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

MAP AREA: FLINT SE

1:100,000 NAME: CROSWELL

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

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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)
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Federal Building, Fort Snelling
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GEOGRAPHY

A. General Location

Degrees Longitude: 82° 0' to 83° 0' West

Degrees Latitude : 43° 0' to 43° 30' North

Largest City : Port Huron, Michigan

Flint SE is located in the 'Thumb' area of Michigan southeast of Saginaw Bay. The map is bordered on the east by Lake Huron and encompasses portions of Sanilac and St. Clair Counties. This map lies within the Lake Huron watershed and Black and Cass River drainage basins.

B. Ecoregion

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

Code: 2113L, 2212L

Humid Temperate Domain (2000)
The entire Flint 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)
This Division covers two-thirds of the map area, extending from the east-central and northeastern portions to the northwestern portion.

This Division characteristically has warm summers and cold, snowy winters. The natural vegetation is needleleaf and mixed needleleaf-decidous 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.

Hot Continental Division (2200)
One-third of the map area lies within this Division extending from the west-central to the southeastern part of the map and including all of the southwestern portion.

This Division characteristically has hot summers and cool winters. The natural vegetation is winter deciduous forest, where tall broadleaf trees dominate. These trees form a dense canopy in the summer, but lose their leaves in the winter. The shrub layer is weakly developed. A lush herbaceous layer develops in early spring,

but diminishes as the dense tree canopy forms and shades the ground. Soils are primarily Alfisols, Inceptisols and Ultisols which are rich in humus and moderately leached.

Laurentian Mixed Forest Province (2110)
This Province includes two-thirds of Flint SE, extending from the east-central to the northwestern part of the map and including all of the northeastern portions.

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.

Eastern Deciduous Forest Province (2210)
This Province covers one-third of the map area, extending from the west-central and southwestern portions to the southeastern portion.

The vegetation of this Province represents a response to a climate that receives adequate precipitation all year long. Common tree species of the deciduous forests include beech (*Fagus grandifolia*), oak (*Quercus* spp.), birch (*Betula* spp.), basswood (*Tilia americana*), elm (*Ulmus* spp.), maple (*Acer* spp.) and ash (*Fraxinus* spp.). Pines develop quickly in forests cleared for logging.

Tree species of poorly drained forests consist of alder (*Alnus* spp.), willow (*Salix* spp.), ash and elm.

Northern Hardwood Forest Section (2113L)
This Section occurs in lowland areas and covers two-thirds of the map area, extending from the east-central part to northwestern part of the map and including the entire northeastern portion.

Hardwoods are the most common tree species of this Section.

Beech-Maple Forest Section (2212L)
This Section occurs in lowland areas, and covers a third of the map area, extending from the west-central and southwestern portions to the southeastern portion.

Beech and maple 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-2) A1, (III-2) A2b

Interior Physical Division (III) - The entire Flint SE map lies within this Physical Division.

East-Central Drift and Lake-bed Flats Subdivision (2) - This Subdivision covers all of the Flint SE map area.

Flat Plains Class (A1) - This Class includes the southeast 10% of the map area, where over 80% of the land is in gentle slopes of less than 100 feet.

Smooth Plains Class (A2b) - This Class covers all but the southeast 10% of the map area. More than 80% of the land is in gentle slopes. Fifty to 75% of these slopes occur in lowlands. Local relief ranges from 100 to 300 feet.

RESOURCES

A. Wetlands

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

Wetland losses in the Flint SE area have been attributed mainly to agricultural drainage and industrial development (Panzner 1955). However, the map area still contains a good density of wetlands. These wetlands are generally well distributed throughout the map area, with a slightly higher concentration found in the southwest.

The wetlands which remain in the Flint SE map area occur in uplands and in river floodplains and are primarily forested, scrub-shrub, forested/scrub-shrub, scrub-shrub, and scrub-shrub/emergent wetlands that are either saturated or seasonally flooded. Predominant trees and shrubs of the forested and forested/scrub-shrub wetlands include red maple (*Acer rubrum*), silver maple (*A. saccharinum*), ash (*Fraxinus* spp.) quaking aspen (*Populus tremuloides*) and willow (*Salix* spp.). Willow, dogwood (*Cornus* sp.) and alder (*Alnus* spp.) are the most common shrubs of the scrub-shrub wetlands. Plant species which dominate the scrub-shrub/emergent wetlands include dogwood, willow, cattail (*Typha latifolia*) and reed canary grass (*Phalaris arundinacea*). A list of plant species for wetland types can be found in Appendix C.

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.

Panzer, E.R. 1955. Wetland 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.

Herdenfdorf, 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.

Appendix B

SPECIAL MAPPING PROBLEMS

Problem 1: It was at times difficult to distinguish between upland shrubs (oak, sumac) and wetland shrubs.

Resolution: Use of USDA Soil Surveys as collateral data. Close attention was paid to photo signatures.

Problem 2: Extensive draining for agriculture made it difficult to distinguish upland forested areas from PFOY's.

Resolution: USDA Soil Surveys were used as collateral data. Field checking was done when possible.

Problem 3: Much of the area is undergoing rapid development. Many wetlands are being filled for housing and industry.

Resolution: Because of extensive drainage and the dynamic nature of the area, some areas shown as wetland on USGS topos are not visible on the photos. Users should be aware of changing wetland conditions.

Problem 4: Delineation problems along Black River.

Resolution: N/A

Problem 5: 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

MAP SYMBOLS	LOCAL NAME	DOMINANT VEGETATION	WATER REGIME
PFOB PFOY PFO1Y	Lowland hardwoods Swamp	*Acer rubrum* *Acer saccharinum* *Fraxinus* spp.	Saturated Seasonal
PFO/SSY	Swamp	*Acer rubrum* *Fraxinus* spp. *Populus tremuloides* *Salix* spp.	Saturated Seasonal
PSSY PSS1Y	Swamp	*Alnus* spp. *Cornus* spp. *Salix* spp.	Saturated Seasonal Semi-permanent
PSS/EMY	Swamp	*Alnus* spp. *Salix* spp. *Typha latifolia* *Phalaris arundinacea*	Saturated Seasonal Semi-permanent
PEMY	Wet meadow	*Juncus* spp. *Carex* spp. *Phalaris arundinacea*	Saturated Seasonal
PEMY	Marsh	*Typha latifolia* *Phragmites* sp.	Seasonal Semi-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.

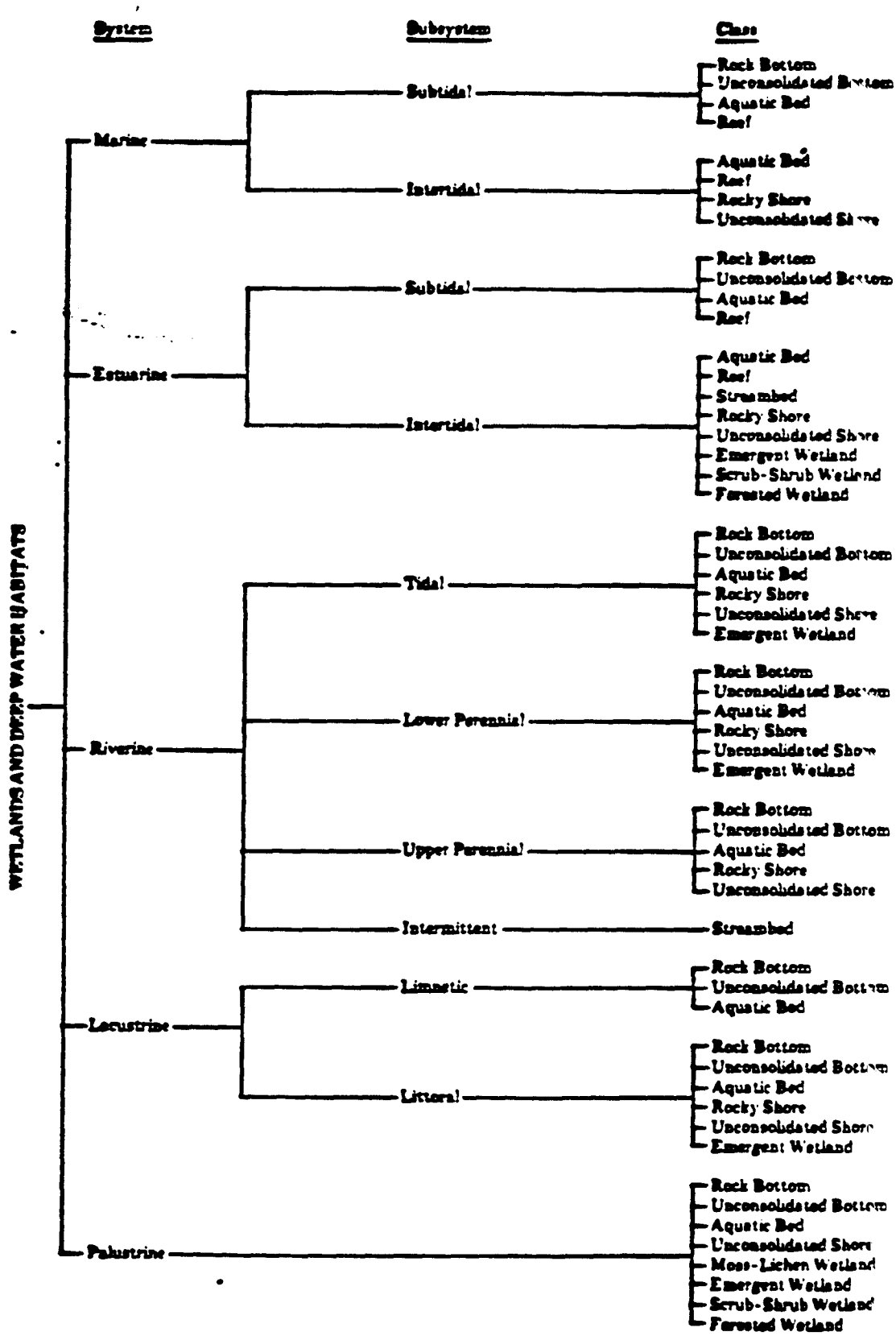

Fig 1. Classification hierarchy of wetlands and deepwater habitats, showing systems, subsystems, and classes The Palustrine System does not include deepwater habitats

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).

[ ] System

[ ] Subsystem

WETLAND LEGEND*

[M] Marine
- [1] Subtidal
- [2] Intertidal

[E] Estuarine
- [1] Subtidal
- [2] Intertidal

[P] Palustrine
- [ ] No Subsystem

[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 Decidous
- [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/Gr
- [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

- U 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 Salinity

- 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

- q 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 additon, 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 additon, 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 descirbe 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.