

Recommended Protocol for Evaluating Vegetation for Washington State Department of Transportation Projects

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Recommended Protocol for Evaluating Vegetation for Washington State Department of Transportation Projects

This document describes the protocol for evaluating vegetation resources in the project area. It was developed to provide a standard framework for evaluating vegetation during the preparation of environmental review documentation required by the National Environmental Policy Act for Washington State Department of Transportation (WSDOT) projects. The following protocol consists of guidelines for compiling needed information, mapping vegetation, and evaluating the identified vegetation units for the presence of protected plant species. It also provides information on the analyses that should result from the research, mapping, and vegetation assessments. The protocol includes an office-based research phase and a field verification phase.

1 Preliminary Research and In-Office Analysis

Review of Project Description and Determination of Study Area

The project description should discuss the purpose of the project and the need for the project, the project footprint, and the project study area. Typically, the study area includes both the existing right-of-way and any new right-of-way and should extend a minimum of 300 feet outside the boundaries of the project footprint. The study area should also include the extent of any expected impacts beyond the project footprint, such as staging areas.

Review of Available Information

Lists of endangered, threatened, sensitive, and candidate species at either the federal or state level can be obtained from the following:

- Washington Department of Natural Resources Natural Heritage Program
- U.S. Forest Service Survey and Manage and Sensitive Plant Species programs for projects on or adjacent to U.S. Forest Service lands
- Other relevant jurisdictions (e.g., local tribes, National Park Service, and local agencies, etc.).

Species of local importance that may not be listed at the federal or state level should be requested from the appropriate jurisdictional agency in the project vicinity. In addition, a list of noxious weeds for state and local jurisdictions can be obtained from the Washington State Noxious Weed Control Board, the U.S. Forest Service, and local jurisdictions that maintain noxious weeds lists.

After potential plant species in the project study area have been identified, local botanists should be contacted to discuss any specific sightings of endangered, threatened, sensitive, or candidate plant species in or adjacent to the study area and other plant species that are considered locally unique, rare, or of local.

From this species research, a list of plant species that are likely to occur in the study area should be developed. The habitat and life-cycle requirements of each species on the list should be compared to the potential project impacts (such as vegetation clearing) and documented in a

matrix showing the plant species, their habitat requirements, and potential risks to the plant species resulting from the project. These risks might include elimination of a habitat requirement (such as shade), disruption of reproduction cycles, permanent habitat loss, or other factors. As indicated, the matrix should address spatial impacts (such as loss of desirable habitat or isolation of remaining habitat) as well as temporal impacts (such as disturbances during sensitive life-cycle periods). This matrix will provide guidance for assessing the need for and scope of followup field-based plant surveys. For most projects, detailed or specific plant surveys will not be required, unless they are located on national forest lands where they are typically required under the Survey and Manage Program.

Useful websites with additional information for the vegetation discipline report are indicated at the end of this document.

Preparation of Vegetation Base Map

A map of the study area based on geographic information system (GIS) data (including the existing right-of-way, the new right-of-way, and 300 feet on either side of the project footprint boundary) should be created. The map should also show the project impact areas as defined by the project description. The map should show roads and natural features such as lakes, streams, and wetlands. Local jurisdictional boundaries and property boundaries may also be included. As relevant, the GIS information discussed below should be included.

The use of GIS data to evaluate vegetation resources requires an assessment of the most current and accurate data available. These data can be obtained from a variety of sources and can vary in terms of level of completeness, spatial scale, and temporal scale. The appropriate GIS data layers from these sources should be selected for the study area. Most data are available from websites and some will need to be ordered from the respective organization. Not all sources will have available data for the study area, but obtain what is available. Each data layer should be assembled into one or more maps.

Once the maps have been developed, the vegetation types should be classified by means of the same system(s) used for classifying wildlife habitat, and a baseline vegetation map should be developed for the study area based on the habitat types. Maps showing the locations of protected plant species and noxious weeds should be produced for use during field verification; however, maps showing the locations of listed species should not be included in the discipline report.

From this species research, a list of plant species and vegetation types that are likely to occur in the study area should be developed. This list will provide a starting point for identifying species that may be present. However, the actual plant species and vegetation types identified in the study area will dictate the plant species and vegetation types that need to be addressed in the report.

Aerial Photography – Aerial photographs should be used as the basis for delineating vegetation and/or land-use-type polygons. Each vegetation type should be delineated and digitized into polygons that will ultimately be identified and field verified. Each digitized polygon should be specific to a particular vegetation type.

Black and white aerial photographs are available in different formats and spatial resolutions. U.S. Geological Survey (USGS) digital orthophoto quarter quadrangles have an approximate spatial resolution of 1 meter, and coverage includes the entire state of Washington. The dates of these photographs range from 1990 to 1994.

The USGS also has geo-referenced color aerial photographs available for most urban areas in the central Puget Sound. Photographs were taken in June 2002 with a pixel resolution of 1 foot. Often aerial photographs are also available from various local sources. For example, aerial photographs are available from the City of Seattle, Bainbridge Island, Snohomish County, and Yakima County. Other resources include the WSDOT GIS library, university digital maps and data, and historical archives.

USGS Topographic Quadrangles – USGS 7.5-minute topographic quadrangles should be used as a base map to check aerial imagery features, vegetation extents, and in some cases landscape changes. USGS has digital topographic quadrangles available as a digital raster graphic (DRG) files. The DRG maintains the horizontal precision of the 7.5-minute source map that meets National Map Accuracy Standards (NMAS), and the scanned raster image is available in GeoTIFF format.

Land Use and Land Cover – If available, land use and land cover data can be used to identify different vegetation and land use zones as a basis for delineating discrete vegetation types. Zoning or comprehensive plan layers are available from certain counties and may also be used; of particular relevance are sensitive and critical areas maps. Land cover data compiled from Landsat satellite flights in 1998 are available for the Puget Sound region from the University of Washington Libraries aerial photograph collection. Outside the Puget Sound area, individual counties need to be contacted to determine the availability of land use and land cover data.

National Wetlands Inventory – The U.S. Fish and Wildlife Service has mapped wetland features and stored them as GIS shapefiles corresponding to a single 1:24,000-scale USGS quadrangle. Data have been mapped from 1977 to the present. National Wetlands Inventory data should be used to identify and map wetland vegetation types and may provide information about habitats for listed plant species. Many jurisdictions also have wetland inventories that may provide more detailed and accurate wetland information.

Soils – The Natural Resources Conservation Service has produced the comprehensive Soil Survey Geographic (SSURGO) database that should be used to assess the types of soils in the study area. Soil type is a critical variable that may determine the types of plant species that are present. SSURGO is a digital soil survey that was prepared by digitizing detailed soil maps. It includes the most detailed level of soil geographic data developed by the National Cooperative Soil Survey. If the project is in a forested area, forest soils in Washington are available through the Private Forest Land Grading system.

Priority Habitat and Species – Digital priority habitat data are available through the Washington Department of Fish and Wildlife. *Priority habitats* are habitat types or elements with unique or significant value to a diverse assemblage of species (e.g., old-growth/mature forests and estuaries). A priority habitat may consist of a unique vegetation type or dominant plant species, a described successional stage, or a specific structural element. Priority Habitats and Species

data were compiled on 1:24,000-scale USGS 7.5-minute topographic maps and contain shapefile polygons of fish and wildlife resources based on research and field surveys conducted over the past 30 years. Any priority habitats and species included the data for the study area should be added to the compiled GIS data.

Washington Gap Analysis – Washington Gap Analysis GIS range maps represent a detailed analysis of the conservation status of land cover in the state. Vegetation was mapped from 1991 satellite Thematic Mapper imagery and other records using the National Vegetation Classification System (FGDC 1997). These data are combined and displayed at a cartographic scale of 1:100,000.

Washington Natural Heritage Program – The Washington Natural Heritage Program is a GIS data set available through the Washington Department of Natural Resources. It contains the most authoritative information available for rare plant species populations and endangered ecosystems in Washington and should be used to identify sensitive habitat types in the study area. The data were digitized at the 1:24,000 scale from field reports of scientists who have hand-mapped the inventory locations.

Local Vegetation and Habitat Inventories – Local data from sources such as the city; the county; the U.S. Forest Service; local, state and federal park services; the Washington Department of Natural Resources; or a local survey would add a finer level of detail to the list of vegetation classifications and plant species that may be found in the study area. Local vegetation inventories may provide information on important habitats within a jurisdiction and allow an assessment of the relative rarity or importance of a particular plant species.

Identification of Vegetation Unit Polygons

Vegetation units should be identified by classifying vegetation types within the study area using aerial photographs. The method for classifying vegetation communities (described in the following section) uses the same classification system as that used for classifying wildlife habitat. With this method, polygons are drawn around each vegetation community type (e.g., mature conifer forest, shrub habitat, or grassland), corresponding with identifiable vegetation breaks. Each polygon represents a separate habitat unit with attributes indicating the vegetation type.

Additional base data layers identified in the previous section should be added as these data are available. Priority Habitats and Species and Washington Natural Heritage Program data that fall within the study area indicate high-quality or rare habitat types, and they need to be identified because they directly increase the value of the habitat unit with which they intersect.

Classification of Habitats

Vegetation units should be classified according to the habitat classification categories defined in *Natural Vegetation of Oregon and Washington* (Franklin and Dyrness 1988) and *Wildlife-Habitat Relationships in Oregon and Washington* (Johnson and O’Neil 2001). The former provides categories based on the dominant plant species present. The latter provides information on overall structural features and general plant types, as well as some information on potential

wildlife usage. In combination, both structural and plant association information is included in vegetation assessments. If appropriate, vegetation units can be refined based on local inventories or other organized mapping projects.

If the project is located in an area covered by the U.S. Forest Service Forest Plan, vegetation units (habitats) defined in the Forest Plan that are appropriate for the study area should be reviewed to determine whether those categories should be applied instead of the two classification systems described above.

Development of Plant Species List

A plant species list should be developed using the lists assembled during the preliminary research phase. In addition, the vegetative habitat categories and associated plant species presented in *Natural Vegetation of Oregon and Washington* (Franklin and Dyrness 1988) and *Wildlife-Habitat Relationships in Oregon and Washington* (Johnson and O'Neil 2001) should be used to determine the vegetation community plant associations.

2 Field Verification of Habitat Types

After the preliminary research and delineation of vegetation units and the characterization and mapping of vegetation units based on habitat units, the vegetation units should be field verified to confirm or revise the vegetation unit categories and to check the spatial accuracy.

Vegetation Assessment

The results of the vegetation assessment are intended to provide a qualitative value for the habitat potential of each habitat unit. The vegetation assessment should include information related to the rarity and importance of the vegetation type, special habitat features, and connectivity with other habitats. This information should be used to document the potential effects of proposed actions on vegetation resources.

Particular habitat features often are critical in supporting protected plant species at particular stages of their life history. A list of habitat features specific to the project vicinity should be consulted and the presence of any of these features should be tallied during the field assessments. This list should be generated by a review and analysis of the species list and the matrix of species requirements and potential project-related risks that was developed for the project. Special habitat features for protected plants should be recorded, such as hydrologic regime, sun exposure, soil properties, and presence of associated plants. The presence of particular habitat features indicates the potential for supporting a particular plant species. This synthesis requires knowledge of habitat features important for various plant species and should be included in the matrix of species requirements and potential project-related risks.

Vegetation habitat quality is also dependent on the connectivity between vegetation habitat units. These connections provide seed sources, reproduction capability, and protection from development or other impacts. Elements to be evaluated include the types of connected habitats, degree of connectivity, and types of habitats for which connectivity has been demonstrated to benefit protected plant species. This evaluation should be conducted using a combination of

preliminary research (e.g., GIS, aerial photographs, and contacts with agency biologists) and field verification of connectivity.

The mapped vegetation units should be overlain by the project impact areas to establish the effects of the project on vegetative habitat. The overlay should include the calculated area of permanent and temporary construction disturbance and any detrimental effects on the quality of habitats in specific vegetation units. The potential effects of disruption or isolation of a portion of a vegetation unit should be evaluated on the basis of the project setting and the plant species that are associated with that setting or potentially adversely affected by the proposed project.

Photographic Documentation

Digital photographs of representative vegetation habitat units should be taken. Habitat where protected species and noxious weeds were found or where protected plant species could occur should also be photographed.

3 Detailed Vegetation Surveys

The risk matrix and vegetation assessment will provide a general idea of the plant species and associations that are likely to occur in the study area. If documented protected plant species are present, a species-specific or detailed plant survey may be necessary to confirm their presence or absence. The need for and scope of the survey would be determined by the analysis of the potential species list and matrix, the vegetation unit mapping, and the potential project impacts.

4 Website Information Sources

The following online sources may provide useful information:

- Landsat land cover analysis
<http://depts.washington.edu/cwvs/Research/Projects/landsat.html>
- National Wetlands Inventory
<http://www.fws.gov/nwi/>
- Natural Resources Conservation Service soils maps
http://www.or.nrcs.usda.gov/pnw_soil/mol_templates.html.
- Northwest Habitat Institute
<http://www.nwhi.org/>
- Soil Survey Geographic (SSURGO) database
<http://www.soils.usda.gov/survey/geography/ssurgo/>
- University of Washington Libraries aerial photograph collection
<http://geo.lib.washington.edu/website/aerials/viewer.htm>
- U.S. Fish and Wildlife Service listed species
<http://www.fws.gov/westwafwo/speciesmap.html>

- Washington Department of Fish and Wildlife Priority Habitat and Species list
<http://wdfw.wa.gov/hab/phslist.htm>.
- Washington Department of Natural Resources Natural Heritage Program
<http://www.dnr.wa.gov/nhp/refdesk/index.html>
- Washington Department of Natural Resources plant list
<http://www.dnr.wa.gov/nhp/contact/order.html>.
- Washington Gap Analysis
<http://198.238.33.67/wlm/gap/dataproduct.htm>
- Washington State Noxious Weed Control Board noxious weeds list
http://www.nwcb.wa.gov/weed_list/weed_list.htm.

References

- FGDC. 1997. National Vegetation Classification System. FGDC-STD-005. Federal Geographic Data Committee, Vegetation Subcommittee. June 1997.
- Franklin, J.F. and C.T. Dyrness. 1988. Natural Vegetation of Oregon and Washington. Oregon State University Press, Corvallis, Oregon.
- Johnson, D.H. and T. A. O'Neil. 2001. Wildlife-Habitat Relationships in Oregon and Washington. Oregon State University Press, Corvallis, Oregon.