3. Technical Strategy Stage 1: Define Existing Conditions

3.1 Wetlands

Wetlands are defined both in terms of natural resources and by their regulatory status. From a natural resource perspective, wetlands are ecosystems that depend on constant or recurrent shallow inundation or saturation at or near the surface. Wetlands include swamps, marshes, fens, and bogs. The characteristics and functions of a given wetland are determined by climate, hydrology, and substrate, as well as by its position and dominance in the landscape. While wetlands have a vast range of features, they share some specific structural and functional characteristics such as water, substrate, and biota as well as nutrient cycling, water balance, and production of organic compounds.

Wetlands functions are the physical, chemical, and biological processes that characterize wetland ecosystems, such as flooding, denitrification, and provision of habitat and support to wildlife. Wetlands have been shown to have the ability to significantly improve water quality (Kelly and Harwell, 1985, Nixon and Lee, 1988). This is particularly true of wetlands associated with stream corridors. Wetlands are a critical component of these riparian corridors. Wetland vegetation can keep stream channels intact by both slowing runoff and by evenly distributing its energy. Wetland vegetation can also regulate stream temperature by providing streamside shading.

Wetlands are defined and regulated by both New York State Department of Environmental Conservation (NYSDEC) and the U.S. Army Corps of Engineers (ACOE). Both agencies hold jurisdiction over the wetlands in the Cayuga Lake watershed. The ACOE, in accordance with Section 404 of the Clean Water Act, regulates the filling of "waters of the United States." This includes streams, lakes, impoundments, intermittent drainage ways, and associated wetlands. The ACOE defines wetlands as "Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

At the state level, wetlands and watercourses are regulated by the NYSDEC in accordance with the Article 24 *Freshwater Wetlands* and Title 23 of Article 71 of the Environmental Conservation Law. NYSDEC defines wetlands as: "Lands and submerged lands commonly known as swamps, sloughs, bogs, and flats which support wetland vegetation. Wetland vegetation is categorized into wetland trees, wetland shrubs, and wet meadow vegetation that... 'depend on permanent or seasonal flooding [wetland hydrology] or sufficiently water-logged soils [hydric soils] to give them a competitive advantage over other [vegetation].'

3.1.1 Watershed-Wide Characterization of Wetlands

The Cayuga Lake Watershed contains approximately 6,575 acres of New York State Department of Conservation regulated wetlands or about 1% of the total watershed area. These state designated wetlands, 12.5 acres in size by definition, often coinciding with the U.S. Fish and Wildlife National Wetlands Inventory (NWI) designated wetlands. There are many more wetlands under this threshold that are not regulated. The large wetlands (> 12.5 acres) are

regulated at both the Federal level (by the Army Corps of Engineers) and the State level (by NYSDEC). These agencies require a 100 feet buffer around regulated wetlands.

As indicated on Map 4, Cayuga Lake Watershed Wetlands, the large NYSDEC-designated freshwater wetlands are generally evenly distributed from the north to the south within the watershed with slightly more located toward the south end. In the east-west direction, the wetlands are clustered along the edges of the watershed away from the lake.

The largest wetland areas, which are mainly forested, are located on the upper portions of the watershed away from the lake shoreline. This is consistent with the steep topography along both sides of the watershed. There is a large wetland area in the northwestern edge of the watershed, in the upper reaches of the Red Creek watershed. At the north end of the lake is the Montezuma National Wildlife Refuge, a very large (6,820-acre) wildlife refuge.

Smaller wetlands are scattered throughout the upper watershed area. These smaller wetland areas, which have a high diversity of cover types, tend to be clustered in the outer edges of the watershed. They are more evenly distributed in the east-west direction than the larger wetlands. Other than those associated with the very large streams and those located at the south and north ends of the lake, very few wetlands are found adjacent to the lake's shoreline.

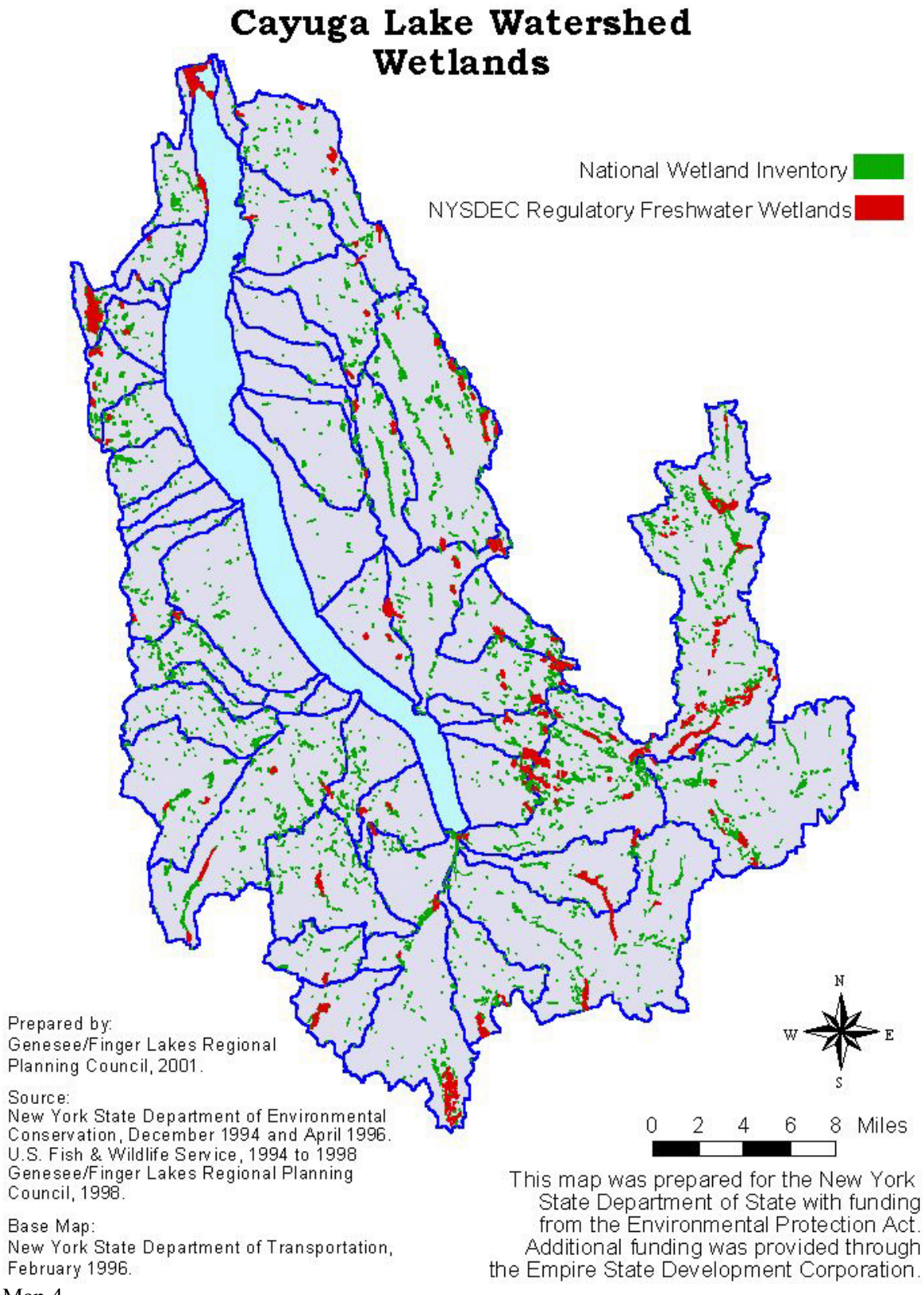
A number of wetland types are found throughout the watershed. The Fish and Wildlife service has mapped wetland cover types throughout the United States and documented these wetlands on the National Wetland Inventory Maps as displayed on Map 4.

The most important wetland communities in the Cayuga Lake watershed are described as follows:

a. *Palustrine Forested, Broad-leaved Deciduous, Seasonally Flooded/Saturated Areas (PFOIE).* PFOIE wetlands make up the largest area of wetlands within the watershed. They are located throughout the watershed, particularly in higher elevations. They consist of overstory trees, such as red maple, black ash and elm, a dense shrub layer, and a sparse understory.

b. *Palustrine Shrub-scrub, Broad-leaved Deciduous, Semi-Permanently Flooded Areas (PSSIF).* These wetlands are present throughout the watershed, although they make up a smaller percentage of the total wetland area. They contain some trees but are dominated by shrubs, such as red-stemmed dogwood and northern arrow-wood, with a variety of herbaceous plants and grasses in the herbaceous layer. These are seasonally flooded areas that maintain standing water in very wet years. In most years, they become ephemeral pools and dry up by the end of the year. Sedges, grasses, broad-leafed cattail, and common arrowhead dominate the wetter portions of these wetlands.

c. *Palustrine Emergent (PEM).* These are freshwater marshes dominated by persistent and non-persistent grasses, rushes, sedges, forbs, and other herbaceous or grass-like plants. Many of the nuisance species are found in these marshes including cattails, water willow (*Decodon verticillatus*), woolgrass, common reed, and purple loosestrife. Other plants often found in the semipermanently flooded areas include pickerelweed, arrowheads,


Cayuga Lake Watershed
Wetlands
National Wetland Inventory
NYSDEC Regulatory Freshwater Wetlands
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0 2 4 6 8 Miles
Prepared by:
Genesee/Finger Lakes Regional Planning Council, 2001.
Source:
New York State Department of Environmental Conservation, December 1994 and April 1996.
U.S. Fish & Wildlife Service, 1994 to 1998
Genesee/Finger Lakes Regional Planning Council, 1998.
Base Map:
New York State Department of Transportation, February 1996.
This map was prepared for the New York State Department of State with funding from the Environmental Protection Act. Additional funding was provided through the Empire State Development Corporation.

Map 4

burrheads, cattails, and soft-stemmed bulrush. Seasonally flooded areas include the cattails, tussock sedge, bluejoint, sweet flag, smartweeds, bulrushes, purple loosestrife, and arrow arum. Sweetflag often forms almost pure stands in depressions of wet pastures.

d. *Open Water Excavated Wetlands (POWZh)*. There are a few open water wetlands within the watershed. Many of these are likely farm ponds created for a variety of purposes. These tend to be hydrologically isolated and fed by a variety of sources.

3.2 Riparian Corridors

The riparian corridor is defined as lands along, adjacent to, or contiguous with perennially and intermittently flowing rivers and streams, and the shores of lakes and reservoirs with stable water levels. Riparian areas form a transition between permanently saturated wetlands and upland areas. The vegetative community and physical characteristics of riparian corridors are strongly influenced by the hydrologic regime: the presence of permanent surface or subsurface water inundation.

Like wetlands, riparian corridors play an important role in water quality, channel stability, erosion control and habitat for wildlife. In addition, they have values more directly related to humans such as aesthetic, recreational and resource values. The focus of the technical strategy was on protecting or restoring the major functions of riparian corridors that relate directly or indirectly to water quality. These functions include hydrologic regulation, filtration of sediment and dissolved nutrients, stabilization of stream structure, and regulation of water temperature.

3.2.1 Watershed-Wide Characterization of Riparian Corridors

Higher order creeks tend to occur in lowlands and are affected by upland land use practices. Examination of the land use patterns indicates that stream corridors in these areas are largely modified by agriculture or development. Alterations to the riparian zone and wetlands as a result of land use changes within the Cayuga Lake Watershed are variable. Additional site-specific data are needed to document these conditions for each stream segment.

Map 5, Land Cover in the Cayuga Lake Watershed shows the land use cover throughout the watershed based on digital aerial photography. An analysis of land uses within 150 feet of the centerline of each stream was carried out based on detailed photo interpretation of aerial photographs. A map of Land Use in the Riparian Corridor (Map 6), and Table 1 and Figure 2 indicate the percent of each land use.

Stream networks are integrally linked to a more extensive network of roadside ditches that need to be considered in riparian restoration efforts. Although functioning only during storm events and spring runoff, there is evidence that this network of ditches within the Cayuga Lake Watershed significantly increases the total volume of discharge and degrades the quality of water entering into their connecting creeks (Schneider 1999). In addition there is evidence from the Roadbank Inventory (G/FLRPC, 2000) that the roadbanks themselves show signs of significant erosion and are a major source of sediment. This, in combination with the road ditch network,