

# NATIONAL WETLAND INVENTORY USER REPORT 1:100,000 MAP AREA

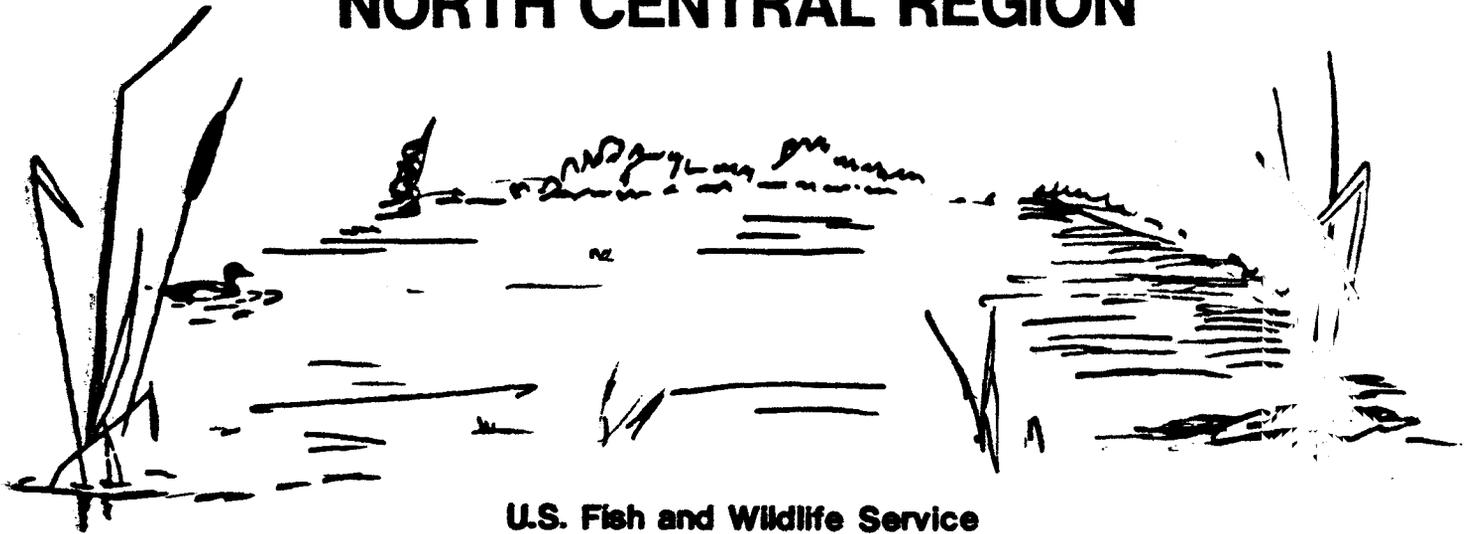
**MAP AREA:** TWO HARBORS NE

**1:100,000 NAME:** GRAND MARAIS

**STATE:** MINNESOTA



## NORTH CENTRAL REGION



**U.S. Fish and Wildlife Service**

**Federal Building, Fort Snelling Twin Cities, Minnesota 55111**



### USER CAUTION

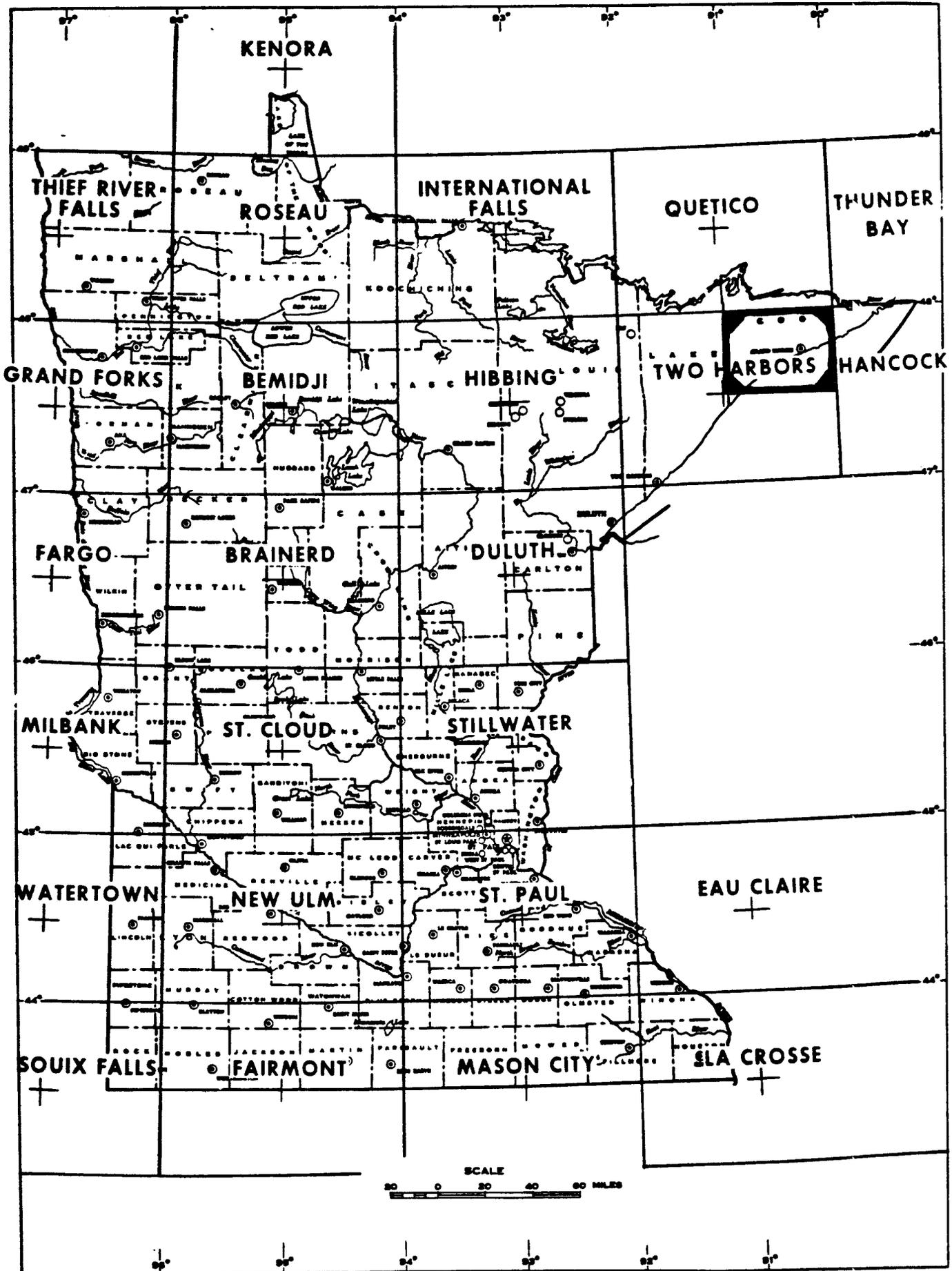
Maps for this 1:100,000 scale map were prepared primarily by stereoscopic analysis of high altitude aerial photographs. Wetlands were identified on the photographs based on vegetation, visible hydrology, and geography in accordance with Classification of Wetlands and Deepwater Habitats of the United States, Cowardin, et al., 1979. The aerial photographs reflect conditions during the specific year and season when they were taken. Some small wetlands and those obscured by dense forest cover may not be included on the map document. In addition, there is a margin of error inherent in the use and interpretation 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.

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 design or products of this inventory, to define limits of proprietary jurisdiction of any local, State, or Federal 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 propriety jurisdictions that may affect such activities.

Additional information regarding this map or other National Wetland Inventory activities may be obtained by contacting:

Regional Director, Region 3 (AH/TS)  
Attn: Regional Wetlands Coordinator  
United States Fish and Wildlife Service  
Federal Building, Fort Snelling  
Twin Cities, Minnesota 55111

LOCATION OF REPORT AREA  
STATE OF MINNESOTA



DATE: December 1983

MAP PREPARATION

Basic Data

Photography Used:

<u>Emulsion</u>	<u>Scale</u>	<u>Date</u>	<u>Percent Coverage</u>
1. Black and white	1:80,000	May 1976	17.5%
2. Black and white	1:80,000	October 1978	61.0%
3. Black and white	1:80,000	May 1979	21.5%

Field Check Dates

1. May 14 - 16, 1980

Contractor(s) for Photo Interpretation

1. University of Massachusetts

Collateral Data Used

1. USGS topographic quad sheets
2. USDA soil surveys
3. USDA Forest Service maps of the Superior National Forest

Mapping Legend: (See Appendix D)

Farmed Wetlands

It is the policy of the Fish and Wildlife Service to not map farmed wetlands in the National Wetlands Inventory unless the wetland is a pothole-like depression, such as those found in the Prairie Pothole Region, intermittently flooded lake bottoms, cranberry bogs, or diked former tidelands in California. Therefore this map area may contain various amounts of non-depression type wetlands which were farmed on the date of the photography and intentionally not included in the inventory. Many of these omitted wetlands commonly occur in floodplains.

## GEOGRAPHY

### A. General Location

Degrees Longitude: 90° 0' to 91° West

Degrees Latitude : 47° 30' to 48° 0' North

Largest City : Grand Marais, Minnesota

Two Harbors NE is located in the "arrowhead" region of Minnesota in the northeastern part of the State and is bordered on the southeast by Lake Superior. Portions of the Superior National Forest and the Boundary Waters Canoe Area are included in the map area. This map encompasses a portion of Cook County and lies within the Lake Superior watershed.

### B. Ecoregion

Bailey's Ecoregion Classification and Description (Bailey 1978):

Code: 2111 L

Humid Temperate Domain (2000)

The entire Two Harbors NE map is in this Domain.

The climate of this Domain has strong seasonal temperatures and precipitation cycles, and a distinctive winter season. The Humid Temperate Domain comprises the humid midlatitude forests of broadleaf deciduous and needleleaf evergreen trees.

Warm Continental Division (2100)

All of the Two Harbors NE map lies within this Division.

This Division characteristically has warm summers and cold, snowy winters. The natural vegetation is needleleaf and mixed needleleaf-deciduous forest. The soils of this Division are Spodosols, which are strongly leached but have a top layer of humus. Spodosols are usually acidic and lack calcium, potassium and magnesium. Despite these deficiencies, Spodosols are very suitable for growing the conifers found in this Division.

Laurentian Mixed Forest Province (2110)

The entire Two Harbors NE map area falls within this Province.

The vegetation of this Province is representative of the transitional zone in which it lies, between the boreal and deciduous forest zones. Forests consist either of mixed conifer-deciduous stands or mosaic-like arrangements with pure stands of deciduous forest growing on good soil sites and pure stands of conifers growing on poor soil sites.

Pines (Pinus spp.) are the most representative conifers of the mixed forest stands, with white pine (P. strobus) dominating in the Great

Lakes region. Pines are often a pioneer woody species following forest fires. Eastern hemlock (Tsuga canadensis) and eastern redcedar (Juniperus virginiana) also grow in this Province.

Spruce-Fir Forest Section (2111 L)

This Section occurs in lowland areas throughout the Two Harbors NE map area.

Spruce (Picea spp.) and fir (Abies spp.) trees form the principal plant association of this section.

C. Topography and Land Forms

Hammond's Land Surface Form and Physical Subdivision (Hammond 1965, 1969):

Codes: (III-3) B3b, (III-3) C5d

Interior Physical Division (III) - The entire Two Harbors NE map area lies within this Physical Division.

North Central Lake-Swamp-Moraine Plains Subdivision (3) - This Subdivision covers all of the Two Harbors NE map area.

Plains With Hills Class (B3b) - This Class covers less than 25% of the map area in the southeast along the shore of Lake Superior. Fifty to 80% of the land is in gentle slopes. Fifty to 75% of these slopes occur in lowlands. Local relief ranges from 300 to 500 feet.

Open Low Mountains Class (C5d) - This Class covers all but the southeast 25% of the map area. Twenty to 50% of the land is in gentle slopes. More than 75% of these slopes are found in upland areas. Local relief ranges from 1000 to 3000 feet.

RESOURCES

A. Wetlands

Wetland density in the Two Harbors NE map area is very high, with highest concentrations occurring in the central, northcentral, and northwestern portions of the map. Steep topography has precluded extensive wetland formation in the southeast, near Lake Superior.

The most common wetland types in the Two Harbors NE map area are saturated forests and forest-shrub mixture. Black spruce (Picea mariana) is the predominant tree species of these wetlands, although northern white cedar (Thuja occidentalis) and tamarack (Larix laricina) are common. Shrubs which are found in these wetlands include speckled alder (Alnus rugosa), willow (Salix spp.) and dogwood (Cornus sp.).

Bogs are also common in the Two Harbors NE map area. Important bog species include tamarack, black spruce, leatherleaf (Chamaedaphne

calyculata), Labrador tea (Ledum groenlandicum), sphagnum moss (Sphagnum spp.) and sweet gale (Myrica Gale). A list of plant species for other wetland types can be found in Appendix C.

## B. Wildlife and Fish

Expansive forests cover much of the Two Harbors NE map area. Through natural selection, these forests are changing from young, uneven-aged, mixed hardwood-conifer stands to even-aged, homogeneous spruce-fir forests. This change is causing a downward population trend for some species which prefer the diversity of habitat types afforded by the younger forests, such as the white-tailed deer (Odocoileus virginianus), black bear (Ursus americanus), moose (Alces alces), snowshoe hare (Lepus americanus), ruffed grouse (Bonasa umbellus) and American woodcock (Philohela minor). The spruce grouse (Canachites canadensis), however, prefers the spruce-fir forests. Populations of aquatic furbearers, including beavers (Castor canadensis) and muskrats (Ondatra zibethica), are common in the area.

Some production of black ducks (Anas rubripes), mallards (Anas platyrhynchos), mergansers (Mergus spp.) and common goldeneyes (Bucephala clangula) occurs in the area. The best waterfowl habitat in the area consists of beaver ponds, small flows and lake bays.

Other wildlife species that inhabit the map area include the woodchuck (Marmota monax), porcupine (Erethozon dorsatum), red squirrel (Tamiasciurus hudsonicus), eastern gray squirrel (Sciurus carolinensis), eastern fox squirrel (S. niger), red fox (Vulpes vulpes) and bobcat (Lynx rufus). Most of these species have maintained relatively stable populations.

Wildlife species in the area that are on the Endangered and Threatened list include timber wolves (Canis lupis) and bald eagles (Haliaeetus leucocephalus). Northeastern Minnesota, including Two Harbors NE, has the largest timber wolf population in the United States (Great Lakes Basin Commission 1975b, Mann 1955).

Sport fishing occurs in many inland lakes and streams, and in Lake Superior and its immediate tributaries. Commercial fishing is limited to Lake Superior.

Fish species commonly found in the inland lakes include walleyes (Stizostedion vitreum vitreum), northern pike (Esox lucius), and smallmouth bass (Micropterus dolomieu). Lake trout (Salvelinus namaycush) are found in some rock-bound lakes. Stream species include brook trout (Salvelinus fontinalis), brown trout (Salmo trutta) and rainbow trout (Salmo gairdneri).

Common sport fish of Lake Superior and its tributaries include rainbow smelt (Osmerus mordax), perch (Perca sp.), suckers (Catostomus), panfish (Lepomis spp., Pomoxis spp.), northern pike, walleyes, bass (Micropterus sp.), coho salmon (Onchorhynchus kisutch) and rainbow, brook, and brown trout. Lake herring (Coregonus artedii) account for

a large share of the commercial catch out of Lake Superior, as do chubs (Semotilus), lake whitefish (C. clupeaformis) and smelt. Lake trout are of minor importance commercially; sea lampreys (Petronyzon marinus) have prevented this species from establishing a self-reproducing population in recent years (Great Lakes Basin Commission 1975a).

Appendix A

REFERENCES

- Bailey, R. G. 1978. Descriptions of the ecoregions of the United States. USDA For. Serv. Intermtn. Reg. Ogden, Utah. 77 p.
- Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U. S. Fish and Wildlife Service, Washington, D. C. FWS/OBS-79/31. 103 p.
- Great Lakes Basin Commission. 1975a. Fish: Great Lakes Basin Comm. Great Lakes Basin Framework Study, App. 8. Ann Arbor, Mich. 290 p.
- 1975b. Wildlife: Great Lakes Basin Comm. Great Lakes Basin Framework Study, App. 17. Ann Arbor, Mich. 140.
- Hammond, E. H. 1965. 1:17,000,000 scale Physical Subdivisions. 1 map. p. 61. In Gerlach, A. C., ed. 1970. National atlas of the United States of America. USDI Geol. Surv. Washington, D. C. 417 p.
- 1969. 1:7,500,000 scale Classes of Land Surface Form. USDI Geol. Surv. 1 map. p. 62-63. In Gerlach, A. C., ed. 1970. National atlas of the United States of America. USDI Geol. Surv. Washington, D. C. 417 p.
- Mann, G. E. 1955. Wetlands inventory of Minnesota. U. S. Fish and Wildlife Service, Office of River Basin Studies. Minneapolis, Minn. 42 p.

ADDITIONAL INFORMATION

The purpose of this report is to provide general information regarding the production of the map and wetlands found within the area of this map. It does not include descriptions of all wetlands found in the area nor complete species information. For additional information, the following references are recommended:

- Hammond, E. H. 1964. Analysis of Properties in Land Form Geography: An Application to Broad-Scale Land Form Mapping. Annals, Assoc. Amer. Geog. v. 54. p. 11-23.
- Herdendorf, C. E., S. M. Hartley, and M. D. Barnes, eds. 1981. Fish and Wildlife Resources of the Great Lakes Coastal Wetlands Within the United States. Volume Six: Lake Superior. U. S. Fish and Wildlife Service, Washington, D. C. FWS/OBS-81/02. v. 6. 846 p.

Appendix B

SPECIAL MAPPING PROBLEMS

Problem 1: Poor resolution of photography made it difficult to distinguish some Forested (FO) wetlands from upland areas (ex. Sawbill Camp quad). Flooding in some areas also made it difficult to distinguish the Scrub Shrub (SS) Class from the Open Water Class (OW) (ex. Northern Light Lake quad) or dark flooded Emergent Class (EM) signatures.

Resolution: Used adjacent or overlapping photos with better resolution for coverage when possible (ex. north and west sections of Sawbill Camp quad). Extremely small polygons were difficult to distinguish as PSS/EM/OW, and were consequently called PEMU.

Problem 2: Difficulty in labeling linear wetlands (rivers on USGS topos).

Resolution: When a river is shown as permanent on the USGS topo and a channel can be seen on the photo, it was mapped as Riverine, even if the water itself is less than a pen width wide. This is especially the case with R30WH's, that probably have little wetland vegetation adjacent to their banks, and where a good water source is above the linear wetland. Other linear wetlands are mapped as PFOC, PSSC, etc.

Problem 3: Difficult to determine species in broad-leaved deciduous (PSS1 - alder, willow, bog birch, etc.) vs. needle-leaved evergreen (PSS3 - laborador tea, leatherleaf) scrub-shrub wetlands.

Resolution: Classify to subclass only when signature is clearly identifiable. Hydrologic system (e.g. PSS1 along streams, PSS3 in bog mats) used to help identify these subclasses when possible. Special attention to USGS topos and other sources of collateral data was necessary.

Problem 4: Some cleared forested areas difficult to distinguish as wet or dry. The height and other factors used to help distinguish upland vegetation from wetland vegetation was eliminated by logging.

Resolution: Wetland symbols and contours on USGS topos were used as an aid in determining the extent of a wetland.

Problem 5: Mapping the littoral open water zone of Laustrine System (L20W's). Water sometimes appears shallow, but may not correspond to 5-foot depth contours, when the contours are available. On Mark Lake quad, two lakes had no available 5-foot (or any) contours. While these lakes probably have a shallow L20W Zone, it does not appear as such on the photos.

Resolution: In this area, shallow waters were delineated as L20W's when visible on the photos. The 5-foot contour was not approximated.

Problem 6: Difficult to distinguish semipermanent, permanent and intermittently exposed water regimes for open water areas in the Palustrine System.

Resolution: Where Palustrine open water areas had direct input from a stream or consisted of the central zone of a bog, these were generally considered permanent (H). Semipermanent (F) and Intermittently Exposed-Permanent (Z) water regimes were used for other Palustrine open water areas.

Problem 7: Difficult to distinguish upland/wetland boundaries in forested and scrub-shrub areas where same vegetative types grow in both wet and dry locations.

Resolution: Field checks were conducted for some areas. Wetland symbols and contours on USGS topos were used whenever possible to determine the extent of a wetland. However, in certain cases (e.g. seeps), contours were ignored to some degree and the wetland should be treated as part of a hydrologic system.

Appendix C

## WETLAND COMMUNITIES

<u>MAP SYMBOLS</u>	<u>LOCAL NAME</u>	<u>DOMINANT VEGETATION</u>	<u>WATER REGIME</u>
PF04B	Swamp Bog	<u>Picea mariana</u> <u>Thuja occidentalis</u> <u>Ledum groenlandicum</u> <u>Chamaedaphne calyculata</u> <u>Larix laricina</u> <u>Abies balsamea</u>	Saturated
PF04/2B	Swamp Bog	<u>Picea mariana</u> <u>Thuja occidentalis</u> <u>Larix laricina</u> <u>Sphagnum spp.</u>	Saturated
PF04/6B	Swamp	<u>Picea mariana</u> <u>Larix laricina</u> <u>Populus tremuloides</u> <u>Abies balsamea</u>	Saturated
PF02/553B	Bog	<u>Larix laricina</u> <u>Picea mariana</u> <u>Chamaedaphne calyculata</u>	Saturated
PF01/551C	Swamp	<u>Fraxinus nigra</u> <u>Populus tremuloides</u> <u>Alnus rugosa</u> <u>Cornus stolonifera</u> <u>Salix spp.</u> <u>Prunus sp.</u>	Seasonal
PF04/551E	Swamp	<u>Picea mariana</u> <u>Larix laricina</u> <u>Alnus rugosa</u> <u>Cornus stolonifera</u>	Saturated Seasonal
PF05/EM5E	Swamp	Dead <u>Picea mariana</u> <u>Carex spp.</u> <u>Salix spp.</u> <u>Alnus rugosa</u>	Saturated Seasonal
PSS1B	Swamp	<u>Alnus rugosa</u> <u>Salix spp.</u> <u>Myrica Gale</u> <u>Prunus virginiana</u> <u>Corylus cornuta</u> <u>Thuja occidentalis</u> <u>Larix laricina</u> <u>Carex spp.</u> <u>Calamagrostis sp.</u>	Saturated

<u>MAP SYMBOLS</u>	<u>LOCAL NAME</u>	<u>DOMINANT VEGETATION</u>	<u>WATER REGIME</u>
PF04/SS1E	Swamp	<u>Picea mariana</u> <u>Larix laricina</u> <u>Alnus rugosa</u> <u>Cornus stolonifera</u>	Saturated Seasonal
PF05/EM5E	Swamp	Dead <u>Picea mariana</u> <u>Carex spp.</u> <u>Salix spp.</u> <u>Alnus rugosa</u>	Saturated
PSS1B	Swamp	<u>Alnus rugosa</u> <u>Salix spp.</u> <u>Myrica Gale</u> <u>Prunus virginiana</u> <u>Corylus cornuta</u> <u>Thuja occidentalis</u> <u>Larix laricina</u> <u>Carex spp.</u> <u>Calamagrostis sp.</u>	Saturated
PSS3B	Bog	<u>Chamaedaphne calyculata</u> <u>Myrica Gale</u> <u>Ledum groenlandicum</u>	Saturated
PSS3E	Bog	<u>Chamaedaphne calyculata</u> <u>Myrica Gale</u> <u>Ledum groenlandicum</u> <u>Kalmia polifolia</u> <u>Carex spp.</u>	Saturated Seasonal
PSS1/EM5B	Swamp	<u>Alnus rugosa</u> <u>Carex spp.</u>	Saturated
PSS3/EM5B PSS3/EM5E	Bog	<u>Chamaedaphne calyculata</u> <u>Myrica Gale</u> <u>Carex spp.</u> <u>Sarracenia purpurea</u>	Saturated Saturated Seasonal
PSS1/EM5E	Swamp	<u>Alnus rugosa</u> <u>Carex spp.</u>	Saturated Seasonal
PSS1/EM5Eb	Swamp/Beaver flooding	<u>Alnus rugosa</u> <u>Carex spp.</u>	Saturated Seasonal
PEM5B	Marsh	<u>Carex spp.</u> Misc. grasses <u>Salix spp.</u>	Saturated
PEM5Bb	Marsh/Beaver flooding	<u>Carex spp.</u> <u>Calamagrostis sp.</u> <u>Scirpus cyperinus</u> Misc. grasses	Saturated

<u>MAP SYMBOLS</u>	<u>LOCAL NAME</u>	<u>DOMINANT VEGETATION</u>	<u>WATER REGIME</u>
PEM5E	Marsh	<u>Carex</u> spp. <u>Equisetum fluviatile</u>	Saturated Seasonal
PEM5Eb	Marsh/beaver flooding	<u>Carex</u> spp. <u>Calamagrostis</u> sp. <u>Juncus</u> spp. Misc. grasses	Saturated Seasonal
PAB/OWF	Pond	<u>Nuphar</u> sp. Open water	Semi-permanent
POWH	Pond	Open water	Permanent
R20WH	River	Lower perennial open water	Permanent
R30WH	River	Upper perennial open water	Permanent
L10WH	Lake	Limnetic open water	Permanent
L2BBJ	Beach/Bar	Sand/gravel	Intermittently flooded

Appendix D

NATIONAL WETLAND INVENTORY  
Information and Legend  
For Map Products

Classification System: The U. S. Fish and Wildlife Service uses the "Classification of Wetlands and Deepwater Habitats of the United States," December, 1979, by L. M. Cowardin, et al., to delineate and identify wetlands. This system is hierarchical and structured around a combination of ecological, biological, hydrological and substrate characteristics which permits universal use across the United States, its territories and possessions. It consists of five systems: Marine, Estuarine, Riverine, Lacustrine (lake) and Palustrine (swamps, bogs, marshes); and proceeds in a hierarchical manner through subsystem, class, and subclass. It also contains provisions to use water regime, water chemistry, soil, and special modifiers to provide additional levels of detail.

Figure 1 is an illustration of the classification system to the class level.

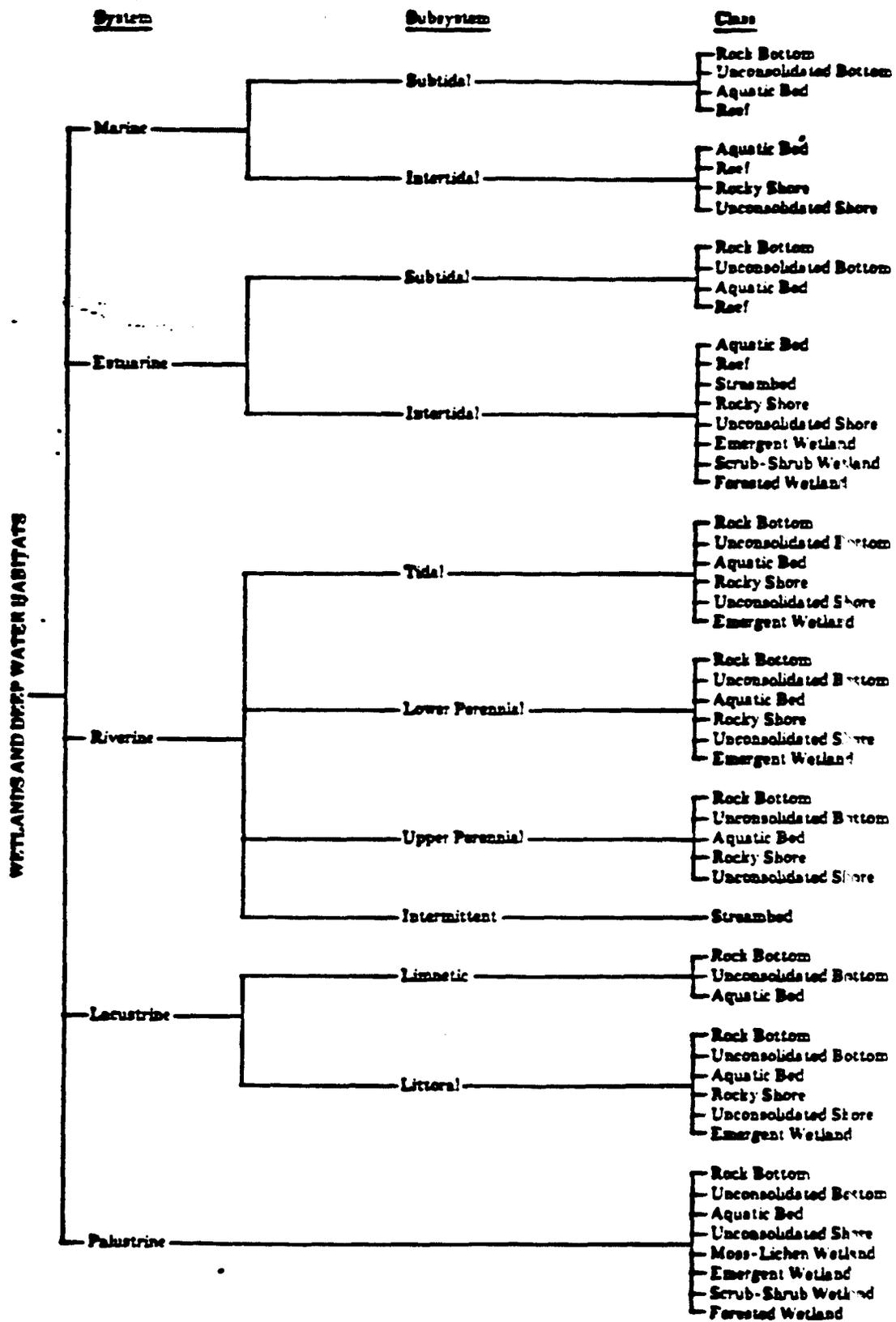


Fig 1. Classification hierarchy of wetlands and deepwater habitats, showing systems, subsystems, and classes. The Palustrine System does not include deepwater habitats.

**Use of Wetland Legend:** Wetland data are displayed on overlays or maps by a series of letters and numbers (alpha numerics) with the first letter representing the system and subsequent alpha numerics representing, in a sequential manner, the subordinate levels of detail down to the modifiers. Where classes and subclasses have been mixed, they are separated by a diagonal line.

**Examples**

**a. Classification of wetlands to water regime and special modifier:**

System:	Lacustrine
Subsystem:	Limnetic
Class:	Unconsolidated Bottom
Subclass:	Mud
Water Regime:	Intermittently Exposed
Special Modifier:	Diked/Impounded

**L 1 UB 3 G h**

**b. Mixing of wetland classes and subclasses:**

PFO2/EM1F = Palustrine, Forested, Needle-leaved deciduous (FPO2) mixed with Palustrine, Emergent, Persistent (PEM1) with semipermanent water regime (P).

System

Subsystem

M Marine

1 Subtidal

2 Intertidal

E Estuarine

1 Subtidal

2 Intertidal

P Palustrine

No Subsystem

**WETLAND LEGEND\***

R Riverine

1 Tidal

2 Lower Perennial

3 Upper Perennial

4 Intermittent

5 Unknown Perennial\*\*

L Lacustrine

1 Limnetic

2 Littoral

U Upland

\*Should be used in conjunction with "Classification of Wetlands and Deepwater Habitats of the United States," by L. M. Cowardin et al.

\*\*Not included in "Classification of Wetlands and Deepwater Habitats of the United States." Created specifically for National Wetland Inventory mapping effort.

Wetland Legend (continued)

   Class

   Subclass

CLASSES AND SUBCLASSES

- AB** Aquatic Bed
- 1 Algal
  - 2 Aquatic Moss
  - 3 Rooted Vascular
  - 4 Floating Vascular
  - 5 Unknown Submergent\*\*
  - 6 Unknown Surface\*\*

- EM** Emergent
- 1 Persistent
  - 2 Nonpersistent

- FO** Forested
- 1 Broad-Leaved Deciduous
  - 2 Needle-Leaved Deciduous
  - 3 Broad-Leaved Evergreen
  - 4 Needle-Leaved Evergreen
  - 5 Dead
  - 6 Deciduous\*\*
  - 7 Evergreen\*\*

- ML** Moss/Lichen
- 1 Moss
  - 2 Lichen

- OW** Open Water/  
Unknown Bottom\*\*

- RB** Rock Bottom
- 1 Bedrock
  - 2 Rubble

- RF** Reef
- 1 Coral
  - 2 Mollusk
  - 3 Worm

- RS** Rocky Shore
- 1 Bedrock
  - 2 Rubble

- SB** Streambed
- 1 Bedrock
  - 2 Rubble
  - 3 Cobble/Gravel
  - 4 Sand
  - 5 Mud
  - 6 Organic
  - 7 Vegetated

- SS** Scrub/Shrub
- 1 Broad-Leaved Deciduous
  - 2 Needle-Leaved Deciduous
  - 3 Broad-Leaved Evergreen
  - 4 Needle-Leaved Evergreen
  - 5 Dead
  - 6 Deciduous\*\*
  - 7 Evergreen\*\*

- UB** Unconsolidated Bottom
- 1 Cobble/Gravel
  - 2 Sand
  - 3 Mud
  - 4 Organic

- US** Unconsolidated Shore
- 1 Cobble/Gravel
  - 2 Sand
  - 3 Mud
  - 4 Organic
  - 5 Vegetated

\*\*Not included in "Classification of Wetlands and Deepwater Habitats of the United States." Created specifically for National Wetland Inventory mapping efforts.

## MODIFIERS TO WETLAND CLASSIFICATION

### WATER REGIME MODIFIERS

#### Nontidal

<b>A</b>	Temporary
<b>B</b>	Saturated
<b>C</b>	Seasonal
<b>D</b>	Seasonally Flooded-Well Drained
<b>E</b>	Seasonally Flooded-Saturated
<b>F</b>	Semipermanent
<b>G</b>	Intermittently Exposed
<b>H</b>	Permanent
<b>J</b>	Intermittently Flooded

#### Nontidal Combined

<b>Z</b>	Intermittently Exposed/ Permanent (G,H above)**
<b>W</b>	Intermittently Flooded/ Temporary (A,J above)**
<b>Y</b>	Saturated Semipermanent/ All Seasonals (B,C,D,E F above)**

#### Nontidal and Tidal

<b>U</b>	Unknown**
<b>K</b>	Artificial

#### Tidal

<b>L</b>	Subtidal
<b>M</b>	Irregularly Exposed
<b>N</b>	Regularly Flooded
<b>P</b>	Irregularly Flooded
<b>R</b>	Seasonal - Tidal
<b>S</b>	Temporary - Tidal
<b>T</b>	Semipermanent - Tidal
<b>V</b>	Permanent - Tidal

### WATER CHEMISTRY MODIFIERS

#### Coastal Salinity

<b>1</b>	Hyperhaline
<b>2</b>	Euhaline
<b>3</b>	Mixohaline (Brackish)
<b>4</b>	Polyhaline
<b>5</b>	Mesohaline
<b>6</b>	Oligohaline
<b>0</b>	Fresh

#### Inland Salinity

<b>7</b>	Hypersaline
<b>8</b>	Eusaline
<b>9</b>	Mixosaline
<b>0</b>	Fresh

#### pH Freshwater

<b>a</b>	Acid
<b>t</b>	Circumneutral
<b>l</b>	Alkaline

\*\*Not included in "Classification of Wetlands and Deepwater Habitats of the United States." Created specifically for National Wetland Inventory mapping effort.

## OTHER MODIFIERS

### Special

b	Beaver
d	Partially Drained/ Ditched
f	Farmed
h	Diked/Impounded
i	Artificial
s	Spoil
x	Excavated

### Soils

g	Organic
n	Mineral

**Statement to Users:** The overlays/maps were prepared primarily by stereoscopic analysis of high altitude aerial photographs. Wetlands were identified on the photographs based on vegetation, visible hydrology, and geography in accordance with "Classification of Wetlands and Deepwater Habitats of the United States." The aerial photographs typically reflect 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 a 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 on this map. Federal, State, and local regulatory agencies with jurisdictions 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 the limits of proprietary jurisdiction of any Federal, State, or local government or to establish the geographical scope of the regulatory programs and proprietary jurisdictions that may affect such activities.

**To Order NWI Topical Wetland Overlays/Maps:** A National Wetland Inventory Order Form is required and can be obtained by writing to the address on the letterhead.

