

COASTAL FISH AND WILDLIFE RATING FORM

Name of area: **Moodna Creek**
 Designated: **November 15, 1987**
 Revised: **August 15, 2012**
 County: **Orange**
 Town(s): **Cornwall, New Windsor**
 7.5' Quadrangles: **Cornwall, NY**

<u>Assessment Criteria</u>	<u>Score</u>
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 - A major freshwater tributaries of the lower Hudson River that is accessible to coastal migratory fishes; includes the largest tidal marsh in Orange County.	16
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 –Least bittern (T), bald eagle (T), American bittern (SC) Additive division: $25 + 25/2 + 16/4 =$	41.5
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 -- Recreational fishing opportunities attract many Orange County anglers, paddlers, and nature observers to the area.	4
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 various wetland wildlife species and coastal migratory fishes in this area are unusual in Orange County and the Hudson Valley Region.	9
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)= 70.5	Significance Value(HI x R)= 84.6

LOCATION AND DESCRIPTION OF HABITAT

Moodna Creek is located on the west side of the Hudson River, just north of the Village of Cornwall, in the Towns of New Windsor and Cornwall, Orange County (7.5' Quadrangle: Cornwall, N.Y.). The fish and wildlife habitat, encompassing approximately 300 acres, is an approximate three and one-half mile segment of this freshwater tributary extending from its mouth on the Hudson River to a dam located just upstream from the N.Y.S. Route 32 bridge at Orrs Mill. It includes a portion of the Kowawese Unique Area at Plum Point, a state-owned protected area managed by Orange County.

Moodna Creek is a relatively large, medium gradient, perennial, warmwater stream with a rocky substrate and a relatively undeveloped forested floodplain. The lower mile of the creek is within the tidal range of the Hudson River and is relatively deep with a silt and clay substrate. Below N.Y.S. Route 9W, Moodna Creek widens into a tidal embayment containing extensive areas of emergent marsh, submerged aquatic beds and wooded islands. The submerged aquatic vegetation beds are dominated by water celery (*Vallisneria americana*). The habitat also includes a portion of a woodland north of the mouth of Moodna Creek and a broad, shallow (less than 6 feet deep below mean low water) alluvial flat in the River, off the mouth of the creek. The marsh at the mouth of Moodna Creek is significant for rare plants and rare natural communities including brackish intertidal mudflats and brackish tidal marsh.

Habitat disturbances in the tidal portion of Moodna Creek include those associated with road and railroad crossings, discharges from two sewage treatment plants, adjacent light residential development, some filling of wetlands, and the presence of invasive species including purple loosestrife (*Lythrum salicaria*) and water chestnut (*Trapa natans*).

FISH AND WILDLIFE VALUES

The considerable length of Moodna Creek that is accessible to coastal migratory fishes and the extensive wetland area at the mouth of the creek provide favorable habitat conditions for a variety of fish and wildlife species.

Moodna Creek is an important spawning area for migratory fishes such as alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), bay anchovy (*Anchoa mitchilli*), American eel (*Anguilla rostrata*), Atlantic tomcod (*Microgadus tomcod*), and striped bass (*Morone saxatilis*). Generally, these species enter the stream between April 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 Hudson River. American shad (*Alosa sapidissima*) make use of the waters at the mouth of the creek. Shortnose sturgeon (*Acipenser brevirostrum*) (E) and Atlantic sturgeon (*Acipenser oxyrinchus*) (E) utilize the adjacent deepwater habitats. An exception is Atlantic tomcod that spawn in the area in December and January. The extensive flats at the creek mouth provide spawning and nursery habitat for these species. A substantial warmwater fish community also occurs in the lower portion of Moodna Creek throughout the year. Resident species include bluegill (*Lepomis macrochirus*), brown bullhead (*Ameiurus nebulosus*), channel catfish (*Ictalurus punctatus*), common carp (*Cyprinus carpio*), golden shiner (*Notemigonus crysoleucas*), largemouth bass (*Micropterus salmoides*), pumpkinseed (*Lepomis gibbosus*), smallmouth bass (*Micropterus dolomieu*), white catfish (*Ameiurus catus*), yellow perch (*Perca flavescens*), and white perch (*Morone americana*). As the salt front moves up the Hudson during dry periods, bluefish (*Pomatomus saltatrix*), anchovy (*Anchoa mitchilli*), weakfish (*Cynoscion regalis*), silversides (*Menidia menidia*), hogchoker (*Trinectes maculatus*), and blue crab (*Callinectes sapidus*) may enter the area to feed. The submerged aquatic vegetation beds, mainly water celery (*Vallisneria americana*), provide food for fish, invertebrates and waterfowl as well as refuge for fish and invertebrates.

This area is also habitat for common snapping turtle (*Chelydra serpentina*), water snake (*Nerodia s. sipedon*), red-spotted newt (*Notophthalmus v. viridescens*), redback salamander (*Plethodon cinereus*), American toad (*Bufo americanus*), gray treefrog (*Hyla versicolor*), spring peeper (*Pseudacris crucifer*), bullfrog (*Rana catesbeiana*), green frog (*Rana clamitans*) and wood frog (*Rana sylvatica*).

In addition to its importance as a fisheries resource, Moodna Creek provides valuable habitats for many wildlife species. Many species of shorebirds, wading birds, waterfowl and songbirds are found in this habitat. Probable or confirmed breeding bird species in the area include green-backed heron (*Butorides virescens*), American bittern (*Botaurus lentiginosus*) (SC), least bittern (*Ixobrychus exilis*) (T), Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), American black duck (*Anas rubripes*), wood duck (*Aix sponsa*), Virginia rail (*Rallus limicola*), spotted sandpiper (*Actitis macularia*), belted kingfisher (*Ceryle alcyon*), fish crow (*Corvus ossifragus*), marsh wren (*Cistothorus palustris*), common yellowthroat (*Geothlypis trichas*), hooded warbler (*Wilsonia citrina*), red-winged blackbird (*Agelaius phoeniceus*), downy woodpecker (*Picoides pubescens*), yellow-shafted flicker (*Colaptes auratus*), eastern kingbird (*Tyrannus tyrannus*), and swamp sparrow (*Melospiza georgiana*). Bald eagles (T) forage at the mouth of the creek. Sedge wrens (*Cistothorus platensis*) (T) have also been observed at Moodna Creek.

Locally significant concentrations of herons, waterfowl, and shorebirds, occur in the area, especially during spring and fall migrations. Moodna Creek is reported to be a major crossing point for raptors migrating through the Hudson Valley along the northern slope of the Hudson Highlands. Concentrations of osprey (SC) have been documented at Moodna Creek during spring migration. Ospreys congregate at the confluence of the Moodna and the Hudson to feed on spawning fish and to perch and roost in the tall trees along the shoreline. Since 1980, several bald eagles (T), both adult and immature, have been observed in the summer and winter at the mouth of Moodna Creek and on adjacent Kowawese Unique Area.

The abundant fisheries resources of Moodna Creek provide significant opportunities for recreational fishing, especially with car-top launch facilities at Kowawese Unique Area. The area is popular among Orange County anglers, especially during the summer months. Fishing pressure is concentrated along the shore of Newburgh Bay, in the marshes of Moodna Creek and near road crossings. Opportunities for hunting, trapping, and informal nature study attract county residents and regional visitors to wetland areas on the creek.

IMPACT ASSESSMENT

Any activity that would substantially degrade water quality, increase turbidity or sedimentation, reduce flows, alter tidal fluctuations, or increase water temperature or depths in Moodna Creek would result in significant impairment of the habitat. Discharges of sewage or stormwater runoff containing sediments or chemical pollutants (including fertilizers, herbicides or insecticides) may result in significant adverse impacts on the habitat area. Discharges or runoff of sewage effluent, pesticides, or other hazardous materials into the river would be detrimental to many of the resident aquatic species and also to the potential human uses of those resources. Strict control of treatment plant discharges is necessary to prevent degradation of Moodna Creek by nutrient loading and increased biological oxygen demand (BOD), especially during heavy runoff periods in spring and summer.

Any physical alteration of the habitat, through dredging, filling, or bulkheading, would result in a direct loss of valuable habitat area. Substantial alteration of the creek channel, such as impoundment or creation of barriers to fish passage should be prohibited. Impediments to movement and migration of aquatic species, whether physical or chemical (e.g., dams, dikes, channelization, bulkheading and sedimentation),

should be prohibited. Plans to reduce or eliminate the impacts of existing hydrological modifications should be developed, including improvements to fish passage, and/or the removal of obstructions or barriers. 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.

Thermal discharges, depending on time of year, could have adverse effects on use of the area by migratory and resident species. Of additional concern in this major tributary are the potential effects of upstream disturbances, including water withdrawals, impoundments, stream bed disturbances, and effluent discharges. Entrainment and impingement causes significant mortality to all life stages of fish, including endangered species. Development of hydroelectric facilities or municipal water supplies should only be allowed with run-of-river operations and appropriate minimum flow restrictions, respectively.

Elimination or disturbance of adjacent wetland and forested habitats would adversely affect the habitat. Such areas should be protected, and where possible, restored in order to maintain and/or improve water quality as well as provide bank cover, soil stabilization, nesting/perching sites and buffer areas from development.

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, 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

Natural Resources Bureau
NYS Department of State
99 Washington Ave, Suite 1010
Albany, NY 12231
Phone: (518) 474.6000

Hudson River National Estuarine Research Reserve
Norrie Point Environmental Center
PO Box 315
Staatsburg, NY 12580
Phone: (845) 889.4745

Hudson River Fisheries Unit
NYS Department of Environmental Conservation
21 South Putt Corners Road
New Paltz, NY 12561
Phone: (845) 256.3071

The Hudson River Estuary Program
NYSDEC Region 3
21 S Putt Corners Rd
New Paltz, NY 12561
Phone: (845) 256.3016

New York Natural Heritage Program
625 Broadway, 5th Floor
Albany, NY 12233-4757
Phone: (518) 402.8935

