Critical Areas Maps

Local planners should utilize the following resources to ensure that all mapped critical areas are protected and assessed. Regional data sources should be supplemented with local data where available.

Priority Habitats and Species (Washington Department of Fish and Wildlife)

PHS maps draw data from many WDFW databases to provide points and polygons of known locations of several priority habitats and priority species. PHS identifies "priority areas" for priority species—places that warrant special consideration when land use actions are taken. PHS spatial information is available via the PHS on the Web map app: https://geodataservices.wdfw.wa.gov/hp/phs/

Geologic Information Portal (Washington Department of Natural Resources)

Maps of landslide, seismic, volcanic, tsunami, and other geologic hazards that should be considered in land use planning. The geologic information portal can be accessed at: https://www.dnr.wa.gov/geologyportal

Natural Heritage Program (Washington Department of Natural Resources)

Database and maps of rare species and high quality ecological communities that should be considered in land use planning, including wetlands of high conservation value. The data and maps can be accessed at: *https://www.dnr.wa.gov/NHPdata*

Source Water Protection Map (Washington Department of Health)

Map of drinking water source protection areas and known contaminant locations. Planners should use this information to protect their water sources from potentially damaging land use activities. The map can be accessed at: *https://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/SourceWater/GISMappingTool*

Flood Hazard Maps (Federal Emergency Management Agency)

FEMA manages data and maps that can be used to assess flood hazards and prevent incompatible development within floodplains. These tools can be accessed at: https://www.fema.gov/flood-maps

National Hydrography Dataset (U.S. Geological Survey)

Nationwide map of water features such as streams, lakes, ponds, and coastlines. Data quality varies by location and work is underway to improve accuracy within parts of Washington State. The data can be accessed at: https://www.usgs.gov/core-science-systems/ngp/national-hydrography/national-hydrography-dataset?qt-science_support_page_related_con=0#qt-science_support_page_related_con

National Wetlands Inventory (U.S. Fish and Wildlife Service)

Nationwide map of wetlands. Data quality varies by location and work is underway to improve accuracy within parts of Washington State. The data can be accessed at: https://fws.gov/wetlands/data/Mapper.html

Shoreline Aquatic Data (Washington Department of Natural Resources)

Map of eelgrass and other important shoreline seagrass species with monitoring information. The map can be accessed at: *https://wadnr.maps.arcgis.com/apps/webappviewer/index.html?id=83b8389234454abc8725827b49272a31*

Coastal Atlas (Washington Department of Ecology)

Map of shoreline planning information from various sources. Layers include shoreline vegetation, estuaries, sea level rise, shoreline modifications, slope stability, flood hazards, important habitats, and more. The map can be accessed at: https://apps.ecology.wa.gov/coastalatlas/tools/Map.aspx

Vital Signs Puget Sound Recovery Maps (Puget Sound Partnership)

Maps and monitoring information for the Vital Signs, a set of ecosystem health measures that guide the assessment of progress toward Puget Sound recovery goals. These are ecological assessment maps (as opposed to regulatory maps), and include floodplains, shoreline armoring, habitats along the shoreline, freshwater riparian, and others. More information can be found at: https://psp.wa.gov/evaluating-vital-signs.php

Land Use and Land Cover Maps

Puget Sound Mapping Project Land Use Maps (Washington Department of Commerce)

Maps of proposed land use (zoning and comprehensive planning information) standardized across jurisdictions to facilitate regional planning. Planners can use the maps to monitor critical areas and land cover protection by land use designation and plan for future zoning changes. The maps can be accessed at: https://www.commerce.wa.gov/serving-communities/growth-management/puget-sound-mapping-project/

Puget Sound Mapping Project Housing Growth Maps (Washington Department of Commerce)

Maps of housing growth across the Puget Sound region. Planners can use the maps to assess development pressure around important critical areas and plan for where to allocate future development. The maps can be accessed at: https://www.commerce.wa.gov/serving-communities/growth-management/puget-sound-mapping-project/

High Resolution Land Cover (Washington Department of Fish and Wildlife)

High resolution maps of land cover in the Puget Sound region, including vegetation cover, impervious surfaces, and surface water. Planners can use the maps to assess and monitor land cover in critical areas. The maps can be accessed at: http://www.pshrcd.com/#/data

High Resolution Change Detection (Washington Department of Fish and Wildlife)

High resolution maps of land cover change in the Puget Sound region. Maps show polygons representing the extent and type of land cover changes across 2 year periods from 2006 to present. Planners can use the maps to assess where land cover change has occurred in or near critical areas for monitoring. Comparing the amount of change within and outside of critical area buffers can show the efficacy of critical areas regulations. Maps can be combined with local permitting information to determine whether changes were in compliance with regulations. The maps can be accessed at: http://www.pshrcd.com/#/data

Watershed Planning

Puget Sound Watershed Characterization (Washington Department of Ecology)

Maps of watershed importance and vulnerability across the Puget Sound region based on characteristics such water flow, water quality, and habitat. Planners can use the maps to monitor land use in sensitive watersheds and select the most appropriate areas for development. Local governments have successfully used PSWC to justify changing buffer requirements to match watershed importance and to decide where to expand Urban Growth Areas (UGAs). The maps can be accessed at: https://ecology.wa.gov/Water-Shorelines/Puget-Sound/Watershed-characterization-project

Hydrologic Condition Index (King County, Washington Department of Ecology)

The Hydrologic Condition Index developed by King County and Ecology is a tool for analyzing and quantifying the cumulative impacts of land use/land cover changes on hydrologic condition and streamflow. King County developed the index to *assess the effectiveness of their Critical Areas Ordinance*. Ecology is calibrating the model for the rest of the Puget Sound, with plans to make it available as a monitoring tool in 2022. More information can be found at: https://apps.ecology.wa.gov/publications/summarypages/1806014.html

Cultural Resources

Washington Information System for Architectural and Archaeological Records Data (DAHP)

The Washington Department of Archaeology and Historic Preservation (DAHP) maintains the Washington Information System for Architectural and Archaeological Records Data (WISAARD), which provides cultural resource information (e.g., historic buildings and objects, landscapes, traditional cultural places). Cultural resources must be protected from development alongside critical areas. WISAARD can be accessed at: https://wisaard.dahp.wa.gov/

Climate Change

Sea Level Rise (National Oceanic and Atmospheric Administration)

NOAA has developed sea level rise maps that show potential coastal flooding, marsh migration, and other land cover changes for various sea level rise scenarios. Planners can use these maps to assess sea level rise threats to development and critical areas. The maps can be found at: https://www.climate.gov/maps-data/dataset/sea-level-rise-map-viewer

Stream Temperature Projections (U.S. Forest Service)

The NorWeSt Stream Temperature interactive map shows historical stream temperature data and projected temperature increases for future scenarios in 2040 and 2080. Planners can use this map to consider future impacts on habitat for species like salmon to help guide protection and restoration. You can access the map at: https://usfs.maps.arcgis.com/apps/webappviewer/index.html?id=bf3ff38068964700a1f278eb9a940dce

Stream Flow Projections (Washington Department of Fish and Wildlife)

WDFW's Culverts and Climate Change web mapping application provides projections of percent change of future bankfull width and future 100-year flood discharge. The tool can be accessed at: https://culverts.wdfw-fish.us

Climate Change Information and Projections (University of Washington)

This page provides information about climate change in the Pacific Northwest: https://cig.uw.edu/learn/climate-change/

Ecosystem Services

inVEST Natural Capital Project (Stanford University)

inVEST provides a set of ecosystem service modeling tools that take in land use/land cover maps and associated data as inputs and use them to generate maps of the most important areas on the landscape for various ecosystem services. Planners can use the models to quantify the benefits of critical areas protection or the ecosystem costs of land conversion. The tools can be accessed at: https://naturalcapitalproject.stanford.edu/software/invest

VELMA Eco-Hydrological Model (Environmental Protection Agency)

The VELMA model can help improve the water quality of streams, rivers, and estuaries by making better use of both natural and engineered green infrastructure (GI). It can help planners assess green infrastructure options and addresses maintenance and longevity of riparian buffers. The model can be accessed at: https://www.epa.gov/water-research/visualizing-ecosystem-land-management-assessments-velma-model-20

i-Tree (U.S. Forest Service)

i-Tree includes a set of tools for calculating ecosystem service benefits of trees at the landscape and site scale. Planners can calculate the benefits of protecting or restoring trees in critical areas. The tools can be accessed at: https://www.itreetools.org/

Statistical Analysis Tools

Sample Size Calculator (Statulator)

Planners can use the calculator to calculate the sample size needed for statistical comparisons. The calculator can be accessed at: http://statulator.com/SampleSize/ss2M.html

Manuals and Guidance Documents

Critical Areas Handbook and Checklist (Washington Department of Commerce)

Commerce provides resources about critical areas requirements under the Growth Management Act, including a Critical Areas Handbook and a Critical Areas Checklist. These resources include information on monitoring and adaptive management.

Wetland Rating Systems and Guidance (Washington Department of Ecology)

Recommendations for wetlands rating systems can be found at:
- 2014 Updates to the Washington State Wetland Rating Systems
- Washington State Wetland Rating System for Western Washington
- Washington State Wetland Rating System for Eastern Washington

For other resources and guidance on protecting wetlands, go to Ecology's Local Wetland Regulations: Growth Management Act technical assistance.

Critical Aquifer Recharge Areas Protection Guidance (Washington Department of Ecology)

The Critical Aquifer Recharge Areas Guidance Document (2005) provides information on protecting functions and values of critical aquifer recharge areas, best available science, how to work with state and local regulations, and adaptive management.

Stormwater Manuals (Washington Department of Ecology)

Ecology's Stormwater Manual for Western Washington (updated in 2012) includes low impact development (LID) related definitions, requirements, and an LID performance standard that can help protect critical areas. See Stormwater Management and Design Manuals on Ecology's web page.

Frequently Flooded Area Guidance (Washington Department of Ecology)

Ecology provides guidance and resources on their web page for developing a frequently flooded areas chapter for local Critical Areas Ordinances.

Geologic Hazards Guidance (Washington Department of Natural Resources)

DNR provides information about geologic hazards and the environment on their web page.

Fish and Wildlife Conservation Areas Guidance (Washington Department of Fish and Wildlife)

WDFW provides guidelines on multiple topics related to conservation of fish and wildlife areas:

- Priority Habitat and Species maps (updated daily)
- Priority Habitats and Species List (updated June 2016)
- Mazama Pocket Gopher (2011, 2016)
- Great Blue Heron (2012)
- Western Gray Squirrel (2010)
- Water Crossing Design Guidelines (2013)
- Stream Habitat Restoration Guidelines (2012)
- Shrub-Steppe (2011)
- Land Use Planning for Salmon, Steelhead and Trout (2011)
- Landscape Planning for Washington's Wildlife (2009)
- Aquatic Habitat Guidelines (2010, 2010, 2014)
- Riparian Management recommendations (1997)
- Riparian Ecosystems, Volume 1: Science Synthesis and Management Implications (2018)

Stream Typing Guidance (Washington Department of Natural Resources)

DNR provides information on using their stream typing system. Planners should use stream typing to determine which regulations apply to streams.

Anadromous Fisheries Conservation Guidance

Planners should consider recommendations found in regional and watershed specific salmon recovery plans (see the Governor's Salmon Recovery Office webpage and the Puget Sound Partnership's Salmon Recovery webpage). Land Use Planning for Salmon, Steelhead and Trout: A land use planner's guide to salmonid habitat protection and recovery (October 2009) is an excellent resource. The Washington State Recreation and Conservation Office (RCO) website includes information on salmon recovery efforts.