COASTAL FISH AND WILDLIFE RATING FORM

Name of area: **Constitution Marsh**
Designated: **November 15, 1987**
Revised: **August 15, 2012**
County: **Putnam**
Town(s): **Philipstown**
7.5' Quadrangles: **West Point, NY**

Assessment Criteria	**Score**
Ecosystem Rarity (ER) -- the uniqueness of the plant and animal community in the area and the physical, structural and chemical features supporting this community.	
ER Assessment - One of the largest, undeveloped, tidal wetlands on the Hudson River; rarity reduced by chemical contamination of the habitat. Geometric mean: $\sqrt{16} \times \sqrt{25} = 20$	**20**
Species Vulnerability (SV) – the degree of vulnerability throughout its range in New York State of a species residing in the ecosystem or utilizing the ecosystem for its survival.	
SV Assessment –Bald eagle (T), Northern harrier (T), least bittern (T), Eastern small-footed bat (SC). Peregrine falcon (E) occasional forager in marsh. Additive Division: 25 + 25/2 + 25/4 + 16/8=45.75	**45.75**
Human Use (HU) -- the conduct of significant, demonstrable commercial, recreational, or educational wildlife-related human use, either consumptive or non-consumptive, in the area or directly dependent upon the area.	
HU Assessment --The majority of the marsh area is managed by the National Audubon Society to provide fish and wildlife research, education and related recreation to residents of the Hudson Valley. The Foundry Cove portion of the area is similarly managed by Scenic Hudson.	**16**
Population Level (PL) – the concentration of a species in the area during its normal, recurring period of occurrence, regardless of the length of that period of occurrence.	
PL Assessment -- Concentrations of waterfowl and passerines in this area are unusual in the lower Hudson Valley. Geometric mean: $\sqrt{4} \times \sqrt{9} = 6$	**6**
Replaceability (R) – ability to replace the area, either on or off site, with an equivalent replacement for the same fish and wildlife and uses of those same fish and wildlife, for the same users of those fish and wildlife.	
R Assessment – Irreplaceable	**1.2**
Habitat Index (ER+SV+HU+PL)= 87.75	**Significance (HI x R)= 105.3**

LOCATION AND DESCRIPTION OF HABITAT

Constitution Marsh is located on the east side of the Hudson River, between the villages of Garrison and Cold Spring, in the Town of Philipstown, Putnam County (7.5' Quadrangle: West Point, N.Y.). The fish and wildlife habitat is an approximate 430 acre wetland, separated from the Hudson River by Constitution Island and the Metro North railroad.

The predominant ecological communities in the area include tidal marshes and flats, ranging in salinity from freshwater to brackish. Approximately three-fourths of this area is tidal emergent marsh, dominated by narrow-leaved cattail (*Typha angustifolia*); the remainder is predominantly intertidal mudflats, and shallow, subtidal beds of aquatic vegetation, mainly water celery (*Vallisneria americana*). Constitution Marsh receives freshwater inflows from several small, high gradient, coldwater streams, including Foundry Brook, Indian Brook and Philipse Brook. The wetland is hydrologically connected to the Hudson River through openings in the railroad causeway at each end of Constitution Island. The land area surrounding Constitution Marsh is generally steep, rocky, currently undeveloped, forestland. Most of the Constitution Marsh fish and wildlife habitat is owned by New York State and is managed by the National Audubon Society as a wildlife sanctuary. Scenic Hudson owns and manages a portion of Foundry Cove. Remaining portions are privately owned.

This area provides habitat for numerous threatened and endangered plant species: clustered sedge (*Carex cumulata*) (T), Eastern annual saltmarsh aster (*Symphyotrichum subulatum*) (T), Long's bittercress (*Cardamine longii*) (T), smooth bur-marigold (*Bidens laevis*) (T), spongy arrowhead (*Sagittaria calycina*) (T), and water pigmyweed (*Crassula aquatica*) (E).

Habitat disturbances include invasive plant species including common reed (*Phragmites australis*), purple loosestrife (*Lythrum salicaria*) and water chestnut (*Trapa natans*) and past chemical pollution. The chemical pollution (especially cadmium and nickel) is the result of past discharges of wastewater from the Marathon Battery Company in Cold Spring. The contamination was concentrated at the north end of Constitution Marsh in Foundry Cove and in the Hudson River. Remediation and restoration of the contaminated areas was completed in 1995.

FISH AND WILDLIFE VALUES

Constitution Marsh is a large undeveloped tidal wetland with a diverse vegetation community and multiple freshwater inflows creating favorable habitat conditions for many fish and wildlife species. The extensive shallow water areas and stream mouths provide spawning and nursery habitat for a variety of coastal migratory and resident freshwater fishes. Species found in the area include alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), white perch (*Morone americana*, striped bass (*Morone saxatilis*), American eel (*Anguilla rostrata*), banded killifish (*Fundulus diaphanous*), mummichog (*Fundulus heteroclitus)*, fourspined stickleback (*Apeltes quadracus*), and largemouth bass (*Micropterus salmoides*). Red-fiddler crabs (*Uca minax*) have been observed in the habitat area. Constitution Marsh is also used seasonally by snapper bluefish and Atlantic needlefish. The submerged aquatic vegetation provides food for fish, invertebrates and waterfowl as well as refuge for fish and invertebrates.

This area also provides habitat for water snake (*Nerodia s. sipedon*), Eastern gartersnake (*Thamnophis sirtalis*), black rat snake (*Elaphe obsoleta*), Eastern milk snake (*Lampropeltis triangulum*), red-spotted newt (*Notophthalmus v. viridescens*), Eastern redback salamander (*Plethodon cinereus*), Eastern American toad (*Bufo americanas*), gray treefrog (*Hyla versicolor*), spring peeper (*Pseudoacris crucifer*), American bullfrog (*Rana catesbeiana*), green frog (*Rana clamitans*) and wood frog (*Rana sylvatica*).

Sizeable populations of common snapping turtle (*Chelydra serpentina*) have been reported in the area as well.

Eighty-one bird species have been confirmed or are probable breeders at Constitution Marsh. This marsh is especially important for marsh-nesting birds; probable or confirmed breeding species include green-backed heron (*Butorides virescens*), Virginia rail (*Rallus limicola*), least bittern (*Ixobrychus exilis*) (SC), Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), wood duck (*Aix sponsa*), spotted sandpiper (*Actitis macularia*), belted kingfisher (*Ceryle alcyon*), marsh wren (*Cistothorus palustris*), red-winged blackbird (*Agelaius phoeniceus*), willow flycatcher (species at-risk) (*Empidonax traillii*), and swamp sparrow (*Melospiza georgiana*). A number of other birds are known to utilize the marsh and surrounding woodlands, including sora (*Porzana carolina*), American black duck (*Anas rubripes*), American goldfinch (*Carduelis tristis*), common yellowthroat (*Geothlypis trichas*), yellow warbler (*Dendroica petechia*), merlin (regular migrant) (*Falco columbarius*), blue-winged warbler (probable breeder), cerulean warbler (*Vermivora pinus*) (SC), worm-eating warbler (*Helmitheros vermivorus*) (species at-risk in adjacent woodlands), and Canada warbler (*Wilsonia canadensis*) (regular migrants).

Concentrations of herons, waterfowl, and shorebirds also occur in Constitution Marsh during spring and fall migrations (March-April and September-November, respectively). American bittern (SC), osprey (*Pandion haliaetus*)(SC), bald eagle (*Haliaeetus leucocephalus*) (T) Cooper's hawk (*Accipiter cooperii*)(SC), least bittern (*Ixobrychus exilis*) (T) hundreds of American black duck, bobolink (*Dolichonyx oryzivorus*), common grackle (*Quiscalus quiscula),* mallard (*Anas platyrhynchos*), red-winged blackbird (*Agelaius phoeniceus*), swallows, willow flycatcher (*Empidonax traillii*), wood duck (*A. sponsa*), Northern harrier (*Circus cyaneus*)(T), osprey (*P. haliaetus)* (SC), peregrine falcon (*Falco peregrinus*)(E), pied-billed grebe (*Podilymbus podiceps)* (T), red-shouldered hawk (*Buteo lineatus*)(SC) and sharp-shinned hawk (*Accipiter striatus*)(SC) have been observed in this habitat. Bald eagles (H. leucocephalus) have been observed nesting in the vicinity of the marsh.

The diversity and abundance of wildlife species in Constitution Marsh is unusual in the lower Hudson River. Opportunities for birdwatching, wildlife photography, and informal nature study attract visitors from throughout the Hudson Valley. In addition, the National Audubon Society has an active program of environmental education and research focused on this productive wetland area.

IMPACT ASSESSMENT

It is essential that any potential impacts on Constitution Marsh be evaluated with respect to its use for environmental research and education, and the need to maintain natural or controlled experimental conditions.

Any activity that would substantially degrade water quality, increase turbidity or sedimentation, reduce freshwater inflows, or alter tidal fluctuations in Constitution Marsh would result in significant impairment of the habitat. Elimination of wetlands or shallow areas, through dredging, filling, or bulkheading, would result in a direct impact on valuable fish and wildlife habitats. Activities that would subdivide this relatively large, undisturbed area into smaller fragments should be restricted. Habitat management activities, including expansion of productive littoral areas, may be designed to maintain or enhance populations of certain fish or wildlife species. Despite past remedial action, contaminated soils remain. Any activity, other than further remediation, that would mobilize existing contaminants should be avoided.

Elimination of existing adjacent wetland and forested habitats would adversely affect the habitat. Existing vegetated riparian buffer zones woodlands bordering Constitution Marsh should be maintained

for their value as cover, soil stabilization, perch sites, and buffer zones; significant human encroachment into the adjacent area could adversely affect certain species of wildlife. Habitat disturbances would be most detrimental during bird nesting, and fish spawning and nursery periods, which generally extend from April through August for most warm water species.

The submerged aquatic vegetation beds would be negatively impacted by changes in the littoral zone through dredging and/or filling as well as changes in water quality. Where opportunities exist, appropriate restoration of intertidal and subtidal shallow habitats should be undertaken using the best available science and proper monitoring protocols. Restoration and enhancement efforts should be monitored, and the associated habitat effects should be reported and evaluated.

The presence of invasive species and the expansion of their range within the habitat may result in changes in native plant, vertebrate and invertebrate species composition and abundance. In particular, changes in plant communities may affect marsh-nesting birds. Effective control of invasive plant species, through a variety of means, may improve fish and wildlife species use of the area. Control methods, including biological controls and regulated use of herbicides must only be implemented, if other methods of control have been explored, and then only under permit with strict adherence to all precautionary measures to avoid impacts to non-target species. The primary goals of such efforts must be recovery and maintenance of habitat for native fish and wildlife species.

HABITAT IMPAIRMENT TEST

A **habitat impairment test** must be met for any activity that is subject to consistency review under Federal and State laws, or under applicable local laws contained in an approved local waterfront revitalization program. If the proposed action is subject to consistency review, then the habitat protection policy applies, whether the proposed action is to occur within or outside the designated area.

The specific **habitat impairment test** that must be met is as follows.

> In order to protect and preserve a significant habitat, land and water uses or development shall not be undertaken if such actions would:
>
> 1. destroy the habitat; or,
>
> 2. significantly impair the viability of a habitat.

Habitat destruction is defined as the loss of fish or wildlife use through direct physical alteration, disturbance, or pollution of a designated area or through the indirect effects of these actions on a designated area. Habitat destruction may be indicated by changes in vegetation, substrate, or hydrology, or increases in runoff, erosion, sedimentation, or pollutants.

Significant impairment is defined as reduction in vital resources (e.g., food, shelter, living space) or change in environmental conditions (e.g., temperature, substrate, and salinity) beyond the tolerance range of an organism. Indicators of a significantly impaired habitat focus on ecological alterations and may include but are not limited to reduced carrying capacity, changes in community structure (food chain relationships, species diversity), reduced productivity and/or increased incidence of disease and mortality.

The *tolerance range* of an organism is not defined as the physiological range of conditions beyond which a species will not survive at all, but as the ecological range of conditions that supports the species

population or has the potential to support a restored population, where practical. Either the loss of individuals through an increase in emigration or an increase in death rate indicates that the tolerance range of an organism has been exceeded. An abrupt increase in death rate may occur as an environmental factor falls beyond a tolerance limit (a range has both upper and lower limits). Many environmental factors, however, do not have a sharply defined tolerance limit, but produce increasing emigration or death rates with increasing departure from conditions that are optimal for the species.

The range of parameters which should be considered in applying the habitat impairment test includes but is not limited to the following:

1. physical parameters such as living space, circulation, flushing rates, tidal amplitude, turbidity, water temperature, depth (including loss of littoral zone), morphology, substrate type, vegetation, structure, erosion and sedimentation rates;
2. biological parameters such as community structure, food chain relationships, species diversity, predator/prey relationships, population size, mortality rates, reproductive rates, meristic features, behavioral patterns and migratory patterns; and,
3. chemical parameters such as dissolved oxygen, carbon dioxide, acidity, dissolved solids, nutrients, organics, salinity, and pollutants (heavy metals, toxics and hazardous materials).

KNOWLEDGABLE CONTACTS

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