

NATIONAL WETLAND INVENTORY

NOTES TO USERS

EAST PUGET SOUND

1:100,000 SCALE MAPS COVERED

Concrete NW (Mount Baker)
Concrete SW (Sauk River)
Wenatchee NW (Skykomish River)

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East Puget Sound, Washington

INTRODUCTION

The U.S. Fish and Wildlife Service, Office of Habitat Resources, is conducting an inventory of the wetlands of the United States. The National Wetlands Inventory (NWI) is establishing a wetland data base in both map and computer forms for the entire country. The NWI information will serve to identify the current status of U.S. wetlands and can be used as a reference point from which future changes in wetlands can be evaluated.

1. PURPOSE

The purpose of Notes to Users is to provide general information regarding the production of National Wetlands Inventory (NWI) maps and wetlands found within a relatively similar geographic area. Notes to Users are not intended to include descriptions of all wetlands found in the area nor provide complete plant species information.

2. AREA COVERED

The area covered is defined by the Mount Baker, Sauk River, and Skykomish River USGS 1:100,000 intermediate scale maps (see attached index maps). According to Bailey's ecoregions, the study area is in the Humid Temperate Domain, Marine Division, Silver Fir-Douglas Fir Province.

This mostly montaine area is characterized by generally accordant ridge crests separated by deeply dissected river valleys. The major river valleys in the study area are the Snoqualmie, Skykomish, Skagit, Sauk, and Baker. Glacial deposits have been widely distributed throughout the area, the majority concentrated in the valleys of major rivers.

These mountain masses have a profound effect on the climatic regime. The Cascade Mountains are an important barrier to the movement of maritime and continental air masses. Elevation has a primary effect upon local climate. Precipitation and snowfall increase and temperatures decrease rapidly with increasing elevation on both western and eastern slopes of the range.

The principal trees of this densely forested region are western cedar, silver fir, western hemlock, and Douglas-fir. The high snowcapped mountains have a well marked subalpine belt. Important trees here are the mountain hemlock, subalpine fir and whitebark pine. The alpine zone has a rich flora of shrubs and herbs.

Soils of the mountains are generally at least moderately deep,

well drained sandy loams to clay loams on moderate slopes. Steeper slopes more commonly have shallow stony soils formed from volcanic ash and colluvium. Valley soils were formed from glacial outwash, alluvium and lacustrine deposits.

3. MAP PREPARATION

Wetland classification for the NWI maps is in accordance with "Classification of Wetlands and Deep-Water Habitats of the United States (An Operational Draft)," Cowardin, et al, 1977.^{1/}

Wetland classification and delineations were produced by air photointerpretation of high level aerial photography. The following aerial photography was used:

<u>MAP</u>	<u>SCALE</u>	<u>FILM</u>	<u>DATE</u>
Mount Baker	1:80,000	Black & White	9/74, 8/74
Sauk River	1:80,000	Black & White	9/75, 8/74, 9/74
Skykomish R.	1:120,000	Black & White	7/73
	1:130,000	Color infrared	12/73, 12/81

Stereoscopically reviewed aerial photographs had wetland boundaries and labels delineated on the photographs. Delineations were enlarged to a scale of 1:24,000 using a zoom-transfer scope and fitted to USGS 7 1/2 minute topographic maps. Large scale NWI wetland maps (1:24,000 scale) are available for the USGS 7 1/2 minute topographic sheets indicated on the attached index map.

The Project Officer for production of the wetland maps was Dennis Peters, Regional Wetlands Coordinator, U. S. Fish and Wildlife Service, Region 1, Lloyd 500 Building, 500 NE Multnomah Street, Portland, Oregon 97232, telephone (503) 231-6154. Aerial photo interpretation was completed by Area Information Systems (AIS), Crestline, California. Maps were prepared by Martel Laboratories, Inc., and the NWI National Team in St. Petersburg, Florida.

^{1/}The classification system was published in 1979: Cowardin, Lewis M., Virginia Carter, Francis C. Golet, and Edward T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States, Fish and Wildlife Service, U. S. Department of the Interior, Washington, DC, December 1979.

4. USER CAUTION

The map documents were prepared primarily by stereoscopic analysis of high altitude aerial photographs. Wetlands were identified on the photographs based on vegetation, visible hydrology, and geography. The aerial photographs typically reflected conditions during the specific year and season when they were taken. In addition, there is a margin of error inherent in the use of aerial photographs. Thus a detailed on-the-ground and historical analysis of a single site may result in revision of the wetland boundaries established through photographic interpretation. In addition, some small wetlands and those obscured by dense forest cover may not be included in the map document.

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define limits of proprietary jurisdiction of any federal, state, or local government or to establish the geographical scope of regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specific agency regulatory programs and proprietary jurisdictions that may affect such activities.

5. WETLAND COMMUNITIES AND DEEPWATER HABITATS

This discussion is a general overview of wetlands and deepwater habitats in the study area as mapped by the NWI. It is not a complete list of NWI mapping codes nor does it contain a complete vegetation list, but rather reflects general wetland plant communities observed during field reconnaissance.

Wetlands in the subject area fall within the Lacustrine, Riverine, and Palustrine systems. Deepwater habitats are areas that are permanently flooded (except during periods of extreme drought) and are characterized by open water on the aerial photography. These habitats are also present in the Riverine system (R2OW, R3OW), and Lacustrine system (L1OW).

Aquatic beds (AB) in the Lacustrine and Riverine systems are considered deepwater habitats and as with Palustrine aquatic bed (PAB) commonly include species such as pond lily (Nuphar spp.), pond weeds (Potamogeton spp.) or duck weeds (Lemna spp.). Unvegetated wetlands, present in all systems, include the classes beach/bar (BB) and flats (FL).

Natural or artificial basins or catchments larger than 20 acres are in the Lacustrine system. The Lacustrine system on the NWI maps includes the classes Lacustrine open water (L1OW, L2OW) and Lacustrine flat (L2FL). The open water areas are covered by water whereas the flats are exposed at some time during the year. Basins or catchments smaller than 20 acres are in the palustrine system and classified as Palustrine open water (POW) or Palustrine flat (PFL) if exposed at some time during the year.

The Riverine system includes the classes open water and flats. Open water and flats are restricted to the Riverine lower (R2OW) and upper (R3OW) perennial subsystems. While the flats are not covered by a perennial flow, they are associated with the reach of the river that contains permanent water and are included in the perennial subsystems. In cases where narrow bands of streamside palustrine wetland cannot be separately delineated from the riverine system, the wetlands are mapped as linear palustrine wetland features. Streams which do not flow year round are classified as intermittent stream beds (R4SB).

The majority of wetlands within the study area are within the Palustrine system and represented by the classes emergent (EM), scrub shrub (SS), and forest (FO).

Palustrine emergent wetlands (PEM) are characterized by numerous and various species; some of the most common being bulrush (Scirpus spp.), sedges (Carex spp.), horsetails (Equisetum spp.), Rushes (Juncus spp.), spike rushes (Eleocharis spp.), cattail (Typha spp.), dock (Rumex spp.), smartweeds (Polygonum spp.), and reed canary grass (Phalaris arundinacea).

Palustrine forested (PFO) and scrub shrub (PSS) wetlands are characterized by woody species. Common shrub species include willow (Salix spp.), red alder (Alnus rubra), hardhack (Spiraea douglassi) and cascara (Rhamnus purshiana). Typical forest species are red alder, Oregon ash (Fraxinus latifolia), big leaf maple (Acer macrophyllum), western red cedar (Thuja plicata) and black cottonwood (Populus trichocarpa). The classification of forested or scrub/shrub wetlands is determined by height of woody vegetation - forested greater than 6 m. and scrub/shrub less than 6m.

Modifiers

Hydrologic characteristics are an important aspect of wetlands. The water regime modifiers describe in general terms the duration and timing of surface inundation, as well as groundwater fluctuations. Mapping codes for these modifiers are indicated in parentheses in the discussion that follows.

For the purpose of mapping, water regime modifiers have been lumped into three broad categories. These are:

Intermittently flooded-temporarily flooded (W). The substrate is usually exposed, but surface water is present for variable periods without detectable seasonal periodicity, or surface water is present for brief periods during the growing season.

Saturated/Seasonally-flooded/Semipermanently flooded (Y). The substrate is saturated to the surface for extended periods during the growing season, or surface water is present for extended periods especially early in the growing season but is absent by the end of the season in most years, or surface water persists throughout the growing season in most years.

Intermittently exposed/Permanently flooded (Z). Surface water is present throughout the year except in years of extreme drought, or water covers the land surface throughout the year in all years.

An artificially flooded (K) water regime modifier can be applied with all water regime modifiers. In this case, flooding is under the direct and purposeful control of man. Special modifiers included on these NWI maps, where applicable, are:

Diked/impounded (h). Created or modified by a barrier, dike, or dam which obstructs the inflow or outflow of water.

Excavated (x). Lies within a basin or channel excavated by man.

6. SOURCES OF ADDITIONAL INFORMATION

Since the purpose of the Notes to Users is to provide a general overview of a relatively large geographic area, it is important to be aware of sources of additional information. The following is a list of reports providing information about the area of concern.

Bailey, Robert G. 1978. Description of the ecoregions of the United States. U. S. Forest Service, USDA, Ogden, Utah.

Booz Allen Energy and Environment Division. The Natural Resource Benefits of Freshwater Riverine Wetlands: A Literature Review, prepared for Davis G. Davis Office of Analysis and Evaluation, 1978.

Cowardin, Lewis M., Virginia Carter, Francis C. Golet, and Edward T. LaRoe. 1977. Classification of wetlands and deep-water habitats of the United States (An Operational Draft), U. S. Fish and Wildlife Service, October 1977.

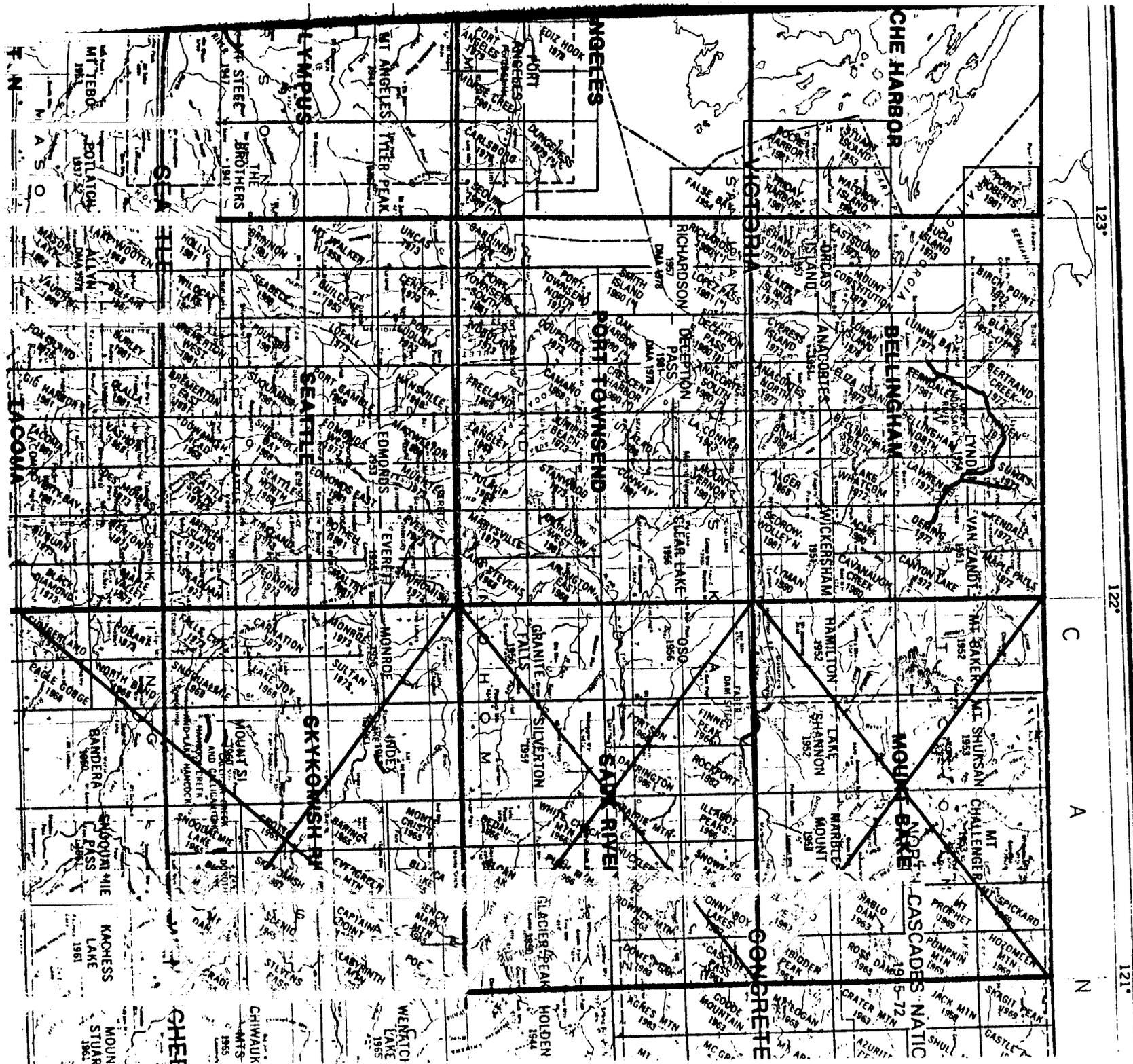
King County Planning Division. 1982. Wetland Plants of King County and the Puget Sound Lowlands. King County Planning Division, Seattle, Washington.

Kozloff, Eugene N. Plants and Animals of the Pacific Northwest. University of Washington Press, Seattle, Washington. 1976.

Steward, Albert N., LaRea J. Dennis and Helen M. Gilkey. Aquatic Plants of the Pacific Northwest. Oregon State University Press, Corvallis, Oregon. 1963.

SUMMARY OF NWI CODES

NWI CODE	NWI DESCRIPTION	COMMON DESCRIPTION	VEGETATION/SUBSTRATE
L1OW	Lacustrine lentic open water	lake	open water
L2OW	Lacustrine littoral open water	shallow lake	open water
L2AB	Lacustrine aquatic bed	pond weeds	duck weed (<u>Lemna</u> spp.) pond weed (<u>Potamogeton</u> spp.)
L2FL	Lacustrine flat	lake flat	unvegetated sand, mud, gravel
R2OW	Riverine lower perennial	river, stream	open water, low gradient
R3OW	Riverine upper perennial	river, stream	open water, high gradient
R2FL	Riverine flat	river bar	unvegetated sand, mud, gravel
R4SB	Riverine intermittent stream	intermittent stream	unvegetated sand, mud, gravel
POW	Palustrine open water	pond, dug out	open water
PAB	Palustrine aquatic bed	pond weed	duck weed (<u>Lemna</u> spp.) pond weed (<u>Potamogeton</u> spp.)
PEM	Palustrine emergent	marsh, wet meadow	sedge (<u>Carex</u> spp.) rush (<u>Juncus</u> spp.) cattail (<u>Typha</u> spp.) reed grass (<u>Phalaris</u> spp.) smartweed (<u>Polygonum</u> spp.)
PSS	Palustrine scrub shrub	shrub swamp	willow (<u>Salix</u> spp.) red alder (<u>Alnus rubra</u>) hardhack (<u>Spirea douglasii</u>)
PFO	Palustrine forest	swamp, bottom land	ash (<u>Fraxinus latifolia</u>) cottonwood (<u>Populus trichocarpa</u>) maple (<u>Acer macrophyllum</u>) red cedar (<u>Thuja plicata</u>) red alder (<u>Alnus rubra</u>)



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