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NATIONAL WETLANDS INVENTORY

NOTES TO USERS

KLAMATH BASIN

1:100,000 SCALE MAPS COVERED

KLAMATH FALLS, SW

KLAMATH FALLS, NW

✓ ALTURAS, NW

## Map Preparation

The wetland classifications that appear on the Klamath Basin National Wetlands Inventory (NWI) 1:100,000 maps of Klamath falls NW and SW and Alturas NW are in accordance with Classification of Wetlands and Deepwater Habitats of the United States, Cowardin, et al., 1979. Wetland delineations and classifications were produced through stereoscopic interpretation of 1:58,000 scale color infrared photography. Photographs were taken during July and August of 1982 for the Klamath Falls NW and SW 1:100,000 and taken during June, July and September of 1981 for the Alturas NW 1:100,000.

The user of the map is cautioned that, due to the limitation of mapping primarily through aerial photointerpretation, a small percentage of wetlands may have gone unidentified. Changes in the landscape could have occurred since the time of photography, therefore, some discrepancies between the map and current field conditions may exist. Any discrepancies that are encountered in the use of this map should be brought to the attention of Dennis Peters, Regional Wetlands Coordinator, U.S. Fish and Wildlife Service, Region 1, Lloyd Building, Suite 1692, 500 NE Multnomah Street, Portland, Oregon 97232, telephone (503)231-6154

## Geography

The area covered by the Klamath Basin is located along the northeastern California, southeastern Oregon border. Included in this area are the Winema, Fremont, Modoc and Klamath National Forests, Sycan and Klamath Lakes, and the Yonna, Langell, Poe, Swanlake and Srague River Valleys. The Majority of the work area is described by Bailey (1980) as part of the Intermountain Sagebrush Province which occupies the physiographic section called the Great Basin. Two sections of this province are included in the Klamath Basin area: Sagebrush Wheatgrass and Ponderosa Shrub Forest. The NW corner of the Klamath Falls NW 1:100K and SW corner of the Klamath Falls SW 1:100K comprise part of the Silver Fir-Douglas Fir Forest. The NW corner of the Alturas NW 1:100K falls within the Cedar-Hemlock-Douglas-fir Forest. Both the Silver Fir-Douglas Fir and the Cedar-Hemlock-Douglas-fir Forests are sections of the Pacific Province. The Sierran Forest Province is found in the SW corner of the Alturas NW 1:100K.

The great basin area consists mostly of semiarid, sagebrush covered plains from which many mountains steeply rise. Much of the area comprises numerous separate interior basins. The lower parts of many basins have a heavy accumulation of alkaline and saline salts. Mountains are well vegetated with upper elevations bearing sparse conifer forests. Streams are rare and few are permanent in the great basin. Flows of these streams vary from

year to year and from season to season. Rivers in mountainous regions are swiftly flowing permanent streams whose flows decrease when they meet large valleys. Important rivers in this area include the Williamson, Wood, Srague and Klamath Falls.

Sagebrush is the dominant plant of lower elevations in the intermountain sagebrush province. Other important plants are shadscale, four wing saltbush, rubber rabbit brush, horse brush and spiny hopsage. In areas where salt concentration is very high, these plants are replaced by grease wood and saltgrass communities. Forest vegetation includes aspen, cottonwood, russian olive and willow. In the Montane belt, Ponderosa pine generally occupies the lower and more exposed slopes and Douglas fir the higher and more sheltered ones. In the subalpine belt, the characteristic trees are subalpine fir and Engelmann spruce. Only a few mountains rise high enough to support an alpine belt community.

The Sierran Forest Province is characterized by steeply sloping to precipitous mountains crossed by many valleys with steep gradients. West slopes rise gradually while east slopes drop abruptly to the floor of the great basin. Much of the region has been glaciated. Ground water provides a small percentage of water. Run off from rain and snow in the Cascade, Siskiyou and Klamath Mountains is the main source of water.

The vegetation of the Sierran Forest Province is marked by zonation. On the lower slopes (1500 to 4000 feet), buckbrush and manzanita predominate. Montane zones (2000 to 6000 feet) have Jeffery pine, Douglas fir, sugarpine, white fir and incense cedar. The subalpine zone (6500 to 9500 feet) has communities of mountain hemlock, California red fir, lodgepole pine, western pine and whitebark trees. The Pacific forest province is primarily montane. Principle trees of the dense coniferous forest are Douglas fir, Western red cedar, western hemlock, grand fir, silver fir and Sitka spruce.

#### Climate

The major climatic features of this area are dry summers with the majority of precipitation falling during the winter. Average temperatures range between 35° to 55°F.

Growing seasons vary considerably among the numerous basins. Southern basins, such as the lower Klamath, have growing seasons of about 90 to 120 days. While other basins further north, like the Wood River Valley, have growing seasons less than 50 days.

In mountainous areas, precipitation increases, while temperatures decrease with altitude. The high humidity of the Pacific Forest provides a favorable precipitation/evaporation ratio.

## Soils

Hydric soils have been defined by the U.S. Conservation Service as soil that in its undrained condition is saturated, flooded or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation.

Soils that were formerly wet but are now completely drained are not considered hydric soils. This condition must be determined on a site-specific basis. Also excluded from the definition of hydric soils are soils that were not naturally wet but are now subject to periodic flooding or saturation for specific management purposes (e.g., waterflow impoundments) or flooded by accident (e.g., highway-created impoundments). Moreover, soils that are frequently flooded for short intervals, not long enough to support hydrophytes, do not represent hydric soils.

The dominant soils of all basins and lowland areas are Aridisols. At higher elevations Mollisols predominate. Narrow bands of Entisols are in stream floodplains of this area. Salt flats and playas without soils are extensive in the lower parts of the basins that have interior drainage.

The mountain slopes of the Sierran Forest Province consist of Ultisols where air is humid. Dry Alfisols predominate at lower elevations in this province. The alluvial fans and narrow floodplains of the valleys for the area are occupied by Entisols.

Broad wetland soil associations are described as follows. Not mentioned here are other types of soils that may make up small inclusions within these and other hydric soils found elsewhere as a small part of well drained soil association.

These hydric soil associations have a few common characteristic features such as a slope of 0 to 2%, an elevation of 4000 to 4400 feet, and a nesting and feeding resource by waterfowl.

Representative hydric Soil associations included in Klamath County are as follows:

Henley-Poe-Laki: moderately deep or very deep, somewhat poorly drained soils that formed in alluvial and lacustrine sediment.

This association is located in Modoc Point and on low terraces along lost and Klamath Rivers. About 30% of the unit is Henley soils, 20% Poe soils, 15% laki soils, and the remaining is soils of minor extent.

All three soils are strongly or moderately alkaline. Henley and Poe soils are somewhat poorly drained compared with the Laki soils which are better drained and have a lower water table depth. Much of this soil is irrigated pasture or cropland but some is also suburban land. This association makes up a small percentage of the overall area.

Malin - Scherrard - Pit: moderately deep or very deep, somewhat poorly drained and poorly drained soils that formed in alluvial and lacustrine sediment.

These soils are found on floodplains and low terraces along Lost River and on lake bottoms in Swan Lake, Long Lake, and Round Lake Valleys. Approximately 30% of the unit is Malin soils, 10% Scherrard soils, 10% Pit soils, and 50% is soils of minor extent. The Malin and Scherrard soils are strongly alkaline or very strongly alkaline and are somewhat poorly drained. The Pit soils are neutral to moderately alkaline and are poorly drained. This soil is generally used for irrigated pasture and cereal hay.

Tulana - Algoma - Teeters: very deep, poorly drained soils that formed in diatomaceous sediment.

This soil association is on the drained bottom of lower Klamath Lake, on the adjacent floodplain of the Klamath River, and on drained embayments along the southern & eastern sides of Upper Klamath Lake. Approximately 50% of the unit is Tulane soils, 30% Algoma soils, about 15% Teeters soils, and the rest of minor extent. The Tulana soils are slightly acid to mildly alkaline in the upper part and slightly acid to very strongly acid in the lower part. The Algoma and Teeters soils are strongly alkaline in the upper part. All soils are poorly drained and Teeters and Algoma soils are inundated for long periods unless protected by dikes. This land is used mainly for irrigated pasture, barley, oats, and cereal hay. Other users of these wetlands include ducks and geese, since this is in the path of one of the major waterfowl flyways in the Pacific Northwest.

Klamath-Ontko-Yonna: very deep, poorly drained soils that formed in alluvium derived mainly from diatomite and in ash.

Areas of this association are on floodplains mainly along the Sprague and Williamson Rivers. The Klamath soil makes up approximately 40% of the unit, Ontko is 30%, Yonna is 15% and minor soils are found in the remainder. Klamath and Ontko soils are neutral in the upper layers with a water table depth of 0 to 4 feet. The Yonna soils are strongly or very strongly alkaline in the upper layers and a water table depth of 2 to 5 feet. The wetness of these soils makes this ideal for native wet meadow pasture or irrigated pasture. The soils are subject to flooding unless protected by dikes.

Kirk-Chock: very deep, poorly drained soils that formed in alluvium derived from cinders and ash.

This soil type is located on the floodplains that make up most of the Wood River Valley. Approximately 70% of the unit is Kirk soils, 20% Chock soils, and 10% is mainly soil consisting of a dark silt over gravelly sand in narrow swales and potholes. Both Kirk and Chock soils consist of loam and ash with a water table depth of 1 to 2.5 feet. The soils are subject to flooding in spring unless protected by dikes. The major land use is irrigated or subirrigated pasture.

Lather-Histosols, ponded: very deep, very poorly drained muck that formed in organic material.

This soil unit is on diked and drained parts of Agency lake Marsh, on drained embayments along the southern side of Upper Klamath Lake and in adjacent areas of marsh. Approximately 60% is lather soils, 35% Histosols, ponded, and 5% is soils of minor extent.

These organic soils have a high water table at a depth of 0 to 3 feet. The lather soils are medium acid to neutral in the upper layers and strongly acid to slightly acid in the lower layers, with a surface layer of muck. Histosols, ponded, are areas of marsh that have a floor of organic material with a third of the area consisting of scattered clumps of aquatic plants and small hillocks.

The lather soils can support irrigated pasture and some crops. Histosols, ponded, mainly are a waterfowl refuge and is used by large numbers of migratory ducks and geese.

### Wetland Communities

#### Riverine

Major perennial rivers in the Klamath Basin include the Wood, Klamath, Sycan, Williamson, and Sprague Rivers.

Perennial rivers in the Klamath Basin area move swiftly and are mostly upper perennial with an unconsolidated bottom. Some slow down and become lower perennial where their gradient changes at the edge of large valleys. These may have an unconsolidated bottom or contain aquatic bed such as algae, pondweed (Potamogeton sp.), water lily (Nuphar sp.), water shield (Brasenia sp.), or duckweed (Lemna minor). Some perennial rivers have sand bars (unconsolidated shores) which flood seasonally or temporarily.

Intermittant streams in the area may flood seasonally or temporarily. Drainage ditches and irrigation canals are intermittant also and were mapped with excavated modifiers. They may be flooded seasonally or semipermanently. Some contain aquatic bed such as algae or duckweed (Lemna minor). Some contain emergents and are included in the Palustrine system.

Some riverine systems have their banks lined with persistent wetland vegetation. In cases where wetland vegetation cannot be separately delineated from the riverine system, the wetlands are mapped as linear Palustrine features.

### Lacustrine

The Klamath Basin area includes numerous lakes and reservoirs greater than twenty acres. Major lakes are Agency Lake, Upper and Lower Klamath Lakes, Clear Lake and Tule Lake. These major lakes are all part of the National Wildlife Refuge System and contain numerous structures to control flooding and influence vegetation.

Lakes in the area may range from temporary to permanent. They have unconsolidated bottoms and some contain aquatic bed, such as pondweed, duckweed, water shield, or algae.

### Palustrine

Many of the wetlands in the Klamath Basin are vegetated. This is true of excavated and impounded ponds as well as natural systems. Permanent, semipermanent, and intermittantly exposed ponds usually contain aquatic bed, such as algae, Lemna minor, Potamogeton sp., Nuphar sp., and Brasenia sp.

Temporary emergent wetlands consisted of rushes (Juncus sp.), fescue (Festuca sp.), tufted hairgrass (Deschampsia sp.), composites (Aster sp.), iris (Iris sp.) and yarrow (Achillia millefolium). Seasonal wetland emergents included sedges (Carex sp.), Deschampsia sp., cinquefoil Potentilla sp., composites (Aster sp.), rushes (Juncus sp.), American three-square (Scirpus americanus), timothy grass (Phelum sp.), canary grass (Phalaris arundicaea) and foxtail barley (Hordeum jubatum). Emergents on semipermanent wetlands included cattail (Typha latifolia), hardstem bulrush (Scirpus acutus) and nettle (Stachys sp.). Emergents in national wildlife refuges were given the artificial water regime.

Seasonal emergent valleys are often enhanced by irrigation. Springs are often surrounded by seasonal vegetation. Springheads may be easily identified by the abundance of monkey flower (Mimulus guttatus.) associated with them.

Scrub shrub communities consisted of two types; one type with willows (Salix sp.) or cottonwood (Populus spp.) along riverbanks or in depressions which were given either the temporary or seasonal water regimes and a second type of silver sage (Artemisia cana) playas which were temporarily flooded.

Forested wetlands were both temporarily or seasonally flooded and consisted of lodgepole pine (Pinus contorta), black cottonwood (Populus balsamifera trichocarpa), willows and/or quaking aspen (Populus tremula tremuloides).

This area also included unvegetated palustrine wetlands. Subalpine ponds have unconsolidated bottoms and are permanent. Small alkali flats in the valleys may flood temporarily or seasonally.

#### REFERENCES

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Table 1  
COMMON NWI WETLAND CODES

NWI CODE	NWI DESCRIPTION	COMMON DESCRIPTION	CHARACTERISTIC VEGETATION AND PHYSIOGRAPHIC FEATURES
R3UB	Riverine, upper perennial, unconsolidated bottom	River	Open water
R3AB	Riverine, upper perennial, aquatic bed	River with pond weeds	<u>Potamogeton</u> spp. <u>Nuphar</u> spp. <u>Brasenia</u> spp. Algae, <u>Lemna minor</u>
R3US	Riverine, upper perennial, unconsolidated shore	Sand bar	Sand
R2UB	Riverine, lower perennial unconsolidated bottom	River	Open water
R2AB	Riverine, lower perennial, aquatic bed	River with pond weeds	<u>Potamogeton</u> spp. <u>Nuphar</u> spp. <u>Brasenia</u> spp. Algae <u>Lemna minor</u>
R2US	Riverine, lower perennial, unconsolidated shores	Sand bar	Sand/gravel
R4SB	Riverine, intermittent, stream bed	Stream	Sand
L1UB	Lacustrine, limnetic, unconsolidated bottom	Lake	Open water

Table 1  
COMMON NWI WETLAND CODES

NWI CODE	NWI DESCRIPTION	COMMON DESCRIPTION	CHARACTERISTIC VEGETATION AND PHYSIOGRAPHIC FEATURES
L2UB	Lacustrine, littoral, unconsolidated bottom	Shallow lake areas	Open water
L2AB	Lacustrine, littoral, aquatic bed	Shallow lake areas with pond weeds	Algae <u>Potamogeton</u> sp. <u>Nuphar</u> sp. <u>Brasenia</u> sp. <u>Lemna minor</u>
L2US	Lacustrine littoral, unconsolidated shore	Lake shoreline	Sand
PUB	Palustrine, unconsolidated bottom	Ponds	Open water
PAB	Palustrine, aquatic bed	Ponds	<u>Potamogeton</u> spp. <u>Brasenia</u> spp. <u>Nuphar</u> spp.
PUS	Palustrine, unconsolidated shore	Alkali flats	Salt crystals
PEM	Palustrine, emergents	Marsh, Meadow	<u>Juncus</u> spp. <u>Deschampsia</u> spp. <u>Festuca</u> spp. <u>Potentilla</u> spp. <u>Phelum</u> spp. <u>Scirpus americana</u> <u>Carex</u> spp. <u>Scirpus</u> spp. <u>Typha latifolia</u> <u>Mimulus guttatus</u> <u>Aster</u> spp. <u>Rumex</u> spp.
PSS	Palustrine, shrubs	Shrub wetland	<u>Artemesia cana</u> <u>Salix</u> spp.
PFO	Palustrine, Forested	Forested wetland	<u>Pinus contorta</u> <u>Populus trichocarpa</u> <u>Salix</u> spp. <u>Spirea douglassii</u>