

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

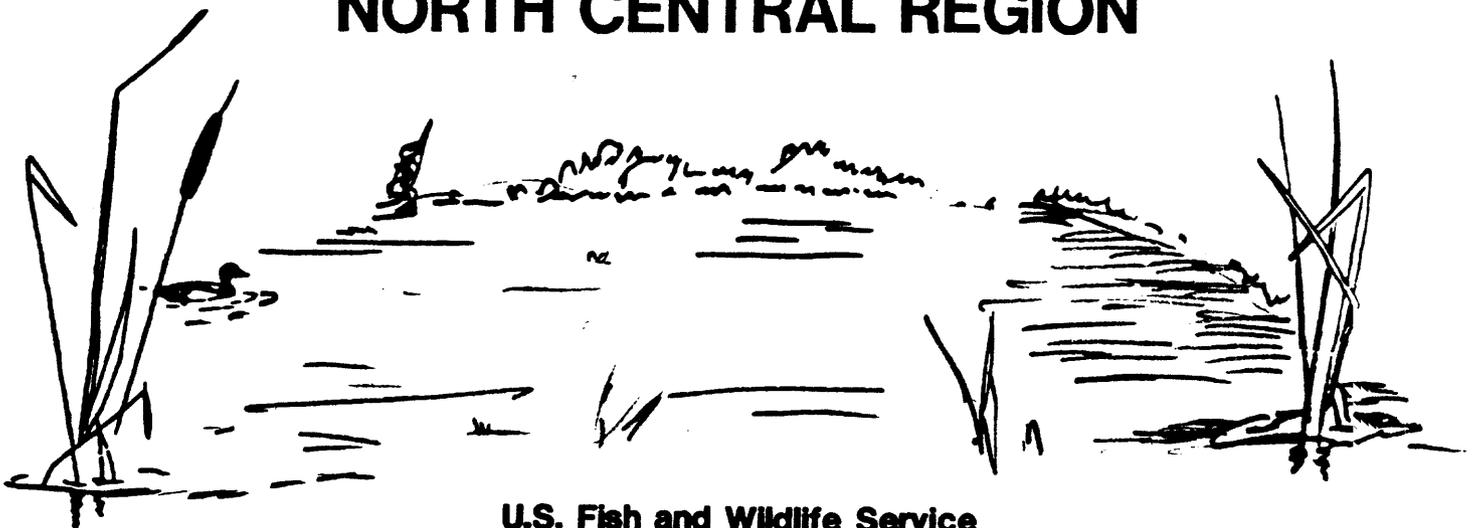
MAP AREA: SAULT SAINTE MARIE SE

1:100,000 NAME: SAULT SAINTE MARIE
SOUTH

STATE: MICHIGAN



NORTH CENTRAL REGION



U.S. Fish and Wildlife Service

Federal Building, Fort Snelling Twin Cities, Minnesota 55111

**USER REPORT
NATIONAL WETLAND INVENTORY
U.S. FISH AND WILDLIFE SERVICE
REGION 3**



PREPARED BY

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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.

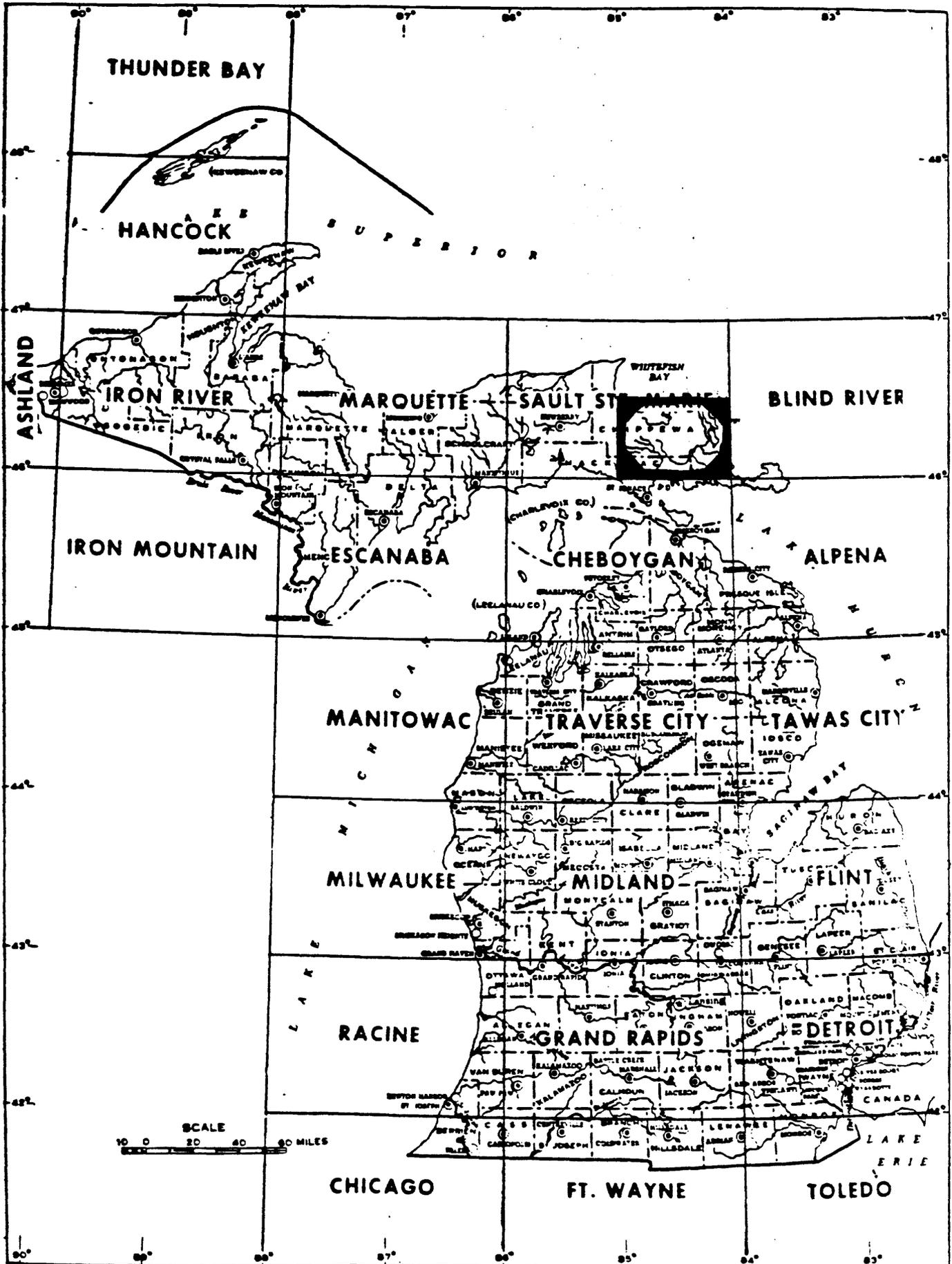
Federal, State, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either design or products of this inventory, to define limits of proprietary jurisdiction of any local, State, 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

LOCATION OF REPORT
STATE OF MICHIGAN



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 1980	100%

Field Check Dates:

1. August 25 - 27, 1981

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: 84° 0' to 85° 0' West

Degrees Latitude : 46° 0' to 46° 30' North

Largest City : Sault Sainte Marie, Michigan

Sault Sainte Marie SE is located in the extreme eastern part of Michigan's upper peninsula, and encompasses portions of Chippewa and Mackinac Counties. The map area is bordered on the northwest by Lake Superior, and on the northeast by St. Marys River, Lake George, and the Canadian border. St. Martin Bay of Lake Huron is found in the extreme south-central portion of the map. This map lies within Big Munuscong, Pine, Carp, and Tahquamenon River drainage basins, and Lake Michigan, Lake Huron and Lake Superior watersheds. Hiawatha National Forest covers a portion of the map area.

B. Ecoregion

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

Code: 2212L

Humid Temperate Domain (2000)

The entire Sault Sainte Marie 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 Sault Sainte Marie 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 Sault Sainte Marie 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.

Northern Hardwoods-Fir Forest Section (2112L)

This Section occurs in lowland, and includes all of the Sault Sainte Marie SE map area.

Hardwoods 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) A2b, (III-3) B2b

Interior Physical Division (III) - This Physical Division covers all of the Sault Sainte Marie SE map area.

North-Central Lake-Swamp-Moraine Plains (3) - All of Sault Sainte Marie SE map lies within this Subdivision.

Smooth Plains Class (A2c) - This Class includes the northern two-thirds of the Sault Sainte Marie SE map area, where over 80% of the land is gently sloping. Fifty to 75% of these slopes occur in lowlands. Local relief ranges from 100 to 300 feet.

Irregular Plains Class (B2b) - The southern third of the Sault Sainte Marie SE map area is covered by this Class. Fifty to 80% of the land is in gentle slopes. Fifty to 75% of these slopes are found in lowlands. Local relief ranges from 100 to 300 feet.

RESOURCES

A. Wetlands

No wetland acreage figure is available for the Sault Sainte Marie 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 waterfowl inhabit the area, including scaups (Aythya spp.), canvasbacks (A. valisineria), redheads (A. americana), ring-necked ducks (A. collaris), mallards (Anas platyrhynchos), black ducks (Anas rubripes), wood ducks (Aix sponsa), goldeneyes (Bucephala clangula), buffleheads (B. albeola), old squaws (Clangula hyemalis), Canada geese (Branta canadensis), and whistling swans (Olor columbianus). The St. Marys River system, which includes Lake Nicolet and Munuscong Lake, is particularly important for waterfowl migration. Munuscong Lake is also important for waterfowl production, as are wooded wetlands flooded by beaver (Great Lakes Basin Commission 1975b, Panzner 1955, Rounds 1956).

Several species of wildlife on the Endangered and Threatened list occur in the map area. Habitat loss and competition for nest usage by the brown-headed cowbird (Molothrus ater) have been the reasons for the decline of Kirtland's warblers (Dendroica kirtlandii). Bald eagles (Haliaeetus leucocephalus) and peregrine falcons (Falco peregrinus) have also decreased in numbers, primarily because of reproductive failure attributed to the use of pesticides. However, Madsen et al. 1982 report that bald eagle production in Michigan showed an overall increase during the period 1973 - 1981.

While some forest wildlife species in the map area have declined due to decreased diversity of the habitat, furbearers, including beaver (Castor canadensis), muskrats (Ondatra zibethica), raccoons (Procyon lotor), weasles (Mustela spp.) and mink (M. vison) have maintained relatively stable populations. Pine martens (Martes americana) and fishers (Martes pennanti), which were once wiped out by overharvesting and logging, have been reintroduced into Michigan's upper peninsula. Canada lynx (Lynx canadensis) are also making a comeback. Other wildlife species of Sault Sainte Marie SE include black bears (Ursus americanus), snowshoe hares (Lepus americanus), eastern cottontails (Sylvilagus floridanus), squirrels (Sciurus sp.) and ruffed grouse (Bonasa umbellus).

Sport fishing opportunities are available in inland lakes and streams. Both sport and commercial fishing opportunities are available in Lakes Huron, Michigan and Superior. Common fish species of inland lakes and mainstream portions of rivers include smallmouth bass (Micropterus dolomieu), rock bass (Ambloplitis rupestris), yellow perch (Perca flavescens), northern pike (Esox lucius), muskellunge (E. masquinongy) and walleyes (Stizostedion vitreum vitreum). Stream species include largemouth bass (M. salmoides), bluegills (Lepomis macrochirus), brook trout (Salvelinus fontinalis), brown trout (Salmo trutta), rainbow trout (Salmo gairdneri), suckers (Catostomus), rainbow smelt (Osmerus mordax), walleyes, coho salmon (Oncorhynchus kisutch) and chinook salmon (O. tshawutskia).

Lake trout (Salvelinus namaycush), rainbow trout, coho and chinook salmon, northern pike, walleyes, and smallmouth bass are the most common sport fish of the Great Lakes. Commercial fish species include

lake whitefish (Coregonus clupeaformis), lake herring (C. artedii), chubs (Semotilus), catfish (Ictalurus sp.), carp (Cyprinus carpio), smelt, and alewife (Alosa pseudoharengus) (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 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.
- Madsen, C.R., T.J. Sheldrake, and J.T. Leach, eds. 1982. Bald Eagle Production in the Great Lakes States 1973 - 1981. U.S. Fish and Wildlife Service, Reg. 3. Twin Cities, Minn. p.
- Panzer, E.R. 1955. Wetlands Inventory of Michigan. U.S. Fish and Wildlife Service, Office of River Basin Studies. Minneapolis, Minn. 19 p.
- Rounds, B.W. 1956. Inventory of Permanent Water Habitat Significant to Waterfowl in Michigan. U.S. Fish and Wildlife Service, Office of River Basin Studies. Minneapolis, Minn. 10 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 four: Lake Huron. U.S. Fish and Wildlife Service, Washington, D.C. FWS/OBS-81/02-v4. 792 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 five: Lake Michigan. U.S. Fish and Wildlife Service, Washington, D.C. FWS/OBS-81/02-v5. 1592 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. 846 p.

Appendix B

SPECIAL MAPPING PROBLEMS

Problem 1: Some PSS/EM areas appeared very light on the photos and were mistakenly labeled PEM. Field checking revealed leatherleaf (Chamaedaphne calyculata) to be present in a number of cases.

Resolution: Photos were carefully checked for subtle tone and texture differences. The signature of these low shrubs needed to be learned. The configuration of a typical bog type wetland was also helpful.

Problem 2: High water conditions of the Great Lakes change the delineation of many shoreline features (i.e., islands indicated by USGS topo maps, flats, emergents, etc.).

Resolution: Water levels in the Great Lakes are subject to change. Users should be aware of this fact, and realize that what and how many shoreline features are mapped depends on the water level at the time of photography.

Problem 3: An arbitrary break exists between Munuscong Lake (L10WH) and the St. Marys River (RZ0WH).

Resolution: Because of the subjectivity involved, the break was not determined.

Problem 4: Some forested areas appeared similar to PFO4 or PFO4/1 wetlands, and contained many of the same plant species (e.g. hemlock, balsam fir, cedar, birch, aspen).

Resolution: Topographic maps were checked carefully. Soil borings showed these areas to have somewhat poorly drained clay soils and not considered wetland. Photos were checked for subtle tone and texture differences. However, delineation problems still occur in this map area for species which grow on both upland and wetland sites.

Problem 5: It was at times difficult to distinguish between agricultural fields and those supporting wetland vegetation.

Resolution: This area has very heavy, somewhat poorly drained clay soils. It was very difficult to tell whether or not an agricultural field was a wetland if it had been plowed within the previous two years of the photo. Wetland delineations were conservative for these areas.

Problem 6: 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>
PFO4B PFO4Y	Swamp	<u>Thuja occidentalis</u> <u>Tsuga canadensis</u> <u>Picea mariana</u> <u>Abies balsamea</u>	Saturated Seasonal
PFO4/1B PFO4/1Y	Swamp	<u>Thuja occidentalis</u> <u>Tsuga canadensis</u> <u>Abies balsamea</u> <u>Populus sp.</u> <u>Betula papyrifera</u> <u>Fraxinus nigra</u>	Saturated Seasonal
PFOB PFOY	Swamp	<u>Abies balsamea</u> <u>Tsuga canadensis</u> <u>Betula papyrifera</u> <u>Thuja occidentalis</u>	Saturated Seasonal
PFO1B PFO1/4B PFO1Y PFO1/4Y	Swamp	<u>Fraxinus nigra</u> <u>Acer rubrum</u> <u>Populus sp.</u> <u>Abies balsamea</u>	Saturated Seasonal
PFO/SSB PFO/SSY	Swamp	<u>Tsuga canadensis</u> <u>Picea mariana</u> <u>Populus sp.</u> <u>Betula sp.</u> <u>Alnus sp.</u>	Saturated Seasonal
PFO5/EMY	Swamp	Dead <u>Ulmus sp.</u> <u>Tsuga canadensis</u> <u>Populus sp.</u> <u>Juncus sp.</u> <u>Carex sp.</u> <u>Typha latifolia</u>	Seasonal Semi-permanent
PSSB PSS3B PSSY	Bog	<u>Chamaedaphne calyculata</u> <u>Ledum groenlandium</u>	Saturated
PSSB PSS1B PSSY PSS1Y	Swamp	<u>Alnus rugosa</u> <u>Salix sp.</u> <u>Cornus stolonifera</u>	Saturated Seasonal
PSS/EMB	Bog	<u>Chamaedaphne calyculata</u> Misc. grasses and sedges	Saturated

<u>MAP SYMBOLS</u>	<u>LOCAL NAME</u>	<u>DOMINANT VEGETATION</u>	<u>WATER REGIME</u>
PSS/EMY	Swamp	<u>Alnus rugosa</u> <u>Salix sp.</u> <u>Cornus sp.</u> Misc. grasses and sedges	Saturated Seasonal
PEMB	Wet meadow	<u>Carex sp.</u> <u>Juncus spp.</u> Misc. grasses	Saturated
PEMY	Marsh	<u>Carex sp.</u> <u>Juncus sp.</u> <u>Eriophorum sp.</u>	Seasonal Semi-permanent
PABH	Pond	<u>Nuphar sp.</u> <u>Lemna sp.</u>	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.

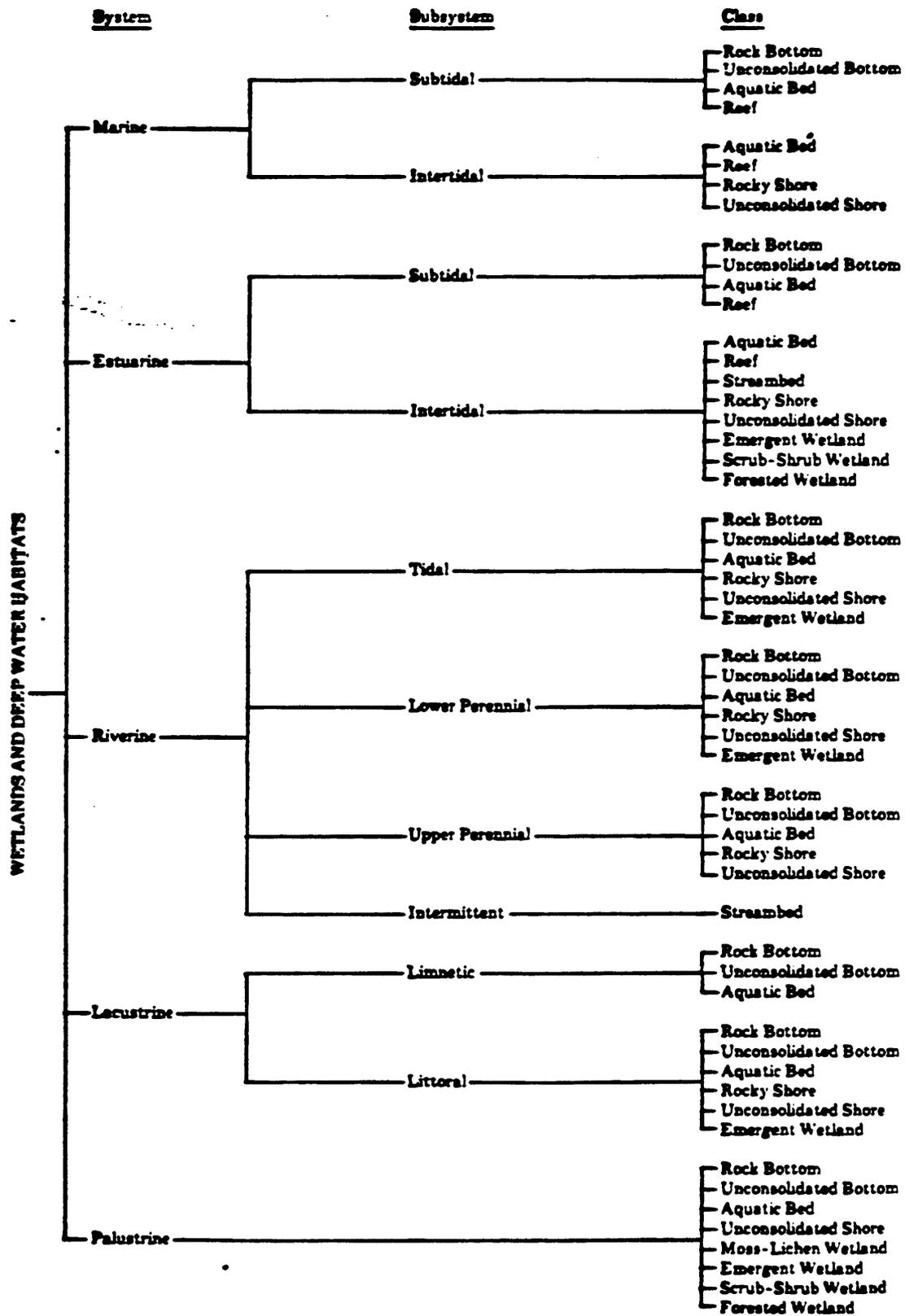


Fig. 1. Classification hierarchy of wetlands and deepwater habitats, showing systems, subsystems, and classes. The Palustrine System does not include deepwater habitats.

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

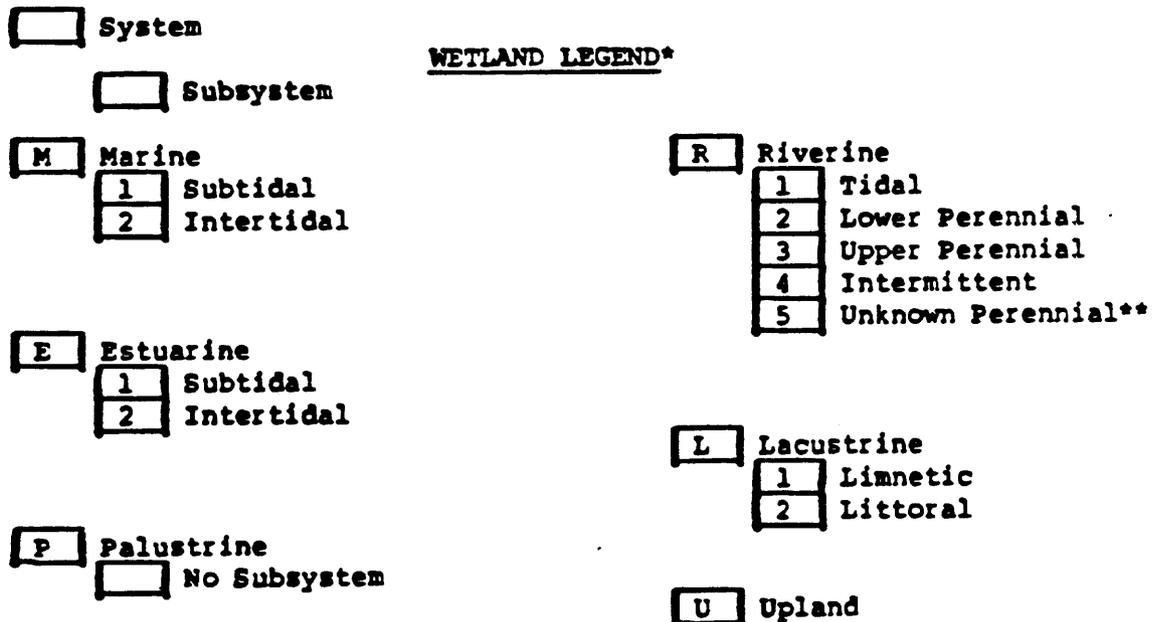
a. Classification of wetlands to water regime and special modifier:

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.

MODIFIERS TO WETLAND CLASSIFICATION

WATER REGIME MODIFIERS

Nontidal

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

Nontidal Combined

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

Nontidal and Tidal

D	Unknown**
K	Artificial

Tidal

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

WATER CHEMISTRY MODIFIERS

Coastal Halinity

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

Inland Salinity

7	Hypersaline
8	Eusaline
9	Mixosaline
0	Fresh

pH Freshwater

a	Acid
t	Circumneutral
l	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
r	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.

