

COASTAL FISH & WILDLIFE HABITAT RATING FORM

Name of Area: **Buckhorn Island - Goat Island Rapids**

Designated: **October 15, 1987**

County: **Niagara, Erie**

Town(s): **Niagara Falls, Grand Island**

7½' Quadrangle(s): **Niagara Falls, ONT-NY**

<u>Score</u>	<u>Criterion</u>
12	Ecosystem Rarity (ER) A relatively large, shallow, open water section of river; unusual in the western Great Lakes Plain, although somewhat common locally. Geometric mean: $(9 \times 16)^{1/2}$
25	Species Vulnerability (SV) Common Tern (T) nesting and feeding.
0	Human Use (HU) No significant fish or wildlife related human uses of the area.
20	Population Level (PL) An important area used by one of the largest concentrations of wintering waterfowl in the northeastern US. Geometric mean: $(16 \times 25)^{1/2}$
1.2	Replaceability (R) Irreplaceable

SIGNIFICANCE VALUE = $[(ER + SV + HU + PL) \times R]$

= **68**

DESIGNATED HABITAT: BUCKHORN ISLAND - GOAT ISLAND RAPIDS

LOCATION AND DESCRIPTION OF HABITAT:

Buckhorn Island - Goat Island Rapids is located between Grand Island and Goat Island, in the City of Niagara Falls, Niagara County, and the Town of Grand Island, Erie County (7.5' Quadrangle: Niagara Falls, Ont.-N.Y.). The fish and wildlife habitat is an approximate 850 acre area of the upper Niagara River, extending roughly from the Buckhorn Island water diversion structures to the Goat Island bridge and Three Sisters Islands, above the American Falls and Horseshoe Falls, respectively. This area is a wide, fast-moving, and relatively shallow (less than 10 feet deep below mean low water) section of the river, with a sparsely vegetated bedrock substrate. Average annual flow in the Niagara River is approximately 200,000 cubic feet per second, but much of the flow is diverted out of the river for municipal and industrial uses. Nearly all of the upper Niagara River flow in excess of that required by international agreement to flow over the Falls (50,000 to 100,000 cubic feet per second) is diverted from above the Buckhorn Island - Goat Island Rapids area for hydroelectric power generation in the United States and Canada.

The rapids are bordered to the north by the Robert Moses Parkway and extensive industrial development, and to the south by Canadian waters of the Niagara River. In the vicinity of Goat Island, the habitat includes a portion of the Niagara Reservation State Park. The habitat area also includes Tower Island which is located north of the Ontario Hydroelectric project just over the International Boundary in New York Waters (not shown on map).

FISH AND WILDLIFE VALUES:

The upper Niagara River is a unique ecosystem in the western Great Lakes region of New York State. Although Buckhorn Island - Goat Island Rapids comprises a relatively small segment of the river, it contains some extensive areas of undisturbed, natural habitat conditions. Relatively little of this area has been disturbed by excavation or filling, and recreational uses are prohibited. The Buckhorn Island - Goat Island Rapids is part of one of the most important waterfowl wintering areas (November - March) in the northeastern United States, especially for diving ducks. Mid-winter aerial surveys of waterfowl abundance for the ten year period 1976-1985 indicate average concentrations of over 14,000 birds in the upper Niagara River each year (25,371 in peak year), including approximately 8,500 common and red-breasted mergansers (17,470 in peak year), 2,600 goldeneye (8,520 in peak year), 1,900 canvasbacks (5,000 in peak year), and 1,200 scaup (2,306 in peak year), along with lesser numbers of black duck, mallard, bufflehead and oldsquaw. Buckhorn Island - Goat Island Rapids serves as one of the major feeding and resting areas for these birds. Waterfowl use of the area during winter each year is influenced in part by the extent of ice cover throughout the region. Concentrations of waterfowl also occur in the area during spring and fall migrations (March-April and October-November, respectively). A colony of common terns (T) is located on Tower Island. In 1986 and 1987, respectively, 159 pairs and 86 pairs of common terns were observed at this site. A critical feature of this structure is its isolation from mammalian predators. The Buckhorn Island-Goat Island Rapids may also be important for feeding by common terns and ring-billed gulls nesting near Buckhorn Island.

In addition to having significant bird concentrations, the Buckhorn Island - Goat Island Rapids is believed to be a very productive area for fish populations in the upper Niagara River. However, relatively little is known about the fisheries resources of the area because of the extreme river conditions which preclude most research activities. The rocky shoals and swift currents provide highly favorable habitat conditions for spawning by smallmouth bass, which are abundant in the area. The importance of the rapids to other fish species has not been documented. Due to the restricted access to this area, recreational fishing is primarily from shoreline areas, and is only of local significance.

IMPACT ASSESSMENT:

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:

- destroy the habitat; or,
- 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 include but are 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).

Although not comprehensive, examples of generic activities and impacts which could destroy or significantly impair the habitat are listed below to assist in applying the habitat impairment test to a proposed activity.

An activity that substantially degrades water quality in the Buckhorn Island - Goat Island Rapids would affect the biological productivity of this area. Important species of fish and wildlife would be adversely affected by water pollution, such as chemical contamination (including food chain effects), oil spills, excessive turbidity or sedimentation, and waste disposal. Continued efforts should be made to improve water quality in the upper Niagara River, which is primarily dependent upon controlling discharges from combined sewer overflows, waste disposal sites, and industrial point sources. Spills of oil or other hazardous substances would have very serious consequences for fish and wildlife populations using the area; greater care in handling and preparation of contingency clean-up plans are the best precautions which can be taken to reduce these hazards. Construction of river diversion structures in the area could have adverse impacts on smallmouth bass concentrations, but may benefit other fish and wildlife species. Thermal discharges, depending on time of year, have variable effects on use of the area by aquatic species and wintering waterfowl. Installation and operation of water intakes would have a significant adverse impact on fish populations (through impingement or entrainment) and waterfowl (especially if water levels or minimum flows are altered). Bird species nesting on Tower Island are highly vulnerable to disturbance from April-July. Significant human activity (e.g. fishing, boat landing, or maintenance) on or around Tower Island could eliminate the nesting colony and must be minimized during this period.