Watershed Protection of the Mohawk River Watershed
Phase I

Wetlands around Canada Lake, Town of Caroga

Prepared by

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Summary

This Mohawk River Watershed study is one of ten U. S. Environmental Protection Agency funded State Wetlands Protection Program projects awarded to the Adirondack Park Agency (Agency) thus far. This project consisted of two phases. This report applies to Phase I only.

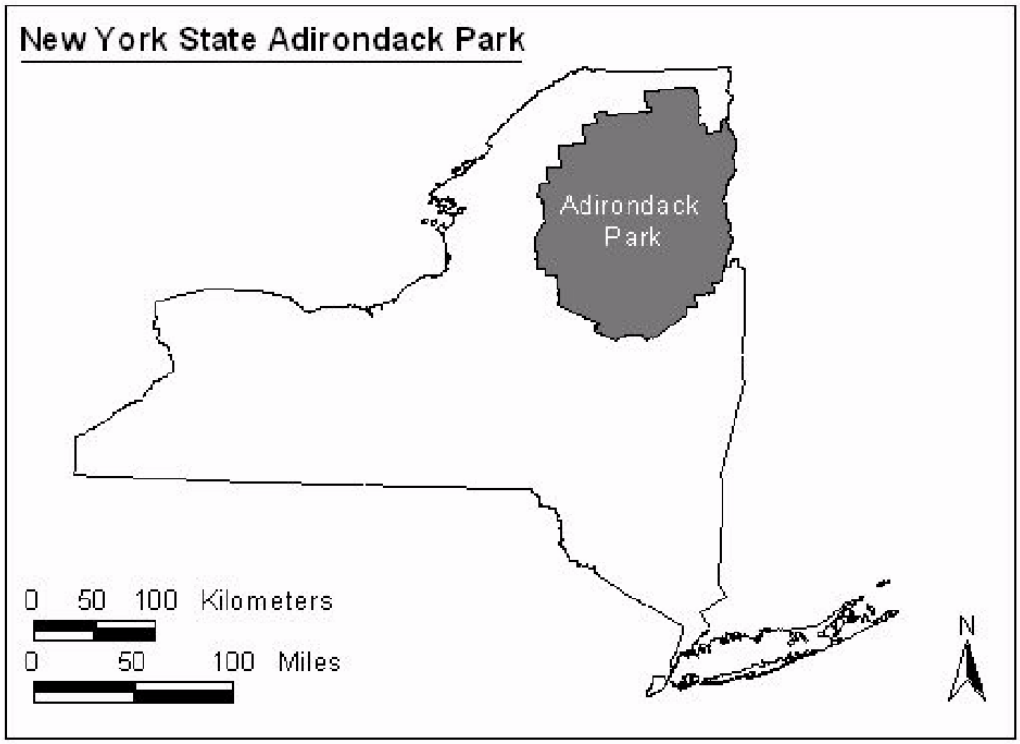
The primary objective of Phase I of this project was to perform aerial photo delineation of the wetlands within the Adirondack Park portion of the Mohawk River Watershed. The Remote Sensing Lab (RSL) at SUNY Plattsburgh was contracted to meet this objective, and the delineations were quality assurance/ quality control assessed by Agency staff. Any necessary changes were made by RSL staff to produce the final overlays.

Wetland delineations completed for this project, when combined with the data layers from the Oswegatchie/Black, Upper Hudson, and St. Lawrence watersheds, provide a consistent continuous representation of the wetlands and surface hydrology for most of the Adirondack Park and will be of immense value to future wetland resource protection and planning.

Background and Study Area

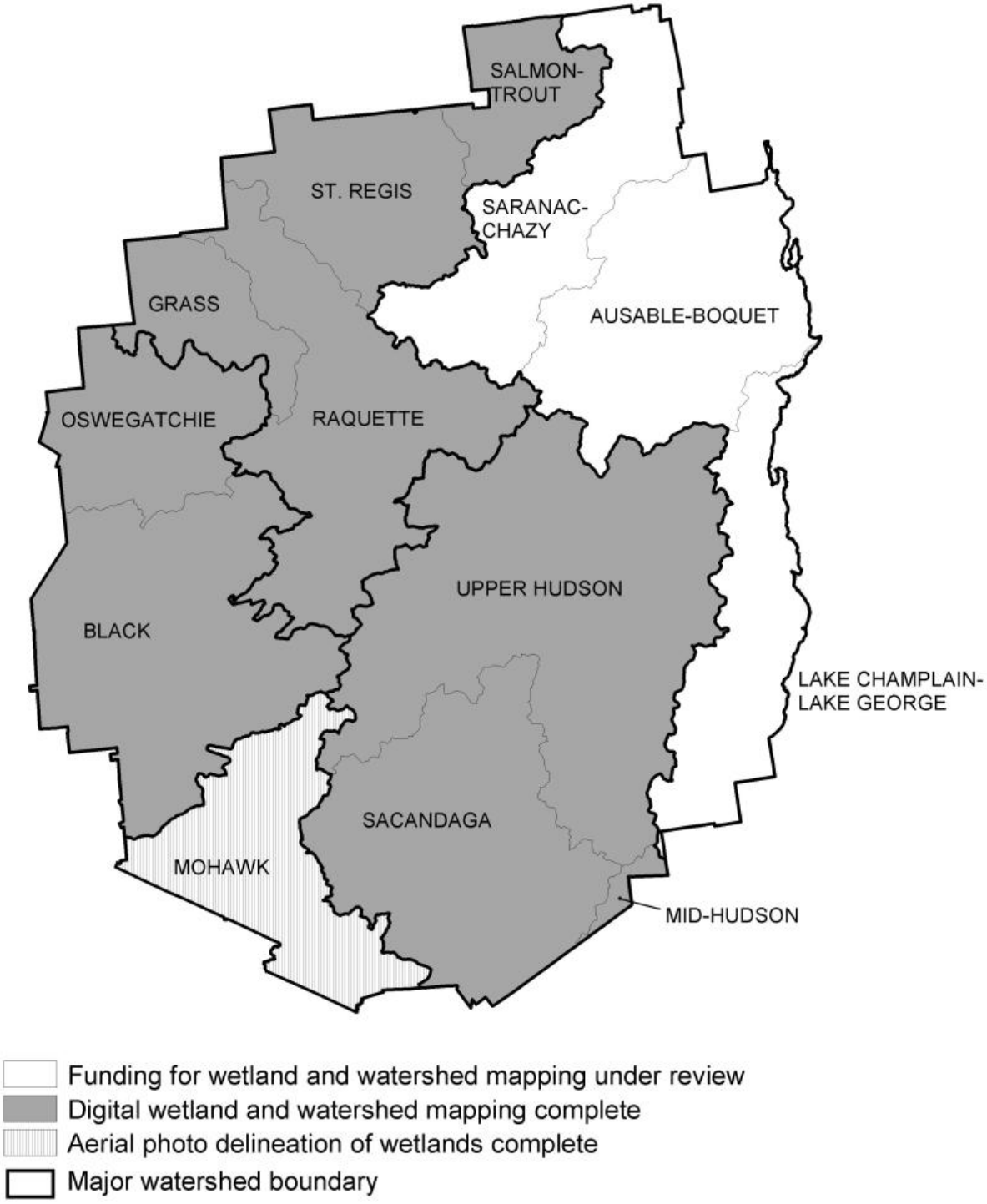
The Adirondack Ecological Zone, corresponding to the legislatively defined New York State Adirondack Park, comprises a 6 million-acre (2.4 million-ha), predominately forested region of northern New York (Figure 1). Nearly 340,000 wetland hectares, including deepwater marshes, fens, kettlehole bogs, and over 3,000 associated lakes and ponds are situated in the region. Approximately 43% (2.5 million acres, 1 million hectares) of the Park is owned by the State of New York and is constitutionally protected as "forever-wild" Forest Preserve. Private lands devoted principally to forestry, agriculture, and open-space recreation account for 52% of the Park (3 million acres, 1.2 million hectares). The Park contains the largest wilderness acreage east of the Mississippi River as well as numerous settlement areas with attendant use conflicts. Because of the biological diversity in wetlands and the range of land uses, the Park is an ideal area in which to undertake a project seeking to characterize the wetland resource on a detailed watershed basis.

Figure 1. Location of the Adirondack State Park in New York State



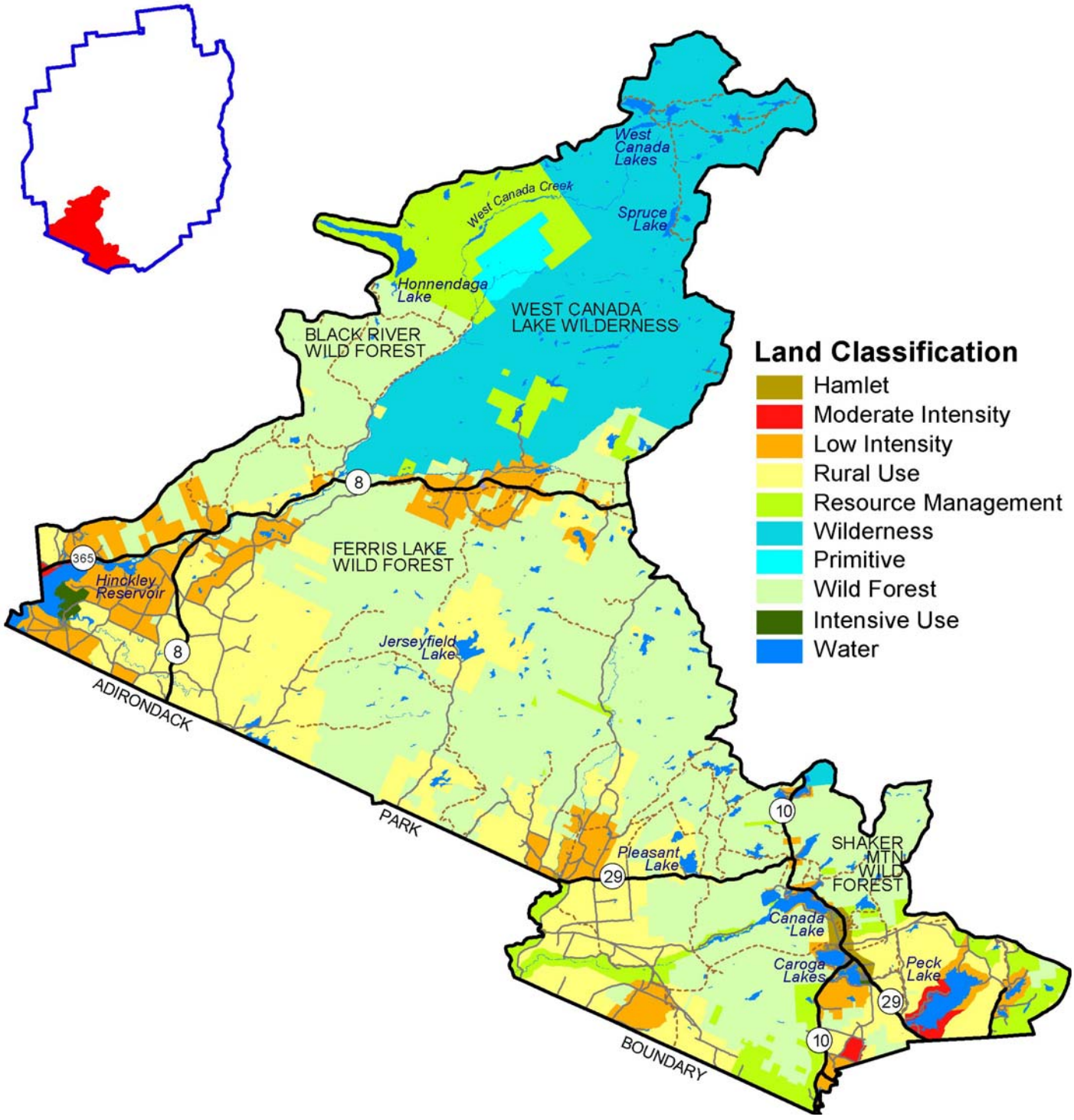
The Mohawk River watershed is one of five major drainage basins in the Park. The Mohawk watershed is located in the southern region of the Adirondack Park (Figure 2) and encompasses approximately 383,000 acres (155,000 hectares). The Mohawk is bordered to the northwest by the Oswegatchie/Black watershed (mapping completed with funding from the Environmental Protection Agency (EPA) under grant #CD992087-01 and #CD992987-01 in 1997). The Greater Upper Hudson watershed forms the northeast border (completed under EPA grant #CD992443-01 in 2000). The southern edge of the Mohawk watershed is clipped by the southern boundary of the Adirondack Park.

Figure 2. Major watersheds within the Adirondack Park. Currently, EPA-funded State Watershed Protection Program grants have enabled the mapping of four of the major watersheds of the Park for sub-watersheds and wetlands. These major watersheds include the Greater Upper Hudson, the Oswegatchie/Black, the St. Lawrence, and the Mohawk watersheds.



81% of the Mohawk River Watershed is State Forest Preserve land (Figure 3). On these Forest Preserve lands there are extensive areas of old growth forest or forest nearing old growth quality. The headwaters of the watershed is a Wilderness Area drained by West Canada Creek, a segment of which is classified as "wild" under the New York States Wild Scenic and Recreational Rivers Act. The highest point in the watershed is Pillsbury Mountain at 3597 ft., and the lowest point, 902 ft., is Sprite Creek where it leaves the Park.

Figure 3. Adirondack Park Land Use Classification in the Mohawk River Watershed.



Goals and Objectives

The goal of the Mohawk River Watershed project is to create a watershed context in which to characterize, evaluate and protect the wetlands in the basin. To achieve this goal, the project is divided into two phases with various objectives:

- Phase I – aerial photo delineation of the wetlands within the Adirondack Park portion of the Mohawk River Watershed.

- Phase II – photo-to-map transfer of wetlands and digitization, watershed delineation and digitization, integration with data from contiguous watersheds (Oswegatchie-Black and Upper Hudson), distribution and interpretation to the public.

This project accomplishes Phase I only.

Methods

The Agency purchased color infrared 1:40,000-scale aerial photo transparencies from the National Aerial Photography Program (NAPP) that was flown in 1994-99 (Appendix 1 lists the 7.5-minute quads comprising the watershed. Appendix 2 is an index of aerial photo flight lines and photo centers for the watershed.). The Agency solicited requests for proposals to undertake wetlands interpretation from the aerial photos. Sealed bids were received from independent remote sensing firms, and the Remote Sensing Lab (RSL) of the State University of New York at Plattsburgh (SUNY Plattsburgh) based on the response to the RFP.

RSL staff performed the initial aerial photo interpretation in their facilities at SUNY Plattsburgh. Using an Image Interpretations Systems Stereo Zoom Transfer Scope and the NAPP transparencies, the wetlands were delineated on acetate overlays (Figures 4 and 5). Polygons were drawn around different wetland cover types, which can be distinguished by color, sharpness, and topographic position from stereoscopic photo pairs, and labeled the polygons using a modified National Wetlands Inventory (NWI) Classification System (Cowardin *et al.* 1979) (Appendix 3). On September 17, 2002 and October 10-11, 2002, RSL staff performed field checks of some of the accessible wetlands to verify NWI label assignments (Figure 6).

The NWI labeling system accounts for dominant cover types in both the understory and overstory of a wetland. Therefore, it is possible for a single delineated polygon to contain two different cover type labels, the dominant two (each with at least 30% of overall coverage), with the first label being the taller vegetation and the second label being the shorter vegetation (i.e. FOx is a forested wetland label which would always be listed before SSx, a shrub-shrub wetland label). Table1 lists a number of common cover types found in the Mohawk River Watershed.

After RSL staff completed the initial photo interpretation, Agency staff performed a quality assurance and quality control assessment. All photo overlays were checked for non-delineated wetlands, upland areas mistakenly labeled as wetlands, and incorrect cover type labels. Any errors or omissions were sent back to the RSL at SUNY Plattsburgh for rectification and finalization.

Figure 4. Scanned photo and acetate overlay from southwest portion of West Canada Mountain quad. The thick white lines represent 7.5-minute quad boundaries (straight) and the boundary of the Mohawk River Watershed (curved).

Figure 5. Enlarged area of scanned air photo and overlay showing NWI labeling scheme.

Figure 6. Photos taken during the September 17, 2002 field checking exercise at Canada Lake. Both pictures show wetlands that are labeled SS1-EM1.

Table 1. Major wetland cover types found within the Adirondack Park.

NWI Label	Wetland classification	Representative Plant Species
OW	Open water	pondweed, milfoil, eelgrass, or none
EM1	Persistent-leaved emergent	cattail, grasses, sedges, rushes, pickerelweed
SS1	Broad-leaved deciduous scrub shrub	speckled alder, willow, dogwood
SS2	Needle-leaved deciduous scrub shrub	stunted or young eastern larch
SS3	Broad-leaved evergreen scrub shrub	leatherleaf
SS4	Needle-leaved evergreen scrub shrub	stunted or young black spruce or balsam fir
SS5	Dead scrub shrub	dead shrubs
FO1	Broad-leaved deciduous forested	red maple, silver maple, black/green ash
FO2	Needle-leaved deciduous forested	eastern larch
FO4	Needle-leaved deciduous forested	balsam fir, red and black spruce, hemlock, white cedar
FO5	Dead forested	standing dead trees
AB3	Rooted vascular aquatic bed	submerged aquatic vegetation

Results and Discussion

This project successfully produced detailed and current aerial photo interpretation of the Adirondack Park portion of the Mohawk River Watershed. A list of the aerial photos for which interpretations were conducted is found in Table 2.

The project has tremendous benefits to the understanding of the Mohawk River Watershed within the Park and the wetlands protection programs of the Adirondack Park Agency because it has provided the first ever watershed-wide look at the wetland resources of the Mohawk River Watershed. This project adds to the landscape scale natural resource database being developed through previous EPA grants for the Adirondack Park and helps in refining the process for providing consistent inputs for wetlands Geographic Information Systems database development. The project provides an initial baseline of wetlands data upon which future wetland mapping and research projects will be based.

Table 2. Aerial photos used in photo interpretation.

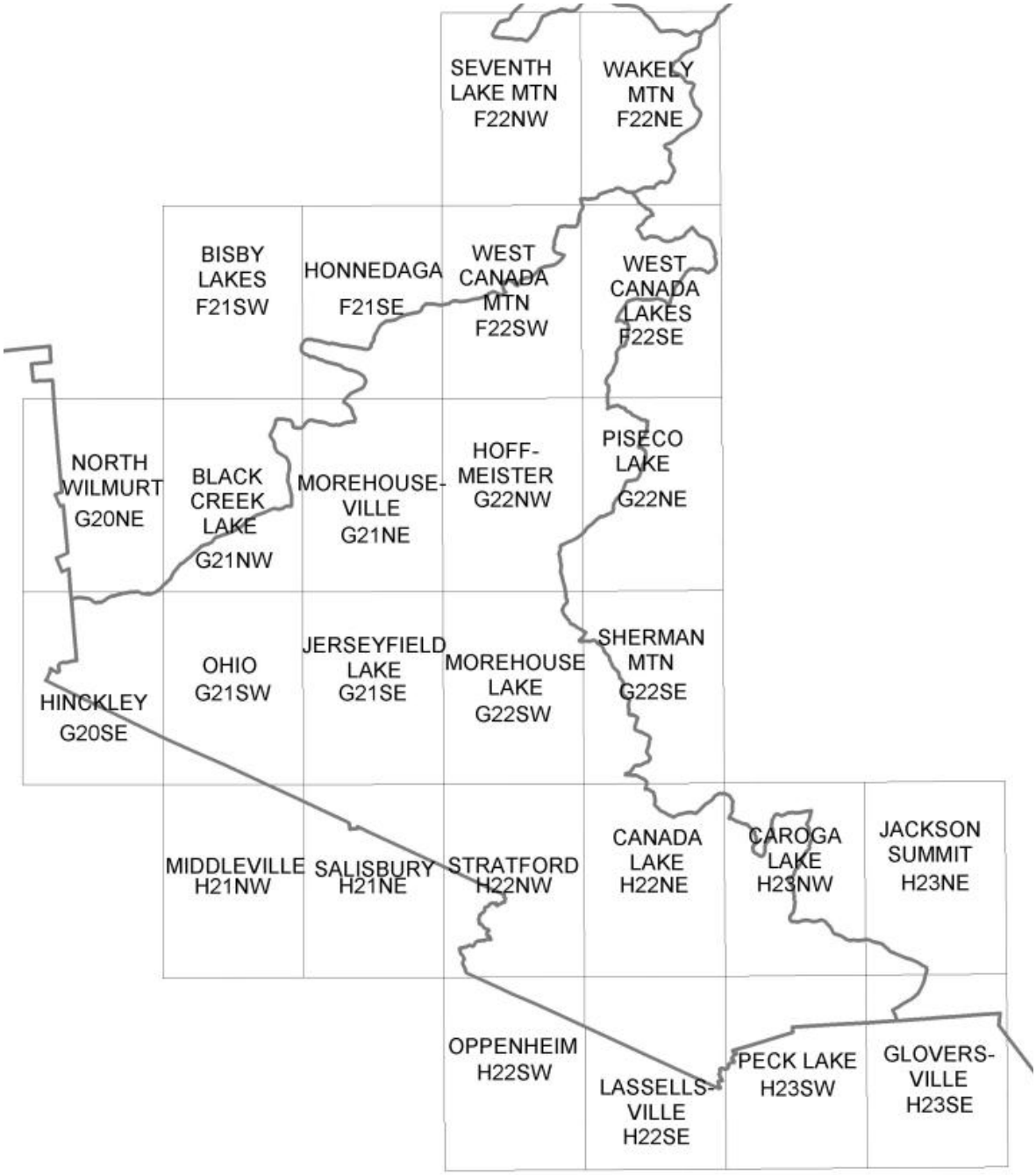
Photo ID	Photo Date	Quadrangle
8023-119	5-14-94	West Canada Lakes
8023-121	5-14-94	West Canada Lakes
8023-123	5-14-94	Piseco Lake
8023-125	5-14-94	Piseco Lake
8023-128	5-14-94	Piseco Lake
8023-130	5-14-94	Piseco Lake
8023-132	5-14-94	West Canada Lakes
8023-134	5-14-94	West Canada Lakes
8023-136	5-14-94	Wakely Mountain
8023-138	5-14-94	Wakely Mountain
8032-59	5-8-95	Hinckley
8032-61	5-8-95	Hinckley
8032-83	5-8-95	Hinckley
8032-85	5-8-95	Hinckley
8032-98	5-8-95	Salisbury
8032-115	5-8-95	Salisbury

8035-3	5-7-96	Ohio
8035-5	5-7-96	Ohio
8035-7	5-7-96	Black Creek Lake
8039-25	5-2-97	Oppenheim
8039-27	5-2-97	Stratford
8039-29	5-2-97	Stratford
8039-32	5-2-97	Stratford
8039-34	5-2-97	Stratford
8039-36	5-2-97	Oppenheim
8769-12	4-30-97	Gloversville
8769-14	4-30-97	Jackson Summit
8770-12	5-8-97	Lassellsville
8770-14	5-8-97	Canada Lake
8770-16	5-8-97	Canada Lake
8770-18	5-8-97	Sherman Mt.
8770-20	5-8-97	Sherman Mt.
8770-27	5-8-97	Caroga Lake
8770-29	5-8-97	Caroga Lake
8770-31	5-8-97	Peck Lake
8770-33	5-8-97	Peck Lake
8770-44	5-8-97	Lassellsville
8770-46	5-8-97	Lassellsville
8770-48	5-8-97	Canada Lake
8770-50	5-8-97	Canada Lake
8770-63	5-8-97	Caroga Lake
8770-65	5-8-97	Peck Lake
10298-29	4-10-98	Ohio
10298-31	4-10-98	Ohio
10298-33	4-10-98	Middleville
10947-48	5-24-98	Jerseyfield Lake
10947-50	5-24-98	Jerseyfield Lake
10947-52	5-24-98	Morehouseville
10947-54	5-24-98	Morehouseville
10947-56	5-24-98	Honnedaga
10947-82	5-24-98	Hoffmeister
10947-84	5-24-98	Hoffmeister
10947-92	5-24-98	Morehouse Lake
10947-94	5-24-98	Morehouse Lake
10948-36	5-14-99	Jerseyfield Lake
10948-38	5-14-99	Jerseyfield Lake
10948-40	5-14-99	Morehouseville
10948-42	5-14-99	Morehouseville
10948-44	5-14-99	Honnedaga
10948-47	5-14-99	Morehouseville
10948-86	5-14-99	Black Creek Lake
10948-88	5-14-99	Black Creek Lake
10948-97	5-14-99	Morehouse Lake
10948-99	5-14-99	Morehouse Lake
10948-102	5-14-99	West Canada Mt.
10948-104	5-14-99	West Canada Mt.
10948-142	5-14-99	West Canada Mt.
10948-144	5-14-99	West Canada Mt.
10948-147	5-14-99	Hoffmeister
10948-149	5-14-99	Hoffmeister

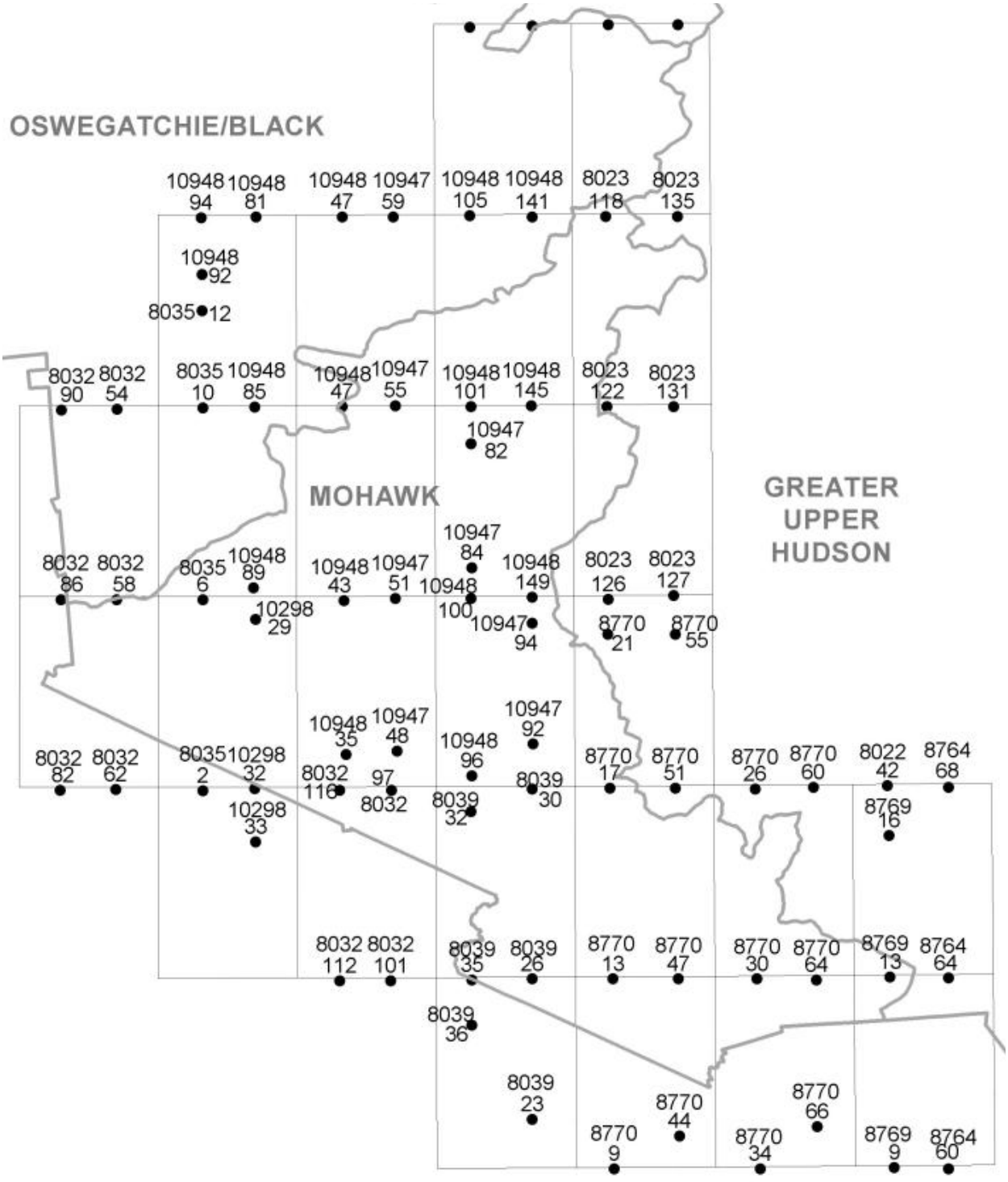
Literature Cited

Cowardin, L.M., Carter V., Golet, F.C., and LaRoe, E.T. 1979. Classification of wetlands and deepwater habitats of the United States. Washington, D.C.: U.S. Fish and Wildlife Service FWS/OBS-79/31. 103pp.

APPENDIX 1: 7.5-Minute Quad List



APPENDIX 2: Index for Aerial Photos within the Mohawk River Watershed



KEY

Flight Line

Photo ID

APPENDIX 3: Legend for Adirondack Park Wetlands Mapping Project

SYSTEMS AND SUBSYSTEMS

R Riverine
- 1 Tidal
- 2 Lower Perennial
- 3 Upper Perennial
- 4 Intermittent
- 5 Unknown Perennial*

L Lacustrine
- 1 Limnetic
- 2 Littoral

P Palustrine
- No Subsystems

CLASSES AND SUBCLASSES

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*

FO Forested
- 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

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

ML Moss/Lichen
- 1 Moss
- 2 Lichen

RS Rock Bottom
- 1 Bedrock
- 2 Rubble

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

RS Rocky Shore
- 1 Bedrock
- 2 Rubble

EM Emergent
- 1 Persistent
- 2 Non-persistent

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

OW Open Water/Unknown Bottom*

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,E 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

SPECIAL MODIFIERS

Special
- b Beaver
- d Partially Drained/Ditched
- f Farmed
- h Diked/Impounded
- r Artificial
- s Spoil
- x Excavated
- /U Upland Cover Type Mixed with Wetland

Soils
- g Organic
- h Mineral

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 efforts.