



United States Department of the Interior

FISH AND WILDLIFE SERVICE

LLOYD 500 BUILDING, SUITE 1692

500 N.E. MULTNOMAH STREET

PORTLAND, OREGON 97232



B

(503) 231-6154 FTS:429-6154

NATIONAL WETLAND INVENTORY

NOTES TO USERS

SOUTHWEST COASTAL WASHINGTON AND WILLAPA HILLS

1:100,000 SCALE MAPS COVERED

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Hoquiam NW (Chehalis River)

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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.

I. PURPOSE

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

2. AREA COVERED

The area covered is defined by the Chehalis River and Westport 1:100,000 intermediate scale maps (see attached index maps). According to Bailey's ecoregions, the area is in the Humid Temperate Domain, Marine Division, Pacific Forest Province.

The area is dominated by a section of the Coastal Range mountains known as the Willapa Hills. These steep, rugged hills are dissected by two major river systems; the Willapa river which flows into Willapa Bay and the Chehalis River which flows into Grays Harbor. Willapa Bay and Gray's Harbor are the largest and most important estuaries on Washington's west coast.

Because this area fronts the Pacific Ocean, its climate is characterized by generally mild temperatures averaging 35° to 50° F (2° to 10°C) throughout the year. Rainfall is heavy, 40 to 100 in. per year with maximum rainfall in winter. Humidity is always high producing an favorable precipitation/ evaporation ratio.

The principal trees of this densely forested region are western cedar, western hemlock, and sitka spruce along the coast with Douglas-fir replacing spruce farther in land. Numerous species of shrubs, many of them ericacious, grow exceptionally well, often creating an impenetrable understory.

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. Typical soils on the narrow coastal plain are moderately well drained to poorly drained entisols and inceptisols.

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 aerial photography used was color infrared at a scale of 1:58,000 taken in August of 1981.

Limited field reconnaissance was conducted during the fall and winter of 1982.

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. The 1:100,000 scale wetland maps were prepared from the 7 1/2 minute series. 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 Martel Laboratories in St. Petersburg, Florida. 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.

All five wetland systems, Marine, Estuarine, Lacustrine, Riverine, and Palustrine are represented in the subject area. 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 present in the Marine system (M1OW), Estuarine system (E1OW), Riverine system (R1OW, R2OW), Lacustrine system (L1OW) and Palustrine system (POW).

Aquatic beds (AB) present in the Marine and Estuarine systems are composed of eel grass beds (Zostera spp.) or algal mats (Ulva spp.) Aquatic beds in the Lacustrine, Riverine, and Palustrine system commonly include species such as pond lily (Nuphar spp.), pond weeds (Potamogeton spp.), duck weeds (Lemna spp.), or millfoil (Myriophyllum).

Unvegetated wetlands, present in all systems, include the classes rocky shore (RS), beach/bar (BB) and flats (FL).

Emergent wetlands (persistent) are present in the Estuarine and Palustrine system. Estuarine intertidal emergent wetlands (E2EM) are often referred to as salt marshes. The dominant plant species characterizing these communities are pickleweed or glass worts (Salicornia spp.), saltgrass (Distichlis spicata), cordgrass (Spartina spp.), jaumea (Jaumea spp.), hairgrass (Deschampsia spp.), saltmarsh aster (Aster spp.), pacific silverweed (Potentilla spp.) and lyngby's sedge (Carex lyngbeii).

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

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 (Spirea douglassii), cascara (Rhamnus purshiana), and salmon berry (Rubus spectabilis). Typical forest species are red alder, Oregon ash (Fraxinus latifolia), big leaf maple (Acer macrophyllum), sitka spruce (Picea sitchensis), western red cedar (Thuja plicata), lodgepole pine (Pinus contorta) 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.

Cranberry bogs (Vaccinium oxycoccus) which are managed for commercial harvest are classified as farmed wetlands (Pf).

The Riverine system includes the classes open water and flats. Open water and flats are restricted to the Riverine tidal (R1), lower (R2) and upper (R3) 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 streamside palustrine wetland vegetation cannot be separately delineated from the riverine system, the wetlands are mapped as linear palustrine wetland features.

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.

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.

The small-scale (1:00,000) NWI maps' legends do not include water regime nor special modifiers. Mapping codes for these modifiers are indicated in parentheses in the discussion that follows. These modifiers are grouped under two major headings: Tidal and Nontidal.

Tidal

Subtidal (L). The substrate is permanently flooded with tidal water.

Irregularly Exposed (M). The land surface is exposed by tides less often than daily.

Regularly Flooded (N). Tidal water alternately floods and exposes the land surface at least once daily.

Irregularly Flooded (P). Tidal water floods the land surface less often than daily.

In Tidal Riverine, Lacustrine, and Palustrine areas, a nontidal modifier is used with a tidal suffix to describe the water regime more appropriately: Temporarily Flooded-Tidal (S), Seasonally Flooded-Tidal (R), Semipermanently Flooded-Tidal (T), or Permanently Flooded-Tidal (V).

Nontidal

For the purpose of mapping, nontidal 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 1:100,000 scale 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.

U.S. Army Corps of Engineers, Seattle District, 1980. Grays Harbor and Chehalis River Improvements to Navigation Environmental Studies.

U.S. Fish and Wildlife Service. 1981. Willapa Bay : A
Historical Perspective and a Rational for Research. U.S.
Department of Interior FWS/OBS-81/03 April. 52pp.

SUMMARY OF WETLANDS AND DEEPWATER HABITATS

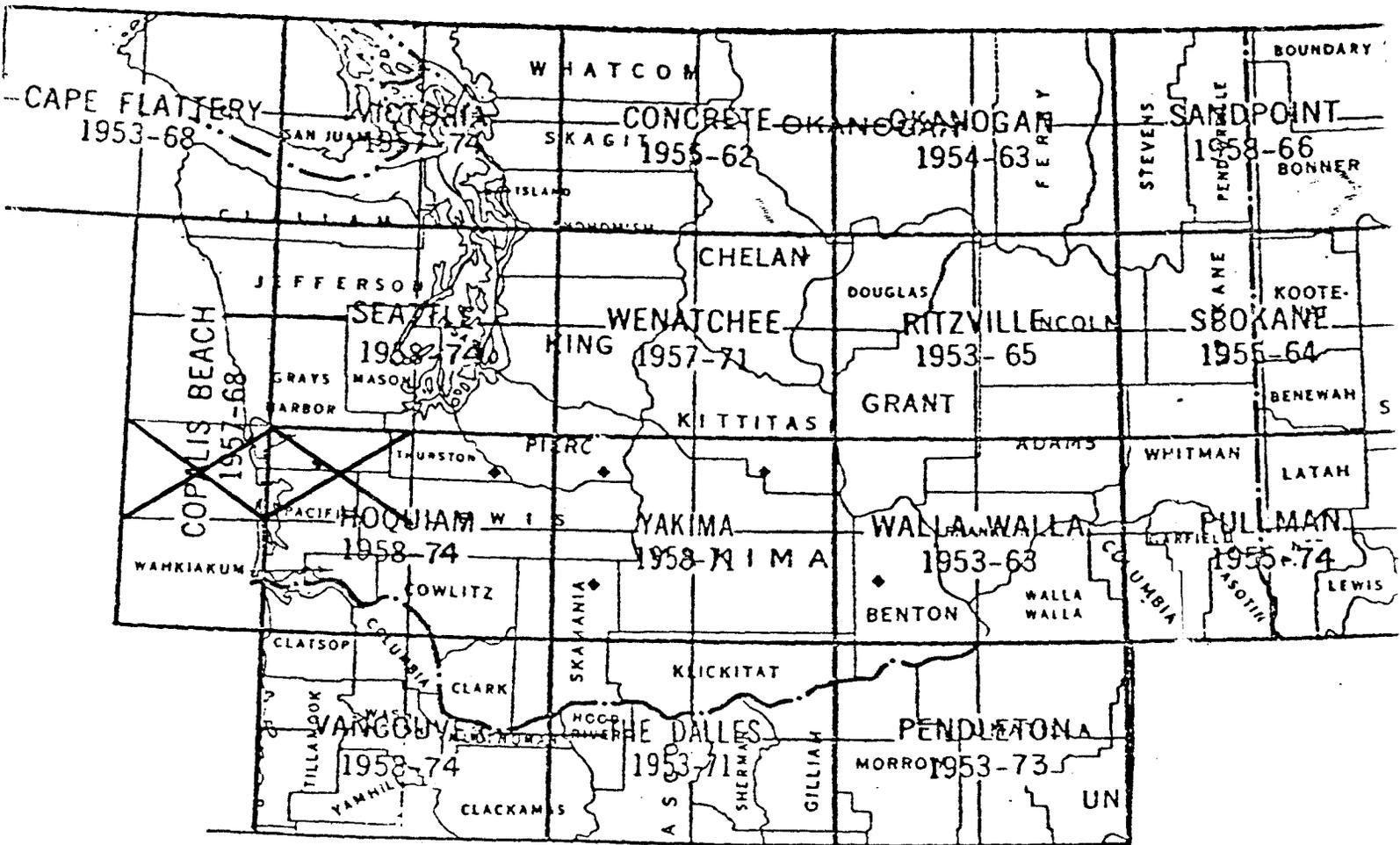
NWI CODE	DESCRIPTION	COMMON DESCRIPTION	VEGETATION SUBSTRATE
M1OWL	Marine subtidal open water	Open ocean	Open water
M2BB	Marine intertidal beach bar	Beach	Unvegetated sand, gravel coastline
E1OWL	Estuarine subtidal flat	Bay, sound	Open water
E2FL	Estuarine intertidal flat	Tide flat	Unvegetated mud, sand, gravel exposed by tides
E2AB	Estuarine intertidal aquatic bed	Sea grass bed, algal flat	<u>Zostera</u> spp. (eel grass) <u>Ulva</u> spp. (alga)
E2EM	Estuarine intertidal emergent	Salt marsh	<u>Salicornia</u> spp. (pickle weed) <u>Distichlis spicata</u> (salt grass) <u>Potentilla pacifica</u> (silver weed) <u>Carex lyngbeii</u> (lyngby's sedge) <u>Deschampsia</u> spp. (hair grass)
E2SB	Estuarine intertidal streambed	Tidal channel	Unvegetated mud, sand, gravel
L1OW	Lacustrine open water	Lake	Open water
L1OWK	Lacustrine limnetic open water artificially flooded	Reservoir, impoundment	Open water
L2FL	Lacustrine littoral flat	Lake flat	Unvegetated mud, sand, gravel
L2AB	Lacustrine aquatic bed	Pond weeds, water weeds	<u>Nuphar</u> spp. (water lily) <u>Lemna</u> spp. (duck weed) <u>Potamogeton</u> spp. (pond weed) <u>Myriophyllum</u> spp. (milfoil)
R1OW, R2OW, R3OW	Riverine perennial open water	River, stream	Open water, year round flow
R4SB	Riverine intermittent streambed	Intermittent stream	Unvegetated river bottom
R1FL, R2FL, R3FL	Riverine flat	River bar, river flat	Unvegetated mud, sand, gravel

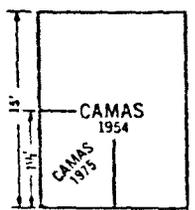
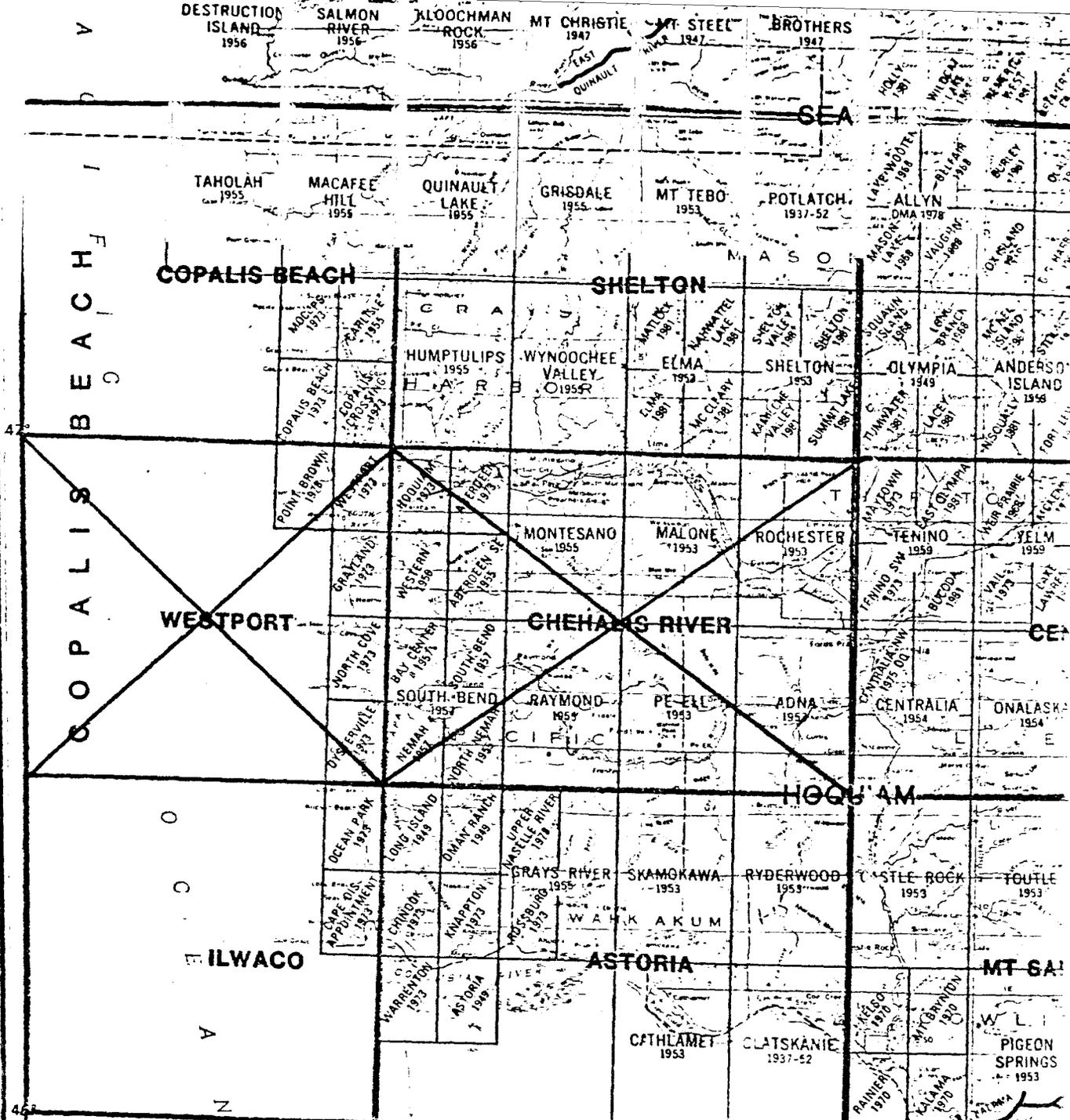
SUMMARY OF WETLANDS AND DEEPWATER HABITATS

NWI CODE	DESCRIPTION	COMMON DESCRIPTION	VEGETATION SUBSTRATE
POW	Palustrine open water	Pond	Open water
POWK	Palustrine open water, artificially flooded	Farm pond, impoundment	Open water
PAB	Palustrine aquatic bed	Pond weeds	<u>Najas</u> spp. (water lily) <u>Lemna</u> spp. (duck weed) <u>Potamogeton</u> spp. (pond weed) <u>Myriophyllum</u> spp. (milfoil)
PFL	Palustrine flat	Pond flat	Exposed pond bottom
PEM1	Palustrine emergent, persistent	Marsh, wet meadow, tule	<u>Scirpus</u> spp. (bulrush) <u>Typha</u> spp. (cattail) <u>Juncus</u> spp. (rush) <u>Eleocharis</u> spp. (spike rush) <u>Carex</u> spp. (sedge) <u>Phalaris</u> spp. (reed grass)
PSS1	Palustrine scrub/shrub, broadleaf deciduous	Shrub swamp	<u>Salix</u> spp. (willow) <u>Alnus rubra</u> (red alder) <u>Spiraea douglassi</u> (hardhack)
PSS4	Palustrine scrub/shrub, needleleaf evergreen	Shrub swamp	<u>Pinus contorta</u> (beach pine)
PF01	Palustrine forested, broadleaf deciduous	Swamp	<u>Alnus rubra</u> (red alder) <u>Fraxinus latifolia</u> (Oregon ash) <u>Acer macrophyllum</u> (bigleaf maple) <u>Populus trichocarpa</u> (cottonwood)
PF04	Palustrine forested, needleleaf evergreen	Swamp	<u>Thuja plicata</u> (w. red cedar) <u>Picea sitchensis</u> (sitka spruce)
PF	Palustrine farmed	Cranberry bog (commercial harvest)	<u>Vaccinium oxycoccus</u> (cranberry)

NOTES TO USERS

1:100,000 areas comprising Southwest Coastal Washington and Willapa Hills.





TOPOGRAPHIC MAPS PUBLISHED SHOWING DATE OF LATEST INFORMATION

MAPS OF THE SAME AREA ON 2 SCALES WHEREVER THE SAME NAME APPLIES TO 2 OR MORE MAPS COVERING THE SAME AREA, AN ORDER SHOULD ALSO INCLUDE THE SERIES DESIGNATION (7 1/2' CAMAS, 15' CAMAS)

- (B1 00) FOLLOWING A QUADRANGLE DATE INDICATES AN ORTHOPHOTOQUAD (MONOCOLOR PHOTOGRAPHIC IMAGE MAP WITHOUT TOPOGRAPHIC DETAIL) IS AVAILABLE IN ADDITION TO THE TOPOGRAPHIC MAP
- 1980 00 FOLLOWING A QUADRANGLE NAME INDICATES AN ORTHOPHOTOQUAD ONLY IS AVAILABLE
- (5) FOLLOWING A QUADRANGLE NAME INDICATES MAP ALSO AVAILABLE IN A SHADED RELIEF EDITION
- (*) FOLLOWING A QUADRANGLE DATE INDICATES MAP IS A TOPOGRAPHIC-BATHYMETRIC EDITION (COMBINES INTO ONE EDITION THE DATA PREVIOUSLY SHOWN SEPARATELY ON THE USGS TOPOGRAPHIC MAP AND THE NATIONAL OCEAN SURVEY (NOS. BATHYMETRIC MAP)

RIVER SURVEYS
SEE TEXT
MAPS PUBLISHED