COASTAL FISH AND WILDLIFE RATING FORM

Name of area: **Hudson Highlands**
Designated: **November 15, 1987**
Revised: **August 15, 2012**
County: **Dutchess, Orange, Rockland, Putnam, and Westchester**
Town(s): **Fishkill, New Windsor, Cornwall, Highlands, Stony Point, Philipstown, Cortlandt**, **Peekskill**
7.5' Quadrangles: **Cornwall, NY; West Point, NY; Peekskill, NY; Haverstraw, 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 - An extensive area of deep, turbulent river channel with strong currents and rocky substrates; unusual in the Hudson River estuary.	**25**
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), shortnose sturgeon (E), and Atlantic sturgeon (E). Additive Division: 36+ 36/2+25/4=60.25	**60.25**
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 -- Striped bass production in this area contributes to commercial and recreational fisheries in the State of New York.	**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 -- A major spawning area for Hudson River striped bass; Major nursery and summering area for Atlantic sturgeon (E).	**25**
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)= 126.25	**Significance Value (HI x R)= 151.5**

LOCATION AND DESCRIPTION OF HABITAT

Hudson Highland extends roughly from Denning's Point to Stony Point, in the Towns of New Windsor, Cornwall and Highlands, Orange County; Stony Point, Rockland County; Fishkill, Dutchess County; Philipstown, Putnam County; and Cortlandt, Westchester County (7.5' Quadrangles: West Point, N.Y.; and Peekskill, N.Y.; Haverstraw, N.Y.). The fish and wildlife habitat encompasses 6,700 acres of the main river channel below mean low water and adjacent shallows and shoals, over an approximate twenty-mile reach. This area is a very narrow and deep (up to 200 feet deep) section of the Hudson River with strong currents and a rocky bottom substrate.

The land area bordering Hudson Highlands is predominantly steep, rocky, hillsides with a variety of land uses including undeveloped forestland (e.g., Storm King, Bear Mountain, and Hudson Highlands State Park Preserve), small urban centers, and the West Point Military Reservation. In addition, railroad tracks closely follow the shoreline on both sides of Hudson River in this habitat area. Water salinity throughout is variable as the salt front migrates up and down the river through this area depending on tidal conditions and the amount of freshwater inflows up-river, which are dependent on seasonal weather patterns and extreme events. US Geological Survey data between 1992 and 2012 show that the slat front can occur on a daily basis from as far south as the Battery (RM 0) to north of Poughkeepsie (RM 77), but during this 20 year period the salt front was generally between River Miles 30-70.

The habitat also includes most of Iona Island, which is part of the Hudson River National Estuarine Research Reserve, an area dedicated to environmental research and education. The submerged aquatic vegetation beds occurring along the eastern shore are dominated by water celery (*Vallisneria americana*).

FISH AND WILDLIFE VALUES

Hudson Highlands is the Hudson's deepest and narrowest segment, with strong currents and rocky substrates. The inputs of three major tributaries (Wappinger, Fishkill, and Moodna Creeks) contribute to the development of strong currents within the narrow, deep river channel. The combination of swift currents, rocky substrates, and freshwater inflow (during spring runoff) over this large area provides highly favorable conditions for reproduction by coastal migratory fishes, especially striped bass (*Morone saxatilis*). Based on egg abundance data, Hudson Highlands is one of two areas of high striped bass egg deposition in the estuary. Generally, striped bass enter the area to spawn in May and June; the adults leave the area shortly after spawning and within several weeks the eggs have hatched and larval fish begin moving downstream to nursery areas in the brackish portion of the Hudson River. Although the commercial fishery for striped bass in the Hudson River was closed in 1985, the Hudson Highlands contributes to coastal commercial and recreational fisheries.

Deepwater areas such as Hudson Highlands are also used by concentrations of species that spawn elsewhere in the Hudson River estuary. Deep areas are used as migrational routes by Atlantic sturgeon (*Acipenser oxyrhynchus*) (E) and shortnose sturgeon (*Acipenser brevirostrum*) (E) and are important nursery areas and summering areas for juvenile Atlantic sturgeon and summering areas for post-spawn adults. As the salt front moves up through this area a variety of marine species, such as bluefish, anchovy, silversides, and blue claw crab may also enter the area.

Associated with the fisheries resources in Hudson Highlands is a significant concentration of wintering bald eagles (*Haliaeetus leucocephalus*) (T). Because this area rarely freezes in winter it provides a dependable forage habitat for these birds. Winter residence in the area generally extends from December through March. These birds feed throughout Hudson Highlands, and Iona Island is a primary roosting area; the latter has been designated an eagle sanctuary by the Palisades Interstate Park Commission. Other roosting areas include undisturbed woodlands along both sides of the river, especially near

sheltered coves.

The concentrations of anadromous and marine fishes occurring in Hudson Highlands results in recreational fishing opportunities within the area, attracting visitors from throughout the lower Hudson Valley.

Hudson Highlands is a critical habitat for most estuarine-dependent fisheries originating from the Hudson River. This area contributes directly to the production of in-river and ocean populations of food, game, and forage fish species. Consequently, commercial and recreational fisheries throughout the Atlantic Coast benefit from these biological inputs from the Hudson River estuary.

IMPACT ASSESSMENT

Any activities that would degrade water quality, increase turbidity, increase sedimentation, or alter flows, temperature, or water depths in the Hudson Highlands would result in significant impairment of the habitat. Of primary concern in this deep estuarine area would be diversion of freshwater flows out of the Hudson, contamination by toxic chemicals, major structural alterations to the underwater habitat (e.g., dredging, filling, or construction of jetties), and thermal discharges. All species may be adversely affected by water pollution, such as chemical contamination (including food chain effects resulting from bioaccumulation), oil spills, excessive turbidity or sediment loading, nonpoint source runoff, and waste disposal (including vessel wastes). Discharges or runoff of sewage effluent, pesticides, or other hazardous materials into the river could result in adverse impacts on the habitat area.

Any physical modification of the habitat or adjacent wetlands, through dredging, filling or bulkheading, would result in a direct loss of valuable habitat area. Transient habitat disturbances, such as dredging or in-river construction activities, could have significant impacts on striped bass populations during spawning and incubation periods (May-July, primarily). 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, as well as bald eagle overwintering periods (December through March).

Thermal discharges, depending on time of year, could have adverse effects on use of the area by migratory and resident species. Activities that result in the presence of significant electric, magnetic, or electromagnetic field may affect benthic communities, migratory fish movement, and fish egg and larval development. Entrainment and impingement causes significant mortality to all life stages of fish, including endangered species. Activities that would enhance migratory, spawning, or nursery fish habitat, particularly where an area is essential to a species' life cycle or helps to restore an historic species population would be beneficial.

It is essential that activities in the vicinity of Iona Island also be evaluated with respect to its use for environmental research and education, and the need to maintain natural or controlled experimental conditions.

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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Significant Coastal Fish and Wildlife Habitats

Hudson Highlands (In Part) part 1 of 5
Fishkill Creek (In Part)
Moodna Creek (In Part)

N

0 2000 feet

NEW YORK STATE DEPARTMENT OF STATE

N

0 2000

feet

Significant Coastal Fish and Wildlife Habitats

- Hudson Highlands (In Part) part 2 of 5
- Constitution Marsh

NEW YORK STATE DEPARTMENT OF STATE

N

0 2000 feet

Significant Coastal Fish and Wildlife Habitats

Hudson Highlands (In Part) part 3 of 5

Manitou Marsh (In Part)

NEW YORK STATE DEPARTMENT OF STATE

N

0 2000

feet

Significant Coastal Fish and Wildlife Habitats

- Hudson Highlands (In Part) part 4 of 5
- Iona Island Marsh
- Manitou Marsh (In Part)

NEW YORK STATE DEPARTMENT OF STATE

N

0 2000

feet

Significant Coastal Fish and Wildlife Habitats

Hudson Highlands (In Part) part 5 of 5

Haverstraw Bay (In Part)

NEW YORK STATE DEPARTMENT OF STATE