



United States Department of the Interior

FISH AND WILDLIFE SERVICE

LLOYD 500 BUILDING, SUITE 1692
500 N.E. MULTNOMAH STREET
PORTLAND, OREGON 97232



(503) 231-6154 FTS:429-6154

NATIONAL WETLAND INVENTORY

NOTES TO USERS

SAN FRANCISCO BAY, CALIFORNIA

1:100,000 SCALE MAPS COVERED

Napa	-	Santa Rosa SE
San Francisco	-	San Francisco NE
Palo Alto	-	San Francisco SE

NATIONAL WETLAND INVENTORY

NOTES TO USERS

San Francisco Bay Area

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 Napa, San Francisco, and Palo Alto 1:100,000 intermediate scale maps and the Milpitas 7-1/2° quad sheet (see attached index maps). The area extends from the coast inland to 122°W longitude and is bounded north and south by 38°30'N latitude and 37°N latitude, respectively.

According to Bailey's ecoregions, the area is in the Humid Temperate Domain, Marine Division, California Mixed Evergreen Section. Its climate is characterized by generally mild temperatures averaging 35° to 50°F (2° to 10°C) through the year. Rainfall is heavy, 30 to 150 in. (750-3800 mm); maximum rainfall comes in winter. The area is winter wet with no snow; fog partially compensates for summer drought.

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 for wetlands photointerpretation:

<u>Map</u>	<u>Scale</u>	<u>Film</u>	<u>Date</u>
Napa	1:80,000	Black & White	10/76
	1:120,000	Color infrared	6/73
San Francisco	1:130,000	Color infrared	6/76
	1:120,000	Color infrared	10/72
	1:80,000	Color infrared	10/72
Palo Alto	1:80,000	Black & White	10/76
	1:130,000	Color infrared	6/76

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.

Limited field reconnaissance was conducted in the winter and spring of 1979 and late 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 Area Information Systems (AIS), Crestline, California. Maps were prepared by Martel Laboratories, Inc., and the NWI National Team in St. Petersburg, Florida.

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

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 (MLOW), Estuarine system (ELOW, ELUBL), Riverine system (RLOW, R2OW, R3OW), Lacustrine system (LLOW), and Palustrine system (POW).

Aquatic beds in the marine system (M1AB) are composed primarily of kelp (Macrocystis spp., Nereocystis spp.) and are considered deepwater habitats.

Unvegetated wetlands, present in all systems, include the classes beach/bar (BB), flats (FL), and rocky shore (RS). Beach/bar and rocky shore are generally restricted to the open coast within the marine system (M2BB, M2RS). Estuarine flats may support communities of aquatic bed. Estuarine aquatic bed (E2AB) may be present as algal mats (Ulva spp., Enteromorpha spp.) or as sea grass beds (Ruppia maritima, Zostera spp.).

Emergent wetlands (persistent) are present in the Estuarine and Palustrine system. Estuarine emergent wetlands (E2EM) are dominated by such species as pickleweed (Salicornia spp.), saltgrass (Distichlis spicata), salt cordgrass (Spartina foliosa), three square (Scirpus americanus) gum weed (Grindelia spp.) jaumea (Jaumea carnosa), Pacific silverweed (Potentilla pacifica), frankenia (Frankenia grandifolia), and salt bush (Artiplex spp.). Less saline estuarine emergent wetlands (brackish marsh) support such species as Olney's bulrush (Scirpus olneyi), rush (Juncus balticus), cattail (Typha spp.), alkali bulrush (Scirpus robustus), and brass buttons (Cotula coronopifolia).

Numerous salt evaporation ponds have been developed in the San Francisco Bay area. These have been classified as artificially maintained estuarine subtidal unconsolidated bottom (E1UBKL).

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.), smartweeds (Polygonum spp.) reed grass (Calamagrostis spp.), nutgrass (Cyperus spp.), mannagrass (Glyceria spp.), and bentgrass (Agrostis spp.). Vernal pool wetlands (PEMW) are a wetland type essentially unique to California. These wetlands contain certain species of Juncus, Scirpus, and Carex as well as some species found only in vernal

wetlands. Such species include eryngium (Eryngium spp.), loose strife (Lythrum hyssopifolia), downingia (Downingia spp.), blennosperma (blennosperma nanum), skunk weed (Navarreta spp.), meadow foam (Limnanthes douglasii), brodiaea (Brodiaea spp.), and hairgrass Deschampsia danthonoides).

Palustrine scrub shrub (PSS) wetlands are characterized by woody species. Common wetland shrub species include willow (Salix spp.), red alder (Alnus rubra), white alder (A. rhombifolia), red osier dogwood (Cornus occidentalis), baccharus (Baccharus spp.), and elderberry (Sambucus spp.). Typical forest (PFO) species are red alder, sycamore (Plantanus racemosa) and cottonwood (Populus fremonti). Some forested wetlands of a temporary nature (PFO) contain cottonwood, eucalyptus (Eucalyptus spp.), or Valley oak (Quercus lobata). The classification of scrub/shrub or forested wetlands is determined by height-forested greater than 6m. and scrub/shrub less than 6m.

Historically large areas of estuarine emergent wetlands were diked off from tidal influence. These wetlands are classified as Palustrine farmed (Pf). Diked former estuarine tidelands are commonly characterized by such species as pickleweed, saltgrass, rushes, brass buttons, plantain (Plantago spp.), salt bush, "sickle" grasses (Monerma cylindria and Paraphalis incurua), and various "weedy" or "ruderal" grasses on high spots.

The Riverine system includes the classes open water (OW), flats (FL), and streambeds (SB). Open water and flats are restricted to the Riverine tidal (R1OW), 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.

Streams which do not flow year round are classified as Riverine intermittent Streambeds (R4SB). Some riverine systems have their banks lined with trees or shrubs.

In cases where streamside palustrine scrub/shrub or palustrine forested wetlands cannot be separately delineated from the riverine system, the wetlands are mapped as linear palustrine wetland features (PSS or PFO).

Natural or artificial basins greater than 20 acres are in the Lacustrine system. The Lacustrine system on the NWI maps includes the classes lacustrine open water (L1OW, L2OW), aquatic bed (L2AB), and flats (L2FL). The open water areas are covered by water whereas the flats are exposed at some time during the growing season. Common lacustrine aquatic bed (L2AB) species include duck weed (Lemna spp.), pond weed (Potamogeton spp.), and water lily (Nymphaea spp.). Basins less than 20 acres are classified as palustrine, with classes as described above; i.e., palustrine open water (POW), palustrine aquatic bed (PAB), and palustrine flat (PFL).

Modifiers

The intermediate-scale (1:100,000) 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.

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. 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, in this case about 3,200 square miles, 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.

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.

Faber, P.M. 1982. Common Wetland Plants of Coastal California. Pickleweed Press, Mill Valley, California.

Holland, R., and S. Jain. 1977. "Vernal Pools" p.515-533. In M.G. Barbour and J. Major. Terrestrial Vegetation of California. John Wiley and Sons, New York.

San Francisco Bay Conservation and Development Commission, 1982. Diked Historic Baylands of San Francisco Bay. Staff Report.

United States Department of the Interior. 1981. An Ecological Characterization of the Central and Northern California Coastal Region. FWS/OBS-80/48.1, FWS/OBS-80/47.1.

