we haven't surveyed
 - Validate this regional info with site-scale info



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Phone a Friend

- It's complex
- WDFW Habitat Biologists are a resource
- Use the map to get contact info
- Caveats
 - Staff are stretched thin
 - Refer to our written management recommendations



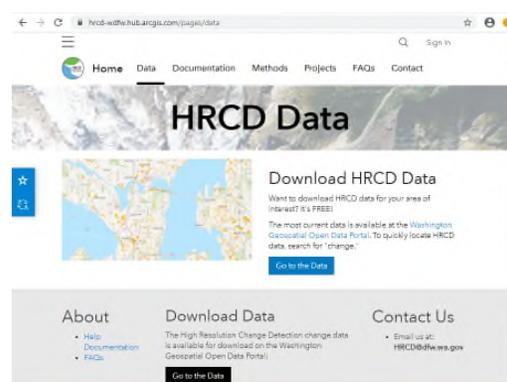
Why is WDFW involved with this?

- Mission: Perpetuate fish and wildlife and the ecosystems upon which they depend
 - The public owns all fish & wildlife.
 - WDFW in trustee role.
- Our success depends upon your success
 - For many species direct habitat loss is the largest threat
 - Agency keenly aware of the importance of conserving habitat as the landscape evolves



Local Government BMPs: Monitoring Change

Subject of our March 17 webinar



March 17 - 9:00 a.m. - 11:00 a.m.
High Resolution Change Detection

Part 2: FWHCA Requirements and Definitions

RCW and WAC



What does the GMA require of jurisdictions regarding FWHCAs?

That each jurisdiction's development regulations:

1. Protect the functions and values of critical areas.
2. Include the best available science.
3. Give special consideration to conservation or protection measures necessary to preserve or enhance anadromous fisheries.

RCW 36.70A.172 (1)

FWHCA Protection Standards

- **No Net Loss (365-196-830)(4)**
 - ...If development regulations allow harm to critical areas, they must require compensatory mitigation of the harm. **Development regulations may not allow a net loss of the functions and values of the ecosystem** that includes the impacted or lost critical areas...
- **Viable Populations (365-190-130(1))**
 - ...so that the habitat available is sufficient to support **viable populations over the long term** and **isolated subpopulations are not created...**



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FWCHA Minimum Protection Guidelines

How to protect?

Jurisdiction are to provide protection through a variety of development regulations

- Critical Area regulations
- Development densities
- Urban growth area boundaries
- Open space corridors
- Incentive-based land conservation and stewardship programs

(WAC 365-190-130)(1)





FWCHA Minimum Protection Guidelines

What to Areas to Protect?

- *Primary Association* areas
 - State and federally listed at-risk animals and plants
 - WDFW PHS Priority Species
 - DNR rare plants and high-quality ecological communities
- Habitats and Species of Local Importance
- Other specified areas
 - Waters of the State, forage fish spawning areas, kelp/eelgrass/shellfish beds, natural area preserves, ...

WAC 365-190-130(2) and (4)

FWHCA Assistance Survey



How interested are you in assistance with...

			
Topic 1	Topic 2	Topic 3	Topic 4
Understanding your “populations” and “population viability”	Protecting FWHCAs when expanding UGAs and taking other actions not tied to the CAO	Identifying WDFW-recommended <i>primary association</i> areas	Identifying habitats and species of local importance
Very Interested Somewhat interested Not interested			

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What other Laws affect FWHCAs?

- ESA
- Bald & Golden Eagle Protection Act
- USFWS IPaC tool for ESA species:
<https://ecos.fws.gov/ipac/>



Q&A - RCW/WAC REQUIREMENTS

TYPE YOUR QUESTIONS IN THE Q&A BOX IN YOUR TOOLBAR



Part 3: FWHCA Resources from WDFW

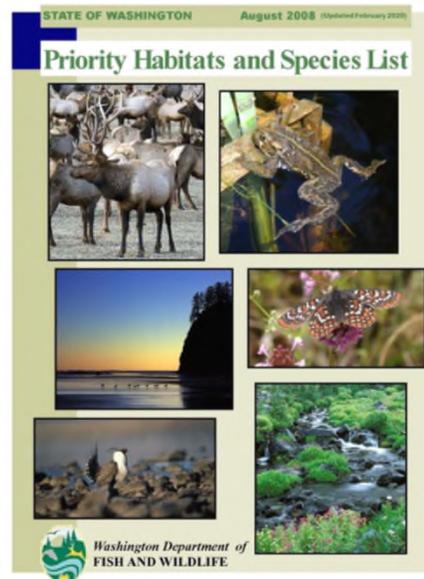
The collage features four main components:

- Photo Gallery:** A grid of images showing riparian habitats and wildlife, including a duck and a frog. The date "December 2020" is visible at the top.
- Priority Habitats and Species List:** A list of six images representing various species and habitats, with the Washington Department of Ecology logo at the bottom.
- Riparian Ecosystem Diagram:** A cross-sectional diagram labeled "Time 1" showing the relationship between uplands, riparian zones, and an active channel. It identifies zones of influence, riparian management zones, and channel migration zones.
- Map:** A map of Washington state with a pink overlay indicating riparian areas. Major cities like Seattle, Tacoma, and Olympia are labeled.

WDFW PHS Resources for FWHCAs
WDFW's Priority Habitats and Species Program

PHS Resources: PHS List

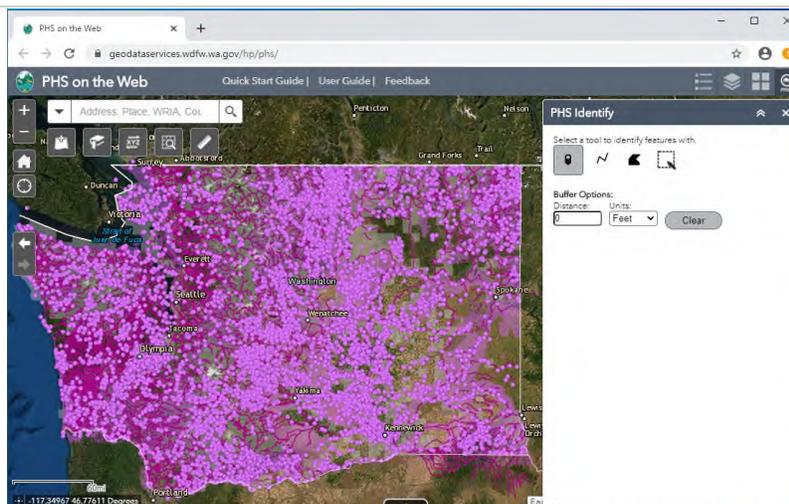
- Helps you identify, classify and designate locally important habitats and species
- Criteria-based, carefully vetted list
 - 20 Priority Habitats
 - 182 Priority Species plus 10 groups of species
- Plus additional info
 - County-level distribution map
 - State- and federal listing status
 - Priority Area(s) (“primary association areas”)
 - Sources of additional Info



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PHS Resources: PHS on the Web

- Link on PHS Maps webpage
- Where are known locations of Priority Species and Priority Habitats?



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Tools for designating FWHCAs: PHS Data (including sensitive data)

- Locations of some Priority Habitats and Priority Species is “sensitive”
 - Exempt from disclosure under state’s Public Records Act
- Get digital data or maps with sensitive data after signing a non-disclosure agreement
- Link on PHS Maps webpage
- phsproducts@dfw.wa.gov

Washington Department of Fish and Wildlife
Mailing Address: PO Box 43200 • Olympia, WA 98504-3200 Main Office Location: Natural Resources Building • 1111 Washington Street SE • Olympia, WA

FISH AND WILDLIFE ORDER FORM
FOR PRIORITY HABITATS AND SPECIES INFORMATION

INSTRUCTIONS
Please complete this order form clearly and completely to request maps and/or digital data on locations of priority species and habitats, failure to do so may cause your request to take longer to process. For descriptions of standard products and prices see the *Priority Ordering Habitats and Species Information* sheet which accompanies this form or visit our web site at http://dfw.wa.gov/conservation/pbs/maps_data. E-Mail completed form to: phsproducts@dfw.wa.gov, mail to Washington Department of Fish and Wildlife, Priority Habitats and Species, PO Box 43200, Olympia WA 98504-3200 or fax to (360) 902-2946. You will receive an invoice itemizing the costs for your request and instructions for submitting payment. Sorry, we do not accept payments by credit card. For questions call (360) 902-2543. For information on state listed plants contact the Washington Department of Natural Resources at: <http://www.dnr.wa.gov/node/343>.

Name: _____ E-Mail (optional): _____
Agency/Organization: _____
Address: _____
City: _____ State: _____ Zip Code: _____
Phone Number: _____ Date of Request: _____

Does your agency/organization have a Release Agreement, which includes you as the Authorized Representative or Technical Contact, on file with the Washington Department of Fish and Wildlife regarding the confidentiality of sensitive information?
 Yes No Don't Know

Identify yourself as one of the following:
 Private owner of land covered by this request Tribe Utility Conservation organization Government Agency
 Consultant representing (please circle one) Private Landowner, Tribe, Utility, Conservation organization, Government Agency
 If Government Agency or representative please specify agency name and type (Federal, State etc.)
 Researcher with a university Other (please specify) _____

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Getting Technical Assistance from WDFW

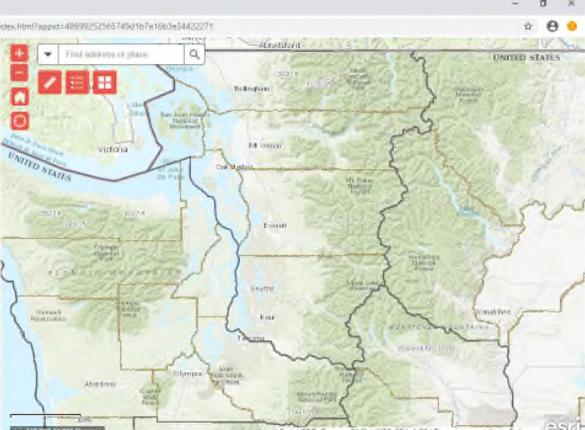
- Who to contact?
- Areas of Responsibilities map
- Link on main PHS webpage
- Brief demo

Washington Department of Fish & Wildlife

Areas of Responsibilities Map:
WDFW Assistance

To find out who to contact for assistance:
1) Enter your full address in the Search tool (upper left corner of the map by the magnifying glass) and choose the location from the list that appears. The map will then zoom to that location.
2) Or zoom in and pan to your area of interest.
3) Then click on the map at the approximate location of your project and a pop up box will provide the name and contact info for WDFW staff who can get you the answers you need.

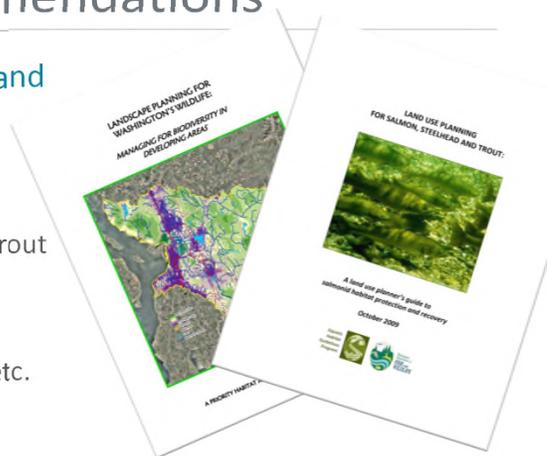
This map currently provides contact info for WDFW Habitat Biologists who are public with:



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PHS Management Recommendations

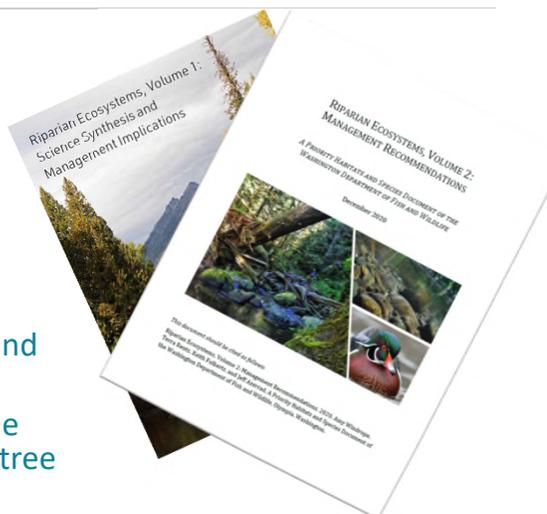
- Helps you understand ecosystem functions and how to protect them
- **Broad**
 - **Landscape Planning** for Washington's Wildlife
 - **Land Use Planning for Salmon, Steelhead and Trout**
- **Specific**
 - Habitats: Shrub-steppe, Oak Woodlands, etc.
 - Species: Mammals, Birds, Amphibs & Reptiles, etc.
- **Most recent: Riparian**
 - Volume 1: Science synthesis (304 pages)
 - Volume 2: Management Recommendations (69 pages)



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PHS Riparian: 5 Key Ecosystem Functions

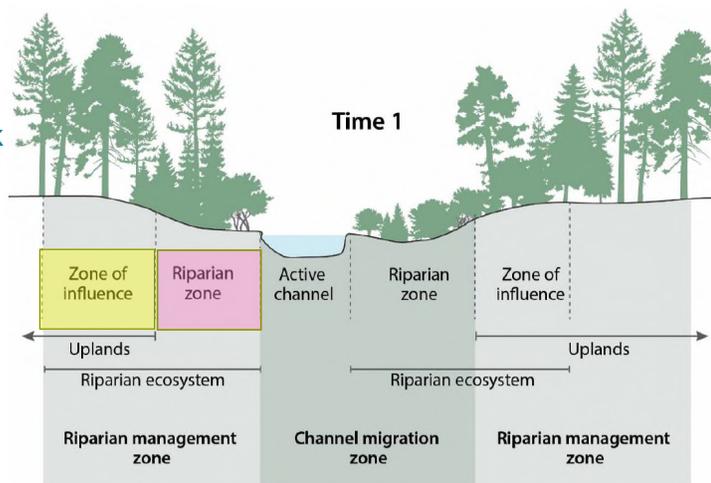
1. **Bank stability**
 2. **Shade**
 3. **Pollution removal**
 4. **Contributions of detrital nutrients**
 5. **Contributions of large woody debris**
- Land use changes should avoid, minimize, and compensate for harm to these functions
 - Functions are provided from area within one site-potential tree height of a 200-year-old tree



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PHS Riparian: RMZ Width in Forested Regions

- Width = 200-year Site Potential Tree Height (SPTH₂₀₀)
- Measure from wider of bank and Channel Migration Zone
- Minimum 100' (pollution removal)
- “Protecting functions within SPTH₂₀₀ is a scientifically supported approach if the goal is to protect and maintain full function of the riparian ecosystem”



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Site-Potential Tree Height (SPTH₂₀₀) tool

- [Link on PHS Management Recommendations webpage](#)
- [Brief Demo](#)

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In Partnership with Local Governments

- Internal CAO Evaluation form
 - Helps our Habitat Bios evaluate your CAO
 - Helps foster dialog among Bios and Planners
 - Ensures our comment letters are on-task and not a surprise

CRITICAL AREAS ORDINANCE EVALUATION FORM

PURPOSE AND INSTRUCTIONS

This tool is designed to provide a standard means of assessing jurisdictions' CAOs to (1) help WDFW regional staff prioritize topics of interest in CAO updates (2) inform WDFW regional decisions about staff time allocation and (3) to assess jurisdictions' use of PHS resources. This need can be fulfilled without answering every question on this form—if you don't know an answer and cannot find it in a timely manner skip the question. If an answer to that question is needed for the evaluation to accomplish its purpose the issue can be brought up again, perhaps with the assistance of a local government staff or another agency expert. We encourage you to fill out this evaluation in collaboration with others (county staff, other WDFW Habitat Biologists, etc.).

The WDFW Habitat Biologist assigned to the jurisdiction should complete this assessment before an update to identify WDFW's priority topics for the update and after an update to document the impact of the update and set the groundwork for the next update. Referring to the place in the County Code where the item is located ("Code ref.")—with a hyperlink if you wish—will make updating this form easier in the future.

Copies of this form are in the folder [S:\HP\Ecosystems\GMA\CAO Evaluations\](#), see filename in footer.

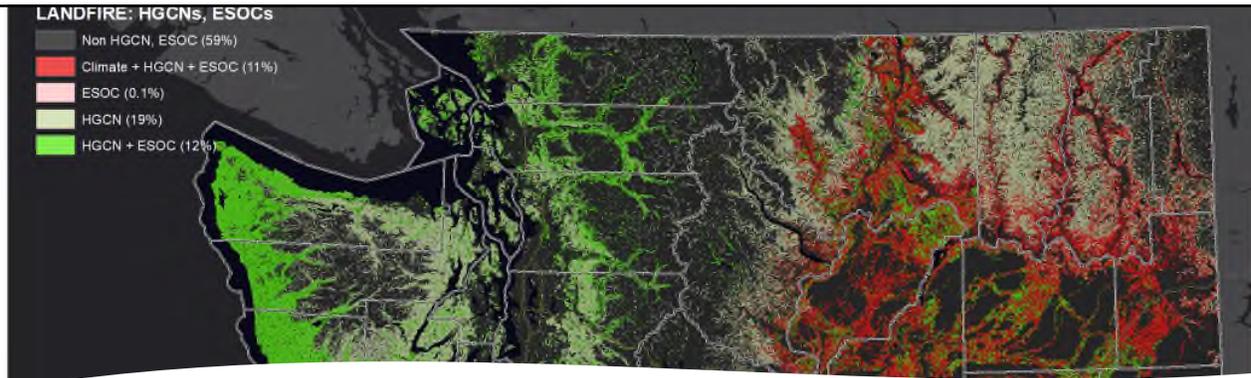
When you have filled out this form save it as <CAO_County_MMMYY> (date is when the form is filled out, e.g. CAO_Kitsap_Jun19) in [S:\HP\Ecosystems\GMA\CAO Evaluations\County names](#).

Studying the CAO and filling out this form is expected to take 2-4 hours. There is space for feedback at the bottom of the form. If you have questions about this form contact your Regional Habitat Program Manager or the Land Use Conservation & Policy Section Manager (Mary Huff, 360-902-8806).

Thank you for your efforts to conserve Washington's fish and wildlife.

Jurisdiction	
Jurisdiction being evaluated:	Click here to enter text.
Name of evaluator:	Click here to enter text.
Date of evaluation:	Click here to enter a date.
Date CAO most recently amended:	Click here to enter a date.
Paste link to CAO here:	Click here to enter text.
Names & affiliation of others from WDFW, local jurisdiction, tribes or other agencies who assisted in completing this evaluation:	Click here to enter text.

S:\HP\Ecosystems\GMA\CAO Evaluations\CAO Evaluation Form July 2019.docx Revised: 1/21/2021



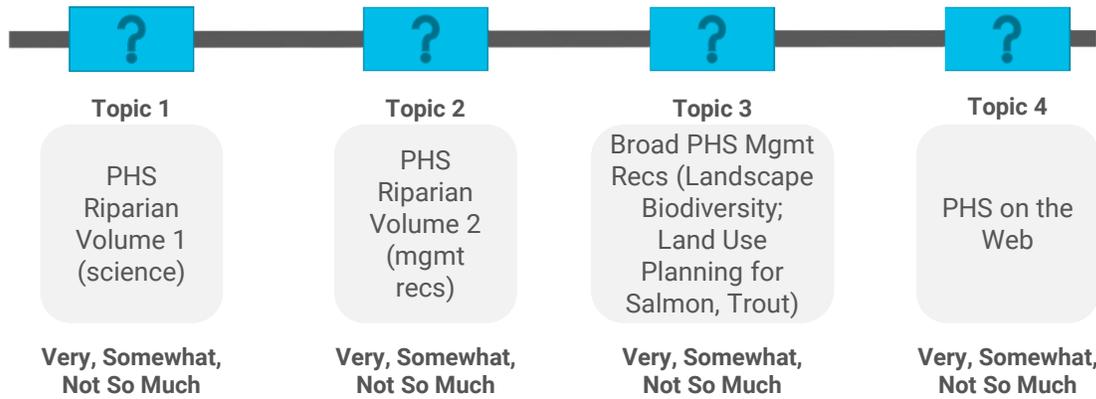
How can PHS be More Useful?

- Focus on polygons rather than points; convey importance
- Show management recommendations spatially
- Align with nationwide science and State Wildlife Action Plan
 - Ecological Systems of Concern (ESOCs)
 - Habitats of Greatest Conservation Need (HGCNs)
 - Climate Sensitive Ecological Systems
- Guidance on monitoring & adaptive management

FWHCA Assistance Survey



How interested are you in attending a webinar on...



Q&A - FWHCA RESOURCES FROM WDFW

TYPE YOUR QUESTIONS IN THE Q&A BOX IN YOUR TOOLBAR



Meet Your Presenter



Joe Rocchio is the Program Manager for the Washington Dept. of Natural Resources, Natural Heritage Program. He served as the Program's Vegetation Ecologist from 2007 to 2019 and focused his efforts on ecosystem classification, developing tools to assess ecological integrity, and identifying ecosystem conservation priorities. Prior to joining DNR, he spent 8 years with the Colorado Natural Heritage Program as a wetland ecologist. Although he has worked with all ecosystem types, wetlands (and especially peatlands) are his expertise. Joe received an M.S. in Ecosystem Analysis from the University of Washington in 1998.

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Part 4: FWHCA Resources from DNR

DNR Tools for FWHCA Designations

- **Program Mission**
 - “provide scientific expertise and information for effective conservation of Washington’s rich natural heritage.”
- **Primary activities**
 - Identify at-risk species and ecosystems
 - Conduct inventories for those elements
 - Identify conservation priorities
- **Staff**
 - Program Manager
 - Scientists
 - Information Management



Poll



Do you currently use Natural Heritage data for designating critical areas?

Natural Heritage Program (NHP) Data & FWHCAs

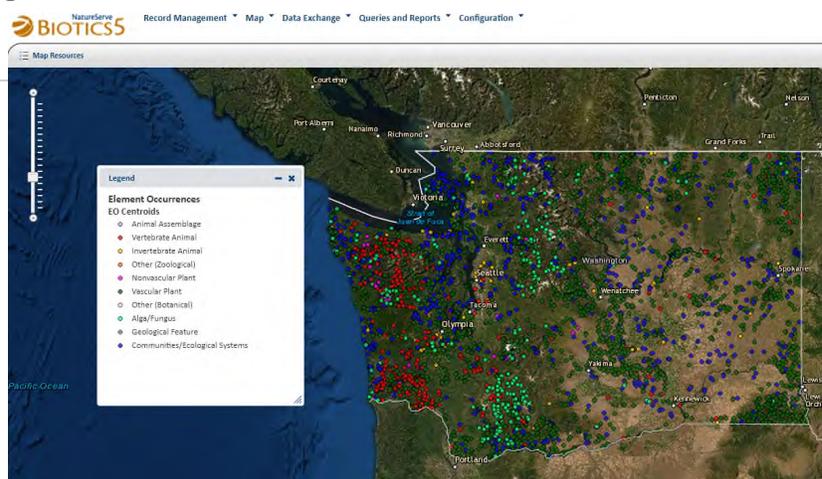
WAC 365-190-130 FWHCAs that must be considered for classification and designation include:	NHP Data
“Areas where endangered, threatened, and sensitive species have a primary association”	<ul style="list-style-type: none"> • Rare plant list • NHP GIS data set • NHP map viewer
“Habitats and species of local importance”	<ul style="list-style-type: none"> • Rare plant list/descriptions • Ecosystem list/descriptions • NHP GIS data set • NHP map viewer
“State natural areas preserves, natural resource conservation areas, and state wildlife areas”	<ul style="list-style-type: none"> • DNR-Natural Areas Program • NHP map viewer
“Potential for designating areas important for local and ecoregional biodiversity”	<ul style="list-style-type: none"> • NHP GIS data set • NHP map viewer

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Data Management and Distribution

Biotics Database

- Over 7000 records
- 3,846 rare plant records
- 2,492 ecosystem records
- 702 rare animal records



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Are there rare species and/or rare & high-quality ecosystems in your jurisdiction?

Lists & Spatial Data

Species & Ecosystem Lists

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

DNR Natural Area Preserves & Natural Resource Conservation Areas List

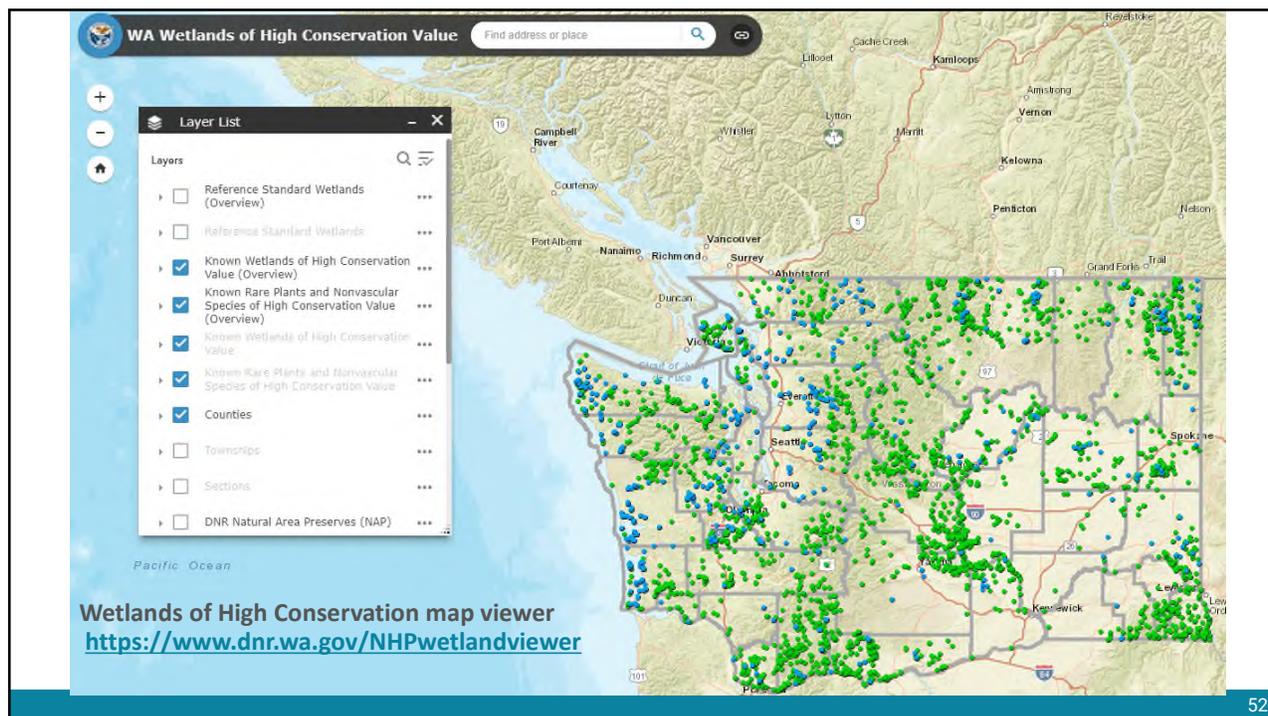
- <https://www.dnr.wa.gov/managed-lands/natural-areas>

Lists & Spatial Data

Spatial datasets

- WNHP Element Occurrence GIS dataset
<https://data-wadnr.opendata.arcgis.com/datasets/washington-natural-heritage-program-element-occurrences-current>
- Wetlands of High Conservation map viewer -
<https://www.dnr.wa.gov/NHPwetlandviewer>

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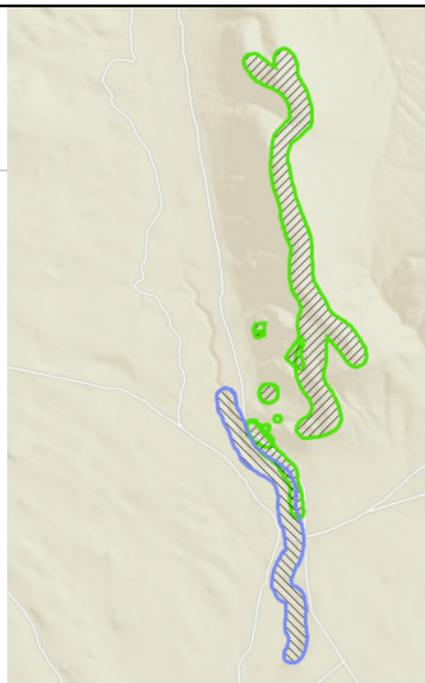


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How to avoid loss and/or impacts to those rare elements?

Avoidance is best

- Use GIS data and map viewer to identify locations
- Buffers
 - *Wetlands*
 - use Ecology's recommended buffers for 'Wetlands of High Conservation Value'
 - *Upland rare species/ecosystems*
 - variable, depending on ecosystem type



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Compatible land uses with rare species and ecosystems?

- DNR does not have explicit list
- Review NHP resources
- NHP staff input



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**Resources for learning more
about rare species / ecosystems**

Rare Plant Species

Field Guide to the Rare Plants of Washington

- <https://www.dnr.wa.gov/NHPfieldguide>
- Identification, habitat, distribution and threat information about **federal and state endangered, threatened, and sensitive species**
- Hard copy: <https://uwapress.uw.edu/book/9780295990927/field-guide-to-the-rare-plants-of-washington/>
- NatureServe Explorer - <https://explorer.natureserve.org/>

Rare Plant Field Guide

The online guide is an adaptation of the *Field Guide to the Rare Plants of Washington*, which was published in 2011 with the intent to aid amateur and professional botanists in the identification of our state's rare plant species. With the inclusion of descriptions from an earlier edition of the guide, this online version includes 141 vascular plants, ferns, and mosses and lichens. Each treatment includes information on identification, phenology, range, habitat, ecology, state status, inventory needs, threats, and references. Species and habitat photos, line drawings, and distribution maps are also included. An Android version is available for mobile applications.

The editorial review of the guide is the collaboration of a cooperative venture between the Washington State Department of Natural Resources' State Heritage Program (NHP), the Spokane District of the U.S.D.A. Bureau of Land Management (BLM), the Washington Native Plant Society, the University of Washington Herbarium at Burke Museum, and the University of Washington Press, funding for the online version provided by the U.S. Fish and Wildlife Service.

To find a species, click on the first letter of its scientific name, then select the species name from the list.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Carex pauciflora Lightf.
 few-flowered sedge
 Cyperaceae - sedge family
 status: State Sensitive, BLM sensitive, USFS sensitive
 rank: G5 / S2

General Description: A diploid from Flora of North America (1993+). Perennial with rhizomes 2-2.5 cm long. Stems single or in loose tufts, 4-4.5 dm tall. Vigorily roughened toward the top; lower leaves reduced to blades or nearly blades at maturity. Upper foliage leaves 2-2.5 (3) per stem; blades up to 2.5 cm x 0.5-1.0 mm, hairless.

Floral Characteristics: Spike single, terminal, with (1) 2-4 male flowers above, (1) 2-6 (7) female flowers below. Female stamens wider than and 2/3 the length of the perigynia; lower ones distichous. Perigynia reduced at maturity, light green, becoming straw-colored or pale brown, narrowly elongate-elliptic, (5) 5.0-7.0 x 0.7-1.1 mm, long-tapering, and opening for 1-2 mm at the base. Beak indistinct. Stigma 3, Kachite vestigial.

Fruit: Achenes 3-angled, 2-2.4 x 0.8-1 mm; style exserted 0.2-1.3 mm beyond the beak. Identifiable late May to early September.

Identification Tips: The small number of flowers per plant is a good diagnostic feature. *C. proserpina* and *C. ripens* have shorter perigynia (3-4.5 mm long) that are not opening at the base, and are high montane or alpine plants that do not grow in sphagnum bogs.

Range: Throughout northern Eurasia, much of Canada, WA, MT, and the northeastern U.S.

Habitat/Ecology: Wet acidic environments at low to middle elevations, including sphagnum bogs and acidic peats; usually an open mat, but also in partial shade. Elevations in WA: 150-2300 m (250-4500 ft.). Associates include western hemlock (*Tsuga heterophylla*), lodgepole pine (*Pinus contorta*), alpine spruce (*Pinus murrayana*), long-leaved oak (*Quercus grisea*), cottongrass (*Eriophorum chinquapin*), small cranberry (*Vaccinium oxycoccos*), mountain garden (*Diandra reticulata*), sedge (*Carex* spp.), rushes (*Juncus* spp.), white sedge (*Rhynchospora alba*), and sphagnum moss.

Comments: Threats include camouflage and trampling from recreational use. This species may be extirpated from CT, and is new in PA, WV, the Yukon, Alberta, Saskatchewan, Manitoba, and Prince Edward Island.

References: Flora of North America 1993+, vol. 23.



Illustration: David R. Hunt, © 1987 University of Washington Press



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Rare Plant Species

Climate Change Vulnerability of Rare Plant Species

- <https://www.dnr.wa.gov/NHPclimate-species>
- Climate Change Vulnerability Index (CCVI) considers a species' exposure and sensitivity of the species to changes in climate.
- Resulting rank ranges from "Extremely Vulnerable" to "Not Vulnerable – Expected to Increase"

Assessing Species Vulnerability



The aim of NatureServe's Climate Change Vulnerability Index (CCVI) is to provide a means of rapidly distinguishing species likely to be most vulnerable to change, defined as the degree to which a species is susceptible to detrimental change (Young et al. 2012). The index considers two primary components of a species' vulnerability to climate change: exposure to changes in climate and sensitivity of the species to changes in climate.



Endangered Lomatium bradshawii (yellow) is believed to be moderately vulnerable and highly sensitive to climate change (photo: DNR).

The CCVI scores a species on 17 factors related to its anticipated vulnerability to climate change, such as dispersal ability and habitat specificity. Vulnerability incorporates a species' sensitivity, exposure, and adaptive capacity (Dawson et al. 2011). Four factors addressing indirect exposure to climate change, such as presence in areas likely to be affected by rising sea levels are also evaluated. When available, documented responses to climate change (from prior field and/or modeling studies) are also included. The outcome is one of six possible index categories: three degrees of "Vulnerable" (Extremely, Highly, Moderately), two degrees of "Not Vulnerable" (Presumed Stable, Increase Likely), and "Insufficient Evidence". The Index also provides a report on the key factors that have contributed to the ranking, which can help inform conservation actions.

The results are summarized in the table, below, and reports are available for each of the species. Additional species will be added as assessments are completed for them. Species are listed alphabetically by scientific name.

Rare & High Quality Ecosystems

U.S. National Vegetation Classification (USNVC)

- Overview - <https://www.dnr.wa.gov/NHP-USNVC>
- Descriptions
 - <https://explorer.natureserve.org/>

NatureServe EXPLORER

Search About the Data About Us Help [Adopt a Species](#)

English

Association
Quercus garryana / *Carex inops* ssp. *inops* - *Camassia quamash* Woodland New Search

Translated Name: Oregon White Oak / Long-stem Sedge - Small Camas Woodland

GX GH GH **GH** Critically Imperiled G2 G3 G4 G5 NR Rank

Threatened Endemic Endangered Imperiled Vulnerable Aggravated Stable

Unique Identifier: CEGL00054

Summary

This woodland association occurs in western Washington around the Puget Sound area, and the description provided here is compiled from known occurrences in this area. It is found from 45 to 427 m (150 to 1400 feet) elevation on slopes with more uppers (southeast to west). Slope steepness is variable (0-62% slope, mean 21%), and sites include shallow soils over rock outcrops, bedrock, or on deep-soil, coarse-textured, gravelly outwash plains. These are dry to very dry sites that appear to be relatively nitrogen-rich. Toppositions include mid, upper and ridge-top slopes. This association includes woodlands or forests dominated by *Quercus garryana*. The understorey is dominated by herbaceous vegetation; most commonly *Carex inops* ssp. *inops* and the non-native *Poa pratensis* are codominant. *Elymus glaucus* is usually present and often codominant as well. *Festuca subsericea* ssp. *occidentis*, *Festuca calva*, *Dactylis glomerata*, and *Agrostis capillaris* can also be prominent to codominant. A relatively low-growing shrub layer varies from absent to prominent. *Symphoricarpos albus* var. *irregularis*, *Malva aquilifolia*, *Cypripedium*, and *Ambrosia artemisiifolia* are usually present. A variety of native and non-native forbs can be present. The most abundant native forb in terms of cover is *Camassia quamash*, though it is not consistently present. *Achillea millefolium* var. *occidentale*, *Ranunculus occidentalis* var. *occidentalis*, and *Galium aparine* are usually present. The diagnostic characteristics of this woodland (tree cover >25%) include dominance by *Quercus garryana* with an herbaceous-dominated understorey and significant native understorey component. *Carex inops* ssp. *inops* and the non-native *Poa pratensis* are codominant. *Elymus glaucus* is usually present.

Type Description

Wetland: No
 Boreal: No
 Vegetation

Floristics Summary

This information is compiled from the known occurrences in Washington; additional data from British Columbia needs to be incorporated. This association includes woodlands or forests dominated by *Quercus garryana*. The understorey is dominated by herbaceous vegetation; most commonly *Carex inops* ssp. *inops* and the non-native *Poa pratensis* are codominant. *Elymus glaucus* is

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Natural Areas Preserves & Natural Resources Conservation Areas

- NAPs & NRCAs protect exemplary examples of Washington's biodiversity
 - DNR Natural Areas Program - <https://www.dnr.wa.gov/managed-lands/natural-areas>
 - Wetlands of High Conservation map viewer - <https://www.dnr.wa.gov/NHPwetlandviewer>
- Purpose of NAPs & NRCAs
 - Biodiversity conservation
 - Research / reference benchmarks
 - Education
 - Living museums of Washington's natural heritage



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1. Are there rare species and/or rare & high-quality ecosystems in your jurisdiction?
2. How to avoid loss and/or impacts to those rare elements?

Poll



?

How could DNR-Natural Heritage Program help you utilize our data to designate critical areas?

Q&A

TYPE YOUR QUESTIONS IN THE Q&A BOX IN YOUR TOOLBAR



Thank you!

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