

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

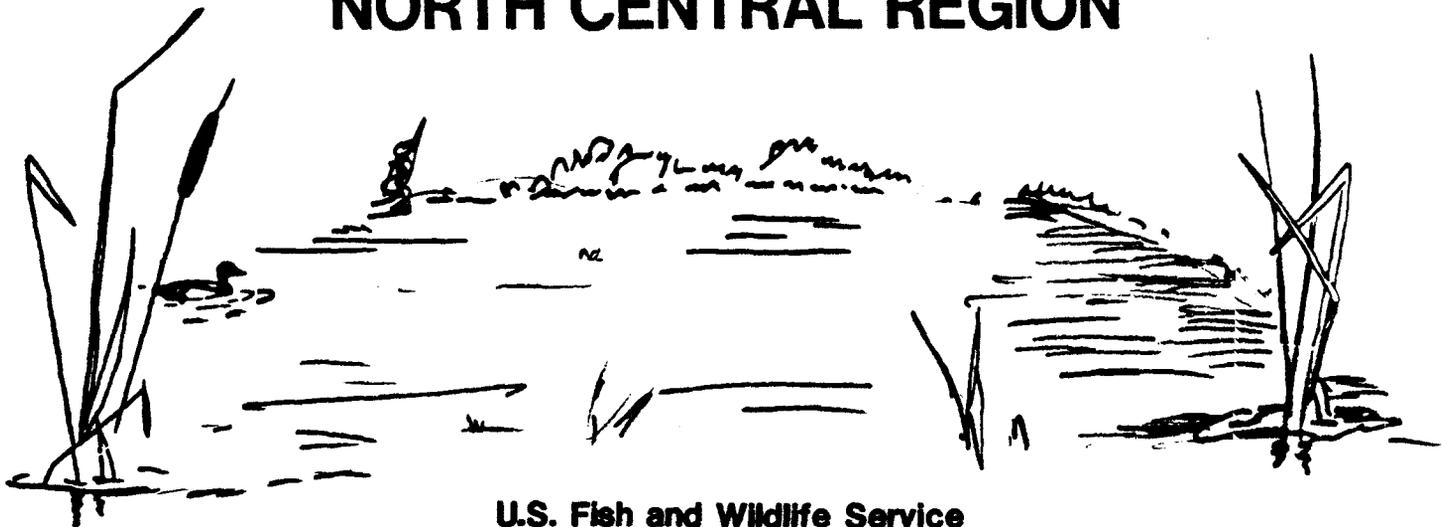
**MAP AREA:** THUNDER BAY SE

**1:100,000 NAME:** N/A

**STATE:** MICHIGAN



## NORTH CENTRAL REGION



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

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

### USER CAUTION

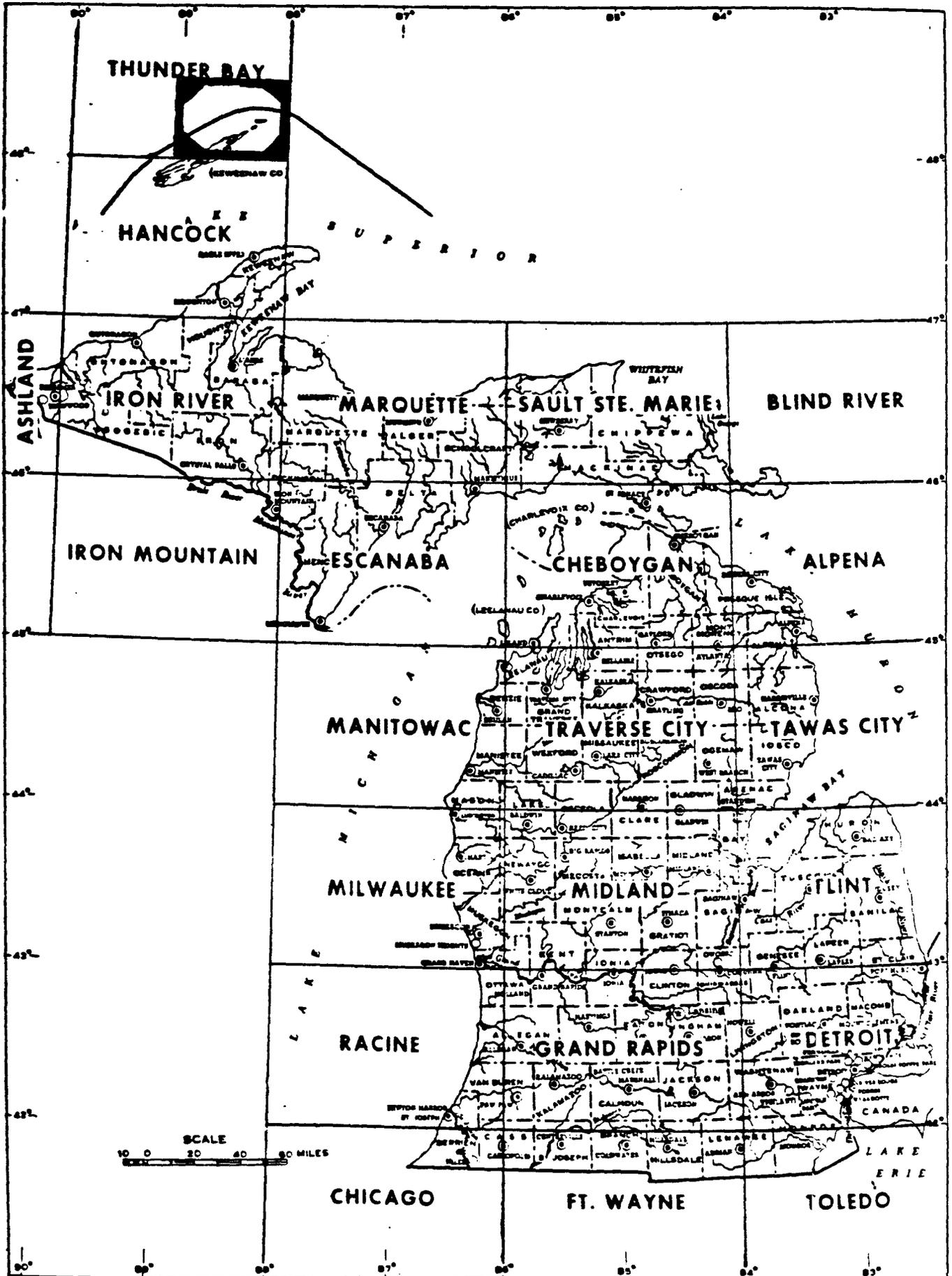
Maps for this 1:100,000 scale map were prepared primarily by stereoscopic analysis of high altitude aerial photographs. Wetlands were identified on the photographs based on vegetation, visible hydrology, and geography in accordance with Classification of Wetlands and Deepwater Habitats of the United 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

Michigan Dept. of Natural Resources  
Land Resources Program  
Box 30028  
Lansing, Michigan 48909



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	October 1978	100%

Field Check Dates:

1. None

Contractor(s) for Photo Interpretation:

1. Michigan Dept. of Natural Resources

Collateral Data Used:

1. USGS topographic quad sheets
2. USDA Soil Surveys

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: 88° 0' to 89° 0' West

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

Thunder Bay SE covers the northeastern-half of Isle Royale, which is located in Lake Superior, just east of Grand Portage, Minnesota. Isle Royale, including the Thunder Bay SE map area, lies within the Lake Superior watershed, and includes a portion of Keweenaw County, Michigan. Isle Royale is a National Park.

B. Ecoregion

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

Code: 2111L

Humid Temperate Domain (2000)

The entire Thunder Bay SE 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 Thunder Bay SE map area 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 Thunder Bay SE map 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 (2111L)

This Section occurs in lowlands, and includes all of the Thunder Bay SE map area.

Spruces (Picea spp.) and firs (Abies spp.) are the predominant tree species of this Section.

C. Topography and Land Forms

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

Codes: (III-3) C4a

Interior Physical Division (III) - This Physical Division covers all of the Thunder Bay SE map area.

North-Central Lake-Swamp-Moraine Plains Subdivision (3) - All of the Thunder Bay SE map lies within this Subdivision.

Open Hills and Mountains Class (C4a) - This Class includes the entire Thunder Bay SE map area. Twenty to 50% of the land is in gentle slopes. More than 75% of the gentle slopes are in lowlands.

RESOURCES

A. Wetlands

No wetland acreage figure is available for the Thunder Bay SE area at the present time.

A list of wetland plant communities, local names, typical water regimes and associated mapping symbols is included in Appendix C.

B. Wildlife and Fish

Several species of wildlife inhabit Isle Royal, which includes the Thunder Bay SE map area. Common mammals include moose (Alces alces), red foxes (Vulpes vulpes), coyotes (Canis latrans), beavers (Castor canadensis) and snowshoe hares (Lepus americanus). Timber wolves (Canis lupus), on the Endangered and Threatened list, are found on the island.

Permanent avian residents include blue jays (Cyanocitta cristata), gray jays (Perisoreus canadensis), hairy and downy woodpeckers (Dendrocopus spp.), black-capped chickadees (Parus atricapillus) and red-breasted nuthatches (Sitta canadensis).

Black ducks (Anas rubripes), common goldeneyes (Bucephala clangula) and mergansers (Mergus spp.) utilize the island during the summer. Migrant waterfowl species include common goldeneyes, buffleheads (A. albeola), scaup (Aythya spp.), ring-necked ducks (A. collaris), old

squaws (Clangula hyemalis) and white-winged scoters (Melanitta deglandi). Habitat for waterfowl consists of inland lakes, beaver ponds, Lake Superior shoreline and Lake Superior itself (Hansen et al. 1973, Herdendorf et al. 1981, Panzer 1955).

Warblers, herring gulls (Larus argentatus) and spotted sandpipers (Actitis macularia) are abundant during the summer months. Common migrants include the common loon (Gavia immer) and several hawk species.

Sport fishing opportunities are available in inland lakes and streams, and in Lake Superior. Commercial fishing is limited to Lake Superior.

Common fish species of the island include rainbow trout (Salmo gairdneri), brown trout (S. trutta), brook trout (Salvelinus fontinalis), yellow perch (Perca flavescens), northern pike (Esox lucius), white suckers (Catostomus commersoni) and walleyes (Stizostedion vitreum vitreum). Lake Superior sport fish include lake trout (Salvelinus namaycusch), rainbow trout, coho salmon (Oncorhynchus kisutch) and chinook salmon (O. tshawytscha). Lake herring (Coregonus artedii), lake whitefish (C. clupeaformis), chubs (Semotilus) and lake trout dominate the commercial catch (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.
- 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.
- Hansen, H.L., L.W. Krefting, and V.K. Kurmis. 1973. The Forest of Isle Royale in Relation to Fire History and Wildlife. Univ. of Minn., Agricultural Exp. Station. Tech Bull. No. 294, Forest Series B. 43 p.
- 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-v6. p. 790-807.
- Panzer, E.R. 1955. Wetlands Inventory of Michigan. U.S. Fish and Wildlife Service, Office of River Basin Studies. Minneapolis, Minn. 19 p.

ADDITIONAL INFORMATION

The purpose of this report is to provide general information regarding the production of the map and the 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. pp. 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-v6. 846 p.

Peter Jordan of the University of Minnesota has done much work on the vegetation, soils and wildlife of Isle Royale.

Appendix B

SPECIAL MAPPING PROBLEMS

Problem 1: It was difficult to delineate the L2 zone around Isle Royale and numerous small islands in Lake Superior; in many cases the L2 zone was omitted.

Resolution: Use of NOAA sounding charts as collateral data.

Problem 2: It was often difficult to accurately identify specific water regimes from the 1:80,000 black and white photography.

Resolution: Combined water regimes (Z,W,Y) were used where necessary.

Appendix C

## WETLAND COMMUNITIES

<u>MAP SYMBOLS</u>	<u>LOCAL NAME</u>	<u>DOMINANT VEGETATION</u>	<u>WATER REGIME</u>
PFOB PFOY	Swamp	<u>Fraxinus nigra</u> <u>Thuja occidentalis</u> <u>Picea mariana</u> <u>Abies balsamea</u>	Saturated Seasonal
PFO2B	Swamp	<u>Larix laricina</u> <u>Thuja occidentalis</u>	Saturated
PFO4B	Cedar swamp	<u>Thuja occidentalis</u> <u>Picea mariana</u>	Saturated
PFO4/1B	Swamp	<u>Thuja occidentalis</u> <u>Picea mariana</u> <u>Tsuga canadensis</u> <u>Fraxinus nigra</u> <u>Betula papyrifera</u>	Saturated Seasonal
PFO/SSB PFO/SSY	Swamp	<u>Thuja occidentalis</u> <u>Tsuga canadensis</u> <u>Abies balsamea</u> <u>Alnus rugosa</u> <u>Salix sp.</u>	Saturated Seasonal
PFO5/EMY	Swamp	Dead <u>Ulmus sp.</u> <u>Picea sp.</u> <u>Carex spp.</u> <u>Juncus sp.</u>	Seasonal
PSSB	Bog	<u>Chamaedaphne calyculata</u> <u>Ledum groenlandicum</u>	Saturated
PSSY	Swamp	<u>Alnus rugosa</u> <u>Salix sp.</u> <u>Cornus sp.</u>	Saturated Seasonal
PSSY	Bog	<u>Kalmia polifolia</u>	Saturated
PSS/EMB	Swamp Bog	<u>Chamaedaphne calyculata</u> <u>Carex spp.</u> <u>Juncus spp.</u>	Saturated
PSS/EMY	Swamp	<u>Salix sp.</u> <u>Alnus sp.</u> <u>Carex spp.</u> <u>Juncus spp.</u> Misc. grasses	Saturated Seasonal Semi-permanent

<u>MAP SYMBOLS</u>	<u>LOCAL NAME</u>	<u>DOMINANT VEGETATION</u>	<u>WATER REGIME</u>
PEMB	Wet meadow	<u>Carex spp.</u> <u>Misc. grasses</u>	Saturated
PEMY	Marsh	<u>Typha latifolia</u> <u>Eriophorum sp.</u> <u>Scirpus sp.</u> <u>Carex spp.</u>	Saturated Seasonal Semi-permanent
POWZb	Beaver flooding	Open water	Intermittently exposed Permanent

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.

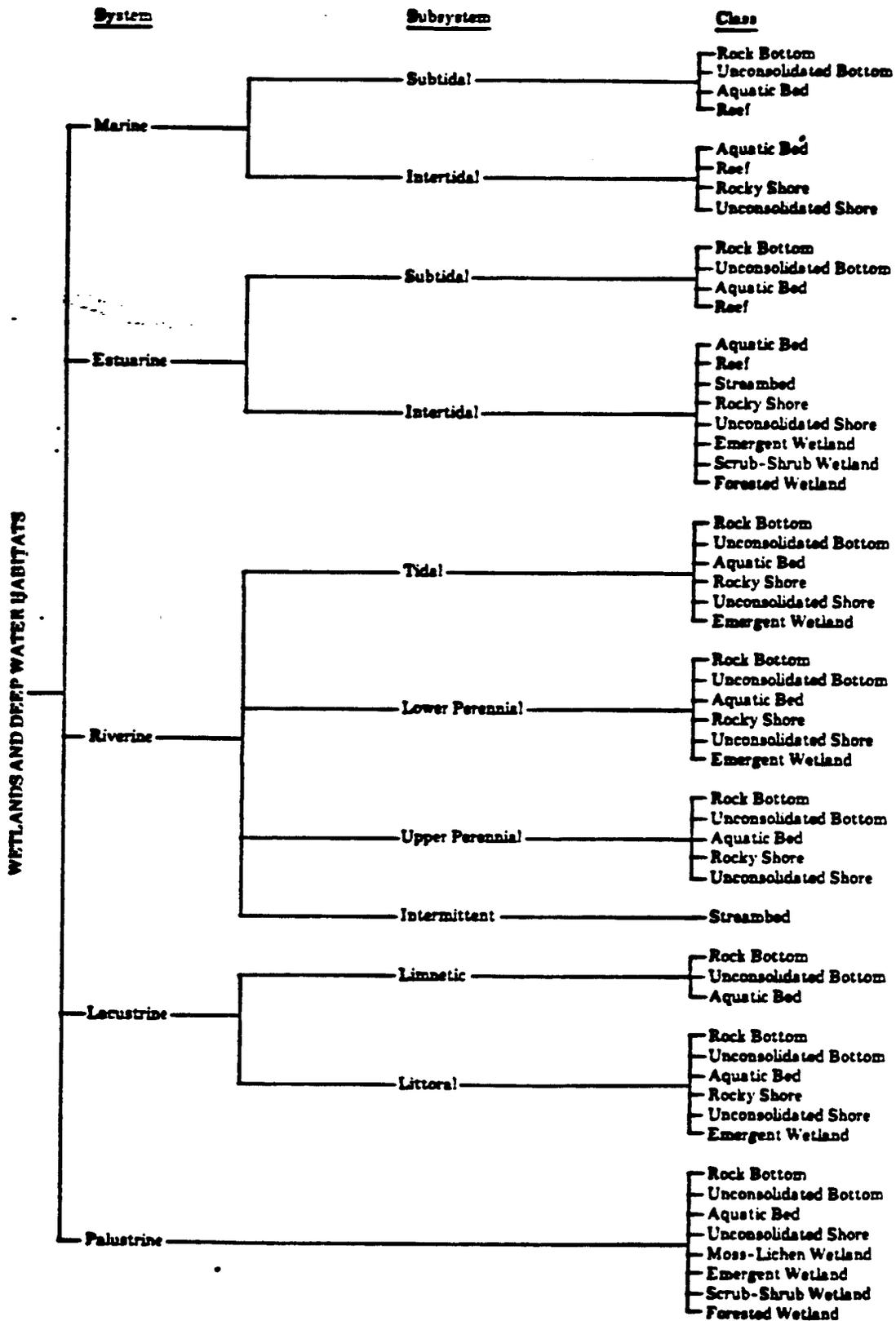


Fig. 1. Classification hierarchy of wetlands and deepwater habitats, showing systems, subsystems, and classes. The Palustrine System does not include deepwater habitats.

**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**

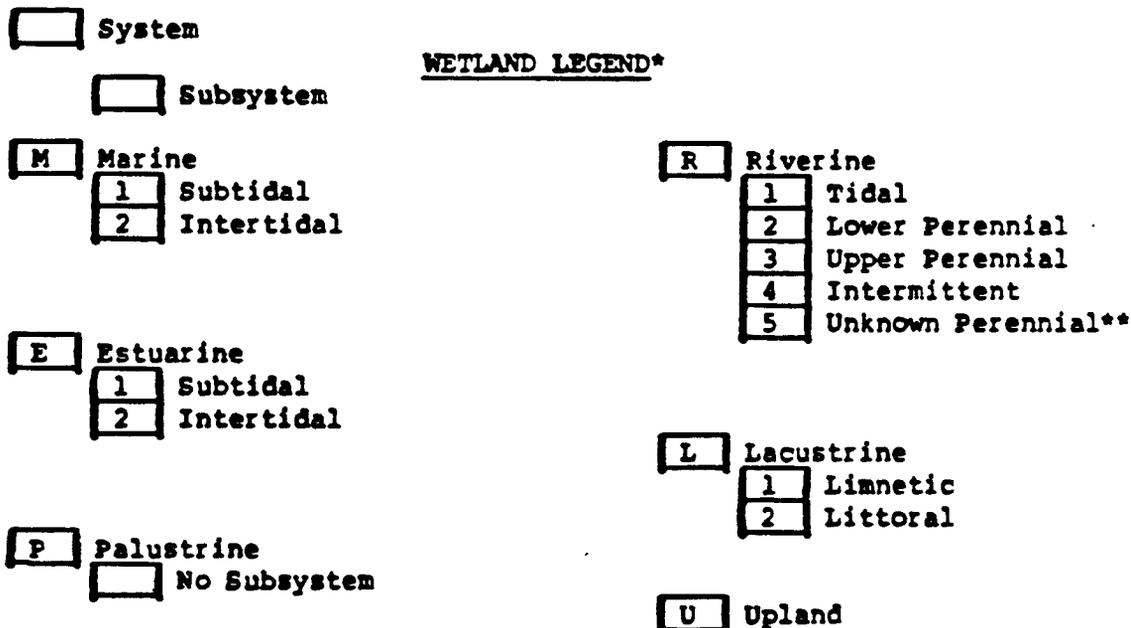
**a. Classification of wetlands to water regime and special modifier:**

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 (PFO2) mixed with Palustrine, Emergent, Persistent (PEM1) with semipermanent water regime (F).



\*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.

## OTHER MODIFIERS

### Special

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

### Soils

<b>g</b>	Organic
<b>n</b>	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.

