

COASTAL FISH & WILDLIFE HABITAT RATING FORM

Name of Area: **Grand Island Tributaries**

Designated: **October 15, 1987**

County: **Erie**

Town(s): **Grand Island**

7½' Quadrangle(s): **Tonawanda West, NY; Buffalo NW, NY; Niagara Falls, ONT-NY**

<u>Score</u>	<u>Criterion</u>
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12	Ecosystem Rarity (ER) Relatively undeveloped warmwater streams, with productive aquatic beds; rare in subzone (Niagara River), but rarity reduced by human disturbance of adjacent lands. Geometric mean; $(9 \times 16)^{\frac{1}{2}}$
0	Species Vulnerability (SV) No endangered, threatened or special concern species reside in the area.
4	Human Use (HU) Reproduction of pike in this area supports the recreational fishery for this species in the upper Niagara River, of county level significance.
6	Population Level (PL) Concentrations of spawning northern pike are unusual in the Niagara River and Lake Erie coastal region. Geometric mean: $(4 \times 9)^{\frac{1}{2}}$
1.0	Replaceability (R) Uncertain of ability to replace.

SIGNIFICANCE VALUE = [(ER + SV + HU + PL) X R]

= **22**

DESIGNATED HABITAT: GRAND ISLAND TRIBUTARIES

LOCATION AND DESCRIPTION OF HABITAT:

The Grand Island Tributaries extend from the Tonawanda and Chippawa channels of the Niagara River into the Town of Grand Island, Erie County (7.5' Quadrangle: Buffalo NW, N.Y.; Niagara Falls Ont.-N.Y.; and Tonawanda West, N.Y.). The fish and wildlife habitat includes portions of the following four major tributary streams on Grand Island, and their associated wetlands: Woods Creek (approximately two miles above Buckhorn Island State Park), Gun Creek (lower three-fourths mile), Spicer Creek (lower three-fourths mile), and Big Sixmile Creek (lower one-half mile). All of these streams are slow, meandering, and less than 6 feet deep, with heavily silted and debris-strewn bottoms. The Grand Island Tributaries are intermittent, with flow rates nearly undetectable except during periods of heavy runoff. The upper reaches of these creek systems drain very flat agricultural and residential land, resulting in relatively poor water quality. A steep drop of approximately 3-6 feet occurs on several of these streams, which may produce a barrier to upstream movement of fish, especially at times of low flow. Depths in the downstream sections are subject to rapid water level fluctuations in the river, caused by downstream water withdrawals for hydroelectric power and industrial uses. Also included with these streams is an approximate 10 acre wetland which opens directly into the Niagara River in Beaver Island State Park.

The extent of development along each of these creeks is variable. The area near the mouth of Big Sixmile Creek has been markedly altered to form a small boat harbor with a capacity for about 100 boats. The area above the marina development continues to provide spawning habitat during spring flooding, despite the fact that access to this area is culverted. Woods Creek, which flows into a large marshland at Buckhorn Island State Park, is bordered by agricultural and low density residential development. The lower portion of Gun Creek appears to have been channelized, perhaps in the early 1940's, and there has been a considerable amount of bulkheading, dock construction, and residential development near the mouth. Spicer Creek contains a well preserved stretch below East River Road, although the segment immediately upstream of this has been altered where it flows through a golf course. The Beaver Island wetland contains some high quality aquatic beds, but the surrounding land has been modified to create open lawn areas in the State Park.

FISH AND WILDLIFE VALUES:

The Grand Island Tributaries are typical of the majority of Niagara County stream ecosystems, but are the least developed of those which drain into the upper Niagara River. Despite some alterations by man, these creeks and wetlands still contain some valuable fish and wildlife resources that are unusual in this segment of New York's coastal area. The five areas which comprise this habitat are an integral part of the upper Niagara River ecosystem, providing important spawning and nursery areas for warmwater fish species, especially northern pike. Studies of Woods, Gun, and Big Sixmile Creek during the mid-1970's determined that these areas contained significant concentrations of spawning northern pike from February through April, with many remaining in the creek until July. Habitat conditions in Spicer Creek and the Beaver Island wetland are similar and provide additional spawning areas for this species. The Grand Island Tributaries appear to be critical to the northern pike populations in the river and perhaps Lake Erie, since scant evidence of river spawning was found at the time of the study. Other fish species inhabiting these creeks include black crappie, brown bullhead, rock bass, white sucker, smelt, and muskellunge. For the latter species, the Grand Island Tributaries are important nursery areas for one-year-old fish, even though spawning occurs in the main river channel. Due to the relatively small size and limited accessibility of the Grand Island Tributaries, fishing pressure in these areas is not significant. However, reproduction of pike in this area supports the recreational fishery for this species in the upper Niagara River, of county level significance. Some locally significant wildlife use of these areas may occur, including nesting by mallard and wood ducks, feeding or resting by migrant waterfowl, and year-round habitation by furbearers, such as muskrat and raccoon.

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.

Any activity that degrades water quality, increases temperature or turbidity, reduces flows, or eliminates aquatic beds in the Grand Island Tributaries will adversely affect the fisheries resources of the upper Niagara River. Operation of hydroelectric plants and the Lake Erie ice boom may have eliminated northern pike spawning areas from within the river, by altering natural river flows and thermal patterns; the entire population of this species now appears to be dependent on tributary habitats for reproduction. Dredging, filling, bulkheading, and clearing of natural vegetation or disturbance of the banks along these streams could affect northern pike spawning habitat. Development of additional motorboat access to the river from these areas would also induce secondary developments causing additional impacts on the fisheries resources. Discharges of stormwater runoff containing sediments or chemical pollutants (including herbicides and insecticides) will also result in adverse impacts on fish populations. Any disturbance of the habitat between early February and July would be especially detrimental. Although the extent of upstream movement by pike in these creeks is not well documented, barriers to fish migration, whether physical or chemical, could have a significant effect on fish populations in the Grand Island Tributaries and the Niagara River. Substantial opportunities for habitat improvement activities exist in these areas, including measures to improve water quality, elimination of barriers to fish movements, and restoration or enhancement of northern pike spawning habitats.