Habitat Enhancement and Restoration Fund
Project Proposal

Niagara River Fish Attraction Structures – Phase II

Project Sponsor:

New York State Department of Environmental Conservation,
Region 9 – Division of Fish, Wildlife and Marine Resources
Timothy DePriest, NYS DEC, 716-851-7010, ttdeprie@gw.dec.state.ny.us

Project Location:

Five separate locations on the bed of the upper Niagara River, owned by New York State and administered by the Office of General Services, Albany, NY.

Three of the proposed structures will be located in near-shore areas and two will be located in mid river locations. Site locations (see attached map) are based on several factors, including: current velocities, river bottom substrates, use by anglers, and proximity to existing habitat features.

Project Description:

The Niagara River is classified as a Great Lakes Area of Concern (AOC) due to several identified beneficial use impairments, including loss of Fish and Wildlife habitat. One reason for the loss of habitat is that the Niagara River has been maintained as a commercial navigation channel for many decades, which has resulted in the loss of habitat structure in areas that have been subject to maintenance dredging. Development of near shore areas and shorelines has also resulted in a loss of habitat structure.

Structural aquatic habitat is fairly simple to create by the placement of large rock and woody debris that break up river currents to provide shelter for adult fish and areas for young fish to escape predation. In 2008 the New York Power Authority constructed four fish attraction structures (FAS) to meet their obligations established in the federal re-licensing agreement for the operation of the Niagara Power Project. Based on first year post-project monitoring, the FASs have performed well in that they have maintained structural integrity, attracted large numbers of adult and juvenile fish, and caused deposition of substrate that has potential to support growth of submerged aquatic vegetation (NYPA .

The original project utilized four different designs located in variable water depths, with the intent of determining which approach provided the best results. The goal of the proposed project is to replicate the design(s) that has the best

performance. Based on monitoring data, the saddle back (rock wing) had the best results to date by attracting 75-100 Small Mouth Bass and creating a sediment deposit extending over 20 feet downstream that will continue to increase in size and provide rooting substrate for aquatic vegetation. The stone groin also had desirable results (Joe Galati, personal communication) and is a good candidate for replication. All structure designs will use the previously engineered drawings used by NYPA for the completion of the 2007 project (NYPA, 2008)

The requested grant will provide funding for four additional structures that will constructed based on existing engineered designs from the previous project. The construction entails movement of project materials and equipment via barge to the pre-determined project locations in the river. The rock and woody debris are installed by a tracked excavator with the aid of side-scan sonar to guide the exact placement of materials. Construction will be completed by a licensed contractor with demonstrated experience with and ability to meet project requirements.

As with the original project, success is based on the continued structural integrity of the structures, amount and type of fish utilizing the structures, and other benefits such as sediment deposition and growth of aquatic vegetation near the project sites. The monitoring of the proposed project can be incorporated easily into the monitoring schedule of the existing project, which is scheduled for repeat monitoring visits in 2013 and again in 2019.

This project, once complete would meet the HERF funding criteria of:

- Has a strong scientific basis because monitoring of existing FAS project has shown positive results in achieving project goals.
- Feasible from a cost/probability of success perspective for the same reason as above
- Is consistent with resource management plan to increase fishery resources and habitat in the Upper Niagara River (DEC, Niagara AOC RAP)

Overall Project Goals

The fish attraction structures are intended to accomplish 2 goals:

1. Improve the quality of the sport fishery by providing additional habitat the meets the specific life stage requirements of species of sport fish such as smallmouth bass, yellow perch, and muskellunge. These requirements include refuge for juvenile fish to escape predation, hydraulic cover for adult fish to conserve energy in swift currents, and substrate that supports lower trophic level productivity.

2. Improve angling through locating the structures in areas that are currently frequented by anglers both on shore and from boat. Sport fishing is a highly popular recreational activity on the Niagara River, and by improving the quality of the angling experience

local and visiting anglers will continue to regard the Niagara river as a valuable natural resource and therefore support conservation efforts.

Location Specific Project Details

Site A: Squaw Island, City of Buffalo

Squaw Island is a popular shore fishing destination for many urban anglers because of its close proximity to residential neighborhoods and improved pedestrian access. It is also located in one of the high velocity sections of the river that has substantial shoreline modifications that have eliminated natural near shore habitat.
The modifications typically consist of vertical stacked stone or steel sheet pile bulkheads that create deep, fast current conditions where there would normally be shallow, low velocity conditions.

The most abundant sport fish caught by anglers here are Small mouth bass, yellow perch, and rainbow trout (DEC, 2002; NYPA, 2004). Angling catch rates have been recorded at this site through two separate creel surveys by DEC (2002) and NYPA (2004) which provides a good set of baseline data to compare future catch rates after habitat improvements have been implemented.

Since the velocities at this point in the river are relatively swift, the best approach to a FAS design is the boulder field. The goal here is create an area that will attract and hold fish in the near shore are that can be reached by shore anglers. Specifically, there is a popular shore fishing area at the top of a steel sheet pile bulkhead array just upstream of the International RR Bridge. The section of river is approximately 360 feet long, and the distance from the shore to the international boundary is approximately 165 feet. The proposed boulder field will occupy the river bed from a distance of 10 feet to 30 feet from the edge of the sheet pile for the entire 360 foot section. Water depths in this section are greater than 20 feet, providing at least 14 feet of clearance between the top of the boulder field and the low water elevation. There is no federal navigation channel in this section of river.

Site B: Aqua Lane Park, Town of Tonawanda

This site is very similar to the Sqaw Island site in that is a popular shore fishing area and is in swift velocity section of river with steel sheet pile bulkhead treatment on the shoreline. The water in this section is in the 6-20 foot range. The proposed design in this section is also a boulder field approximately 400 feet long by 20 feet wide, set 10 feet off

the edge of the bulkhead. The outside edge of the boulder field would be approximately 150 feet from the edge of the federal navigation channel.

Site C : Ferry Landing, Grand Island

A rock wing or saddleback design has been chosen for this location. The site is approximately 300 feet off shore from a historic ferry landing on Grand Island that is on a parcel of land that DEC has targeted for acquisition. The plans for the site are for shore fishing access and car top boat launching. The location of the structure is in approximately 20 feet of water, providing at least 15 feet of clearance to the water level. The location is also approximately 100 feet from the navigation channel.

Site D : Fisherman's Park, North Tonawanda

This site is the proposed location for another rock wing structure that is approximately 300 feet off shore in about 15 feet of water. It is about 225 feet from the navigation channel and provides about 10 feet of depth to the top of the structure.

Site E : Gratwick Park, North Tonawanda

This structure will replicate the shallow water stone groin structure that was installed by NYPA in 2007. The goal will be place the structure as close to the newly constructed fishing pier as possible in a minimum of 10 feet of water.

Proposed Project Budget – Niagara River Fish Attraction Structures – Phase II

	Pre-construction Studies (A)	**Design (B)**	**Construction/ Implementation (C)**	**Annual Operation and Maintenance (D)**	**Monitoring and Reporting (E)**	**TOTAL (A+B+C+D+E)**
Total Cost						
Materials (inc. delivery)	$	$	$ 52,000	$	$	$ 52,000
Mobilization	$	$	$ 48,000	$	$ 10,000	$ 58,000
Construction	$	$	$ 100,000	$	$	$ 100,000
Overhead	$	$	$	$	$	$
Total Cost:	**$**	**$**	**$**	**$**	**$**	**$**
Contingency†						
Percent	%	%	%	%	%	
Amount	$	$	$	$	$	$
Total Cost with Contingency:	**$**	**$**	**$**	**$**	**$**	**$**
Cost Sharing	$	$	$	$	$	$
Funding Requested: *(Total cost with Contingency minus cost sharing)*	**$**	**$**	**$ 200,000**	**$**	**$ 10,000**	**$ 210,000**

Permitting and Authorizations

It is anticipated that the proposed project will need to be authorized by the NYS office of General Services since the river bottom is owned by NYS. It is assumed that this activity will be authorized since a very similar project was executed four years ago by NYPA. The project will also have to meet the criteria for consistency with the NYS Coastal management program administered by the NY Department of State, and once again since a prior project of similar scope met the criteria, this one should as well. The project plans will be submitted to the Army Corps of Engineers as a pre-construction notification to be covered under nationwide permit #27 – Aquatic habitat restoration. Since the project is sponsored by NYS DEC, an Article 15 permit will not be required, as all state agencies are exempt from Article 15 permitting requirements. Construction methods and timing will be planned to avoid impacts to Aquatic resources of the Niagara River.

Schedule

Permits and Authorizations:	February 2012
Project Bidding:	February-March 2012
Contractor selection:	May 2012
Construction:	August-September 2012

References

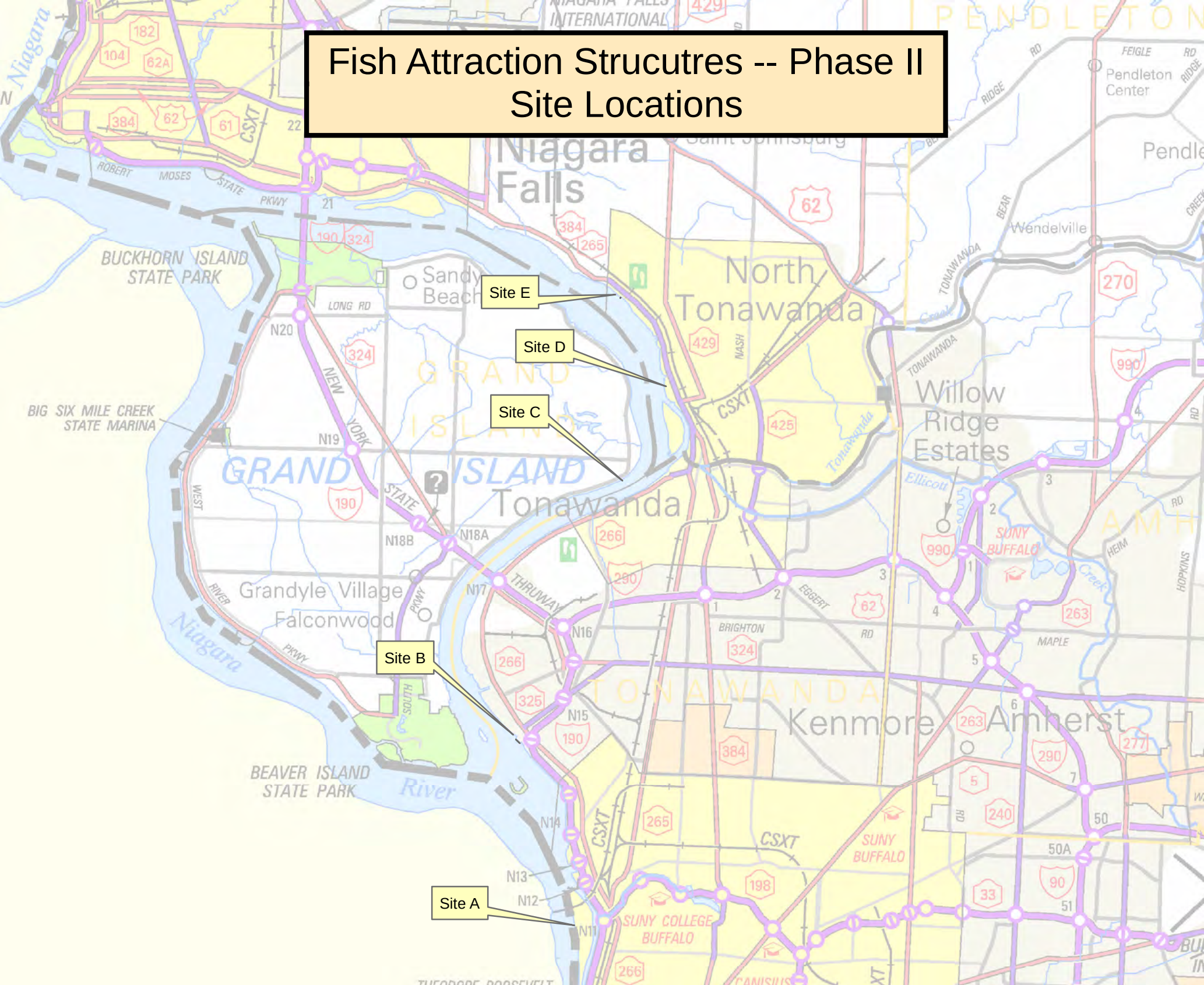
New York State Department of Environmental Conservation, Division of Fish Wildlife and Marine Resources. 2002. *1999 Angler Survey of the Niagara River*. Albany, NY

New York Power Authority. 2004. Recreational *Fishing Survey of the Upper Niagara River*.

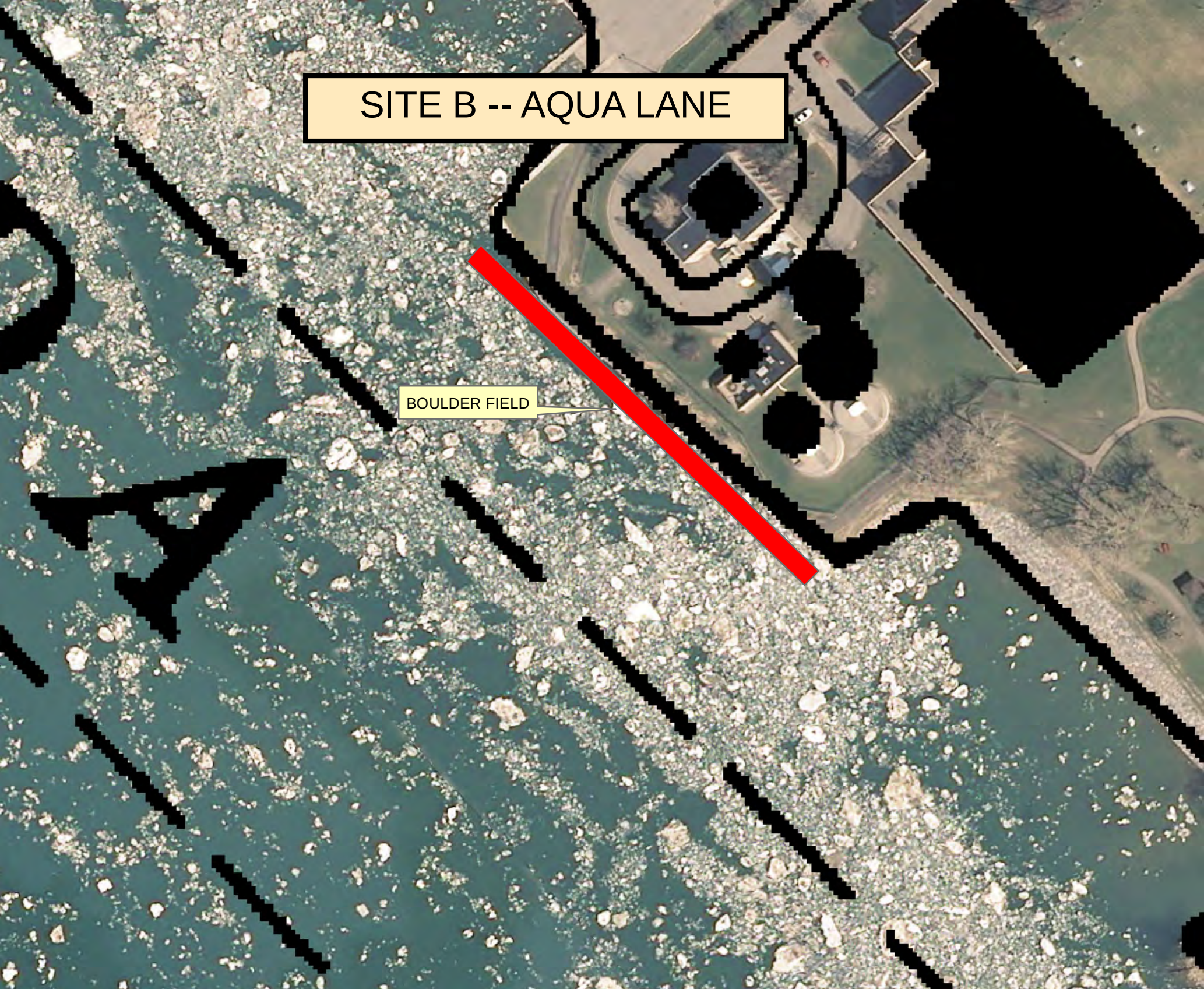
New York Power Authority. 2008. Power point presentation on design of Fish Attraction Structures, Presented at September 17, 2008 meeting of the Ecological Standing Committee at the NYPA Power Vista, Lewiston, NY. Accessed on-line at: http://niagara.nypa.gov/EcologicalStandingCommittee/EcoStanddefault.htm

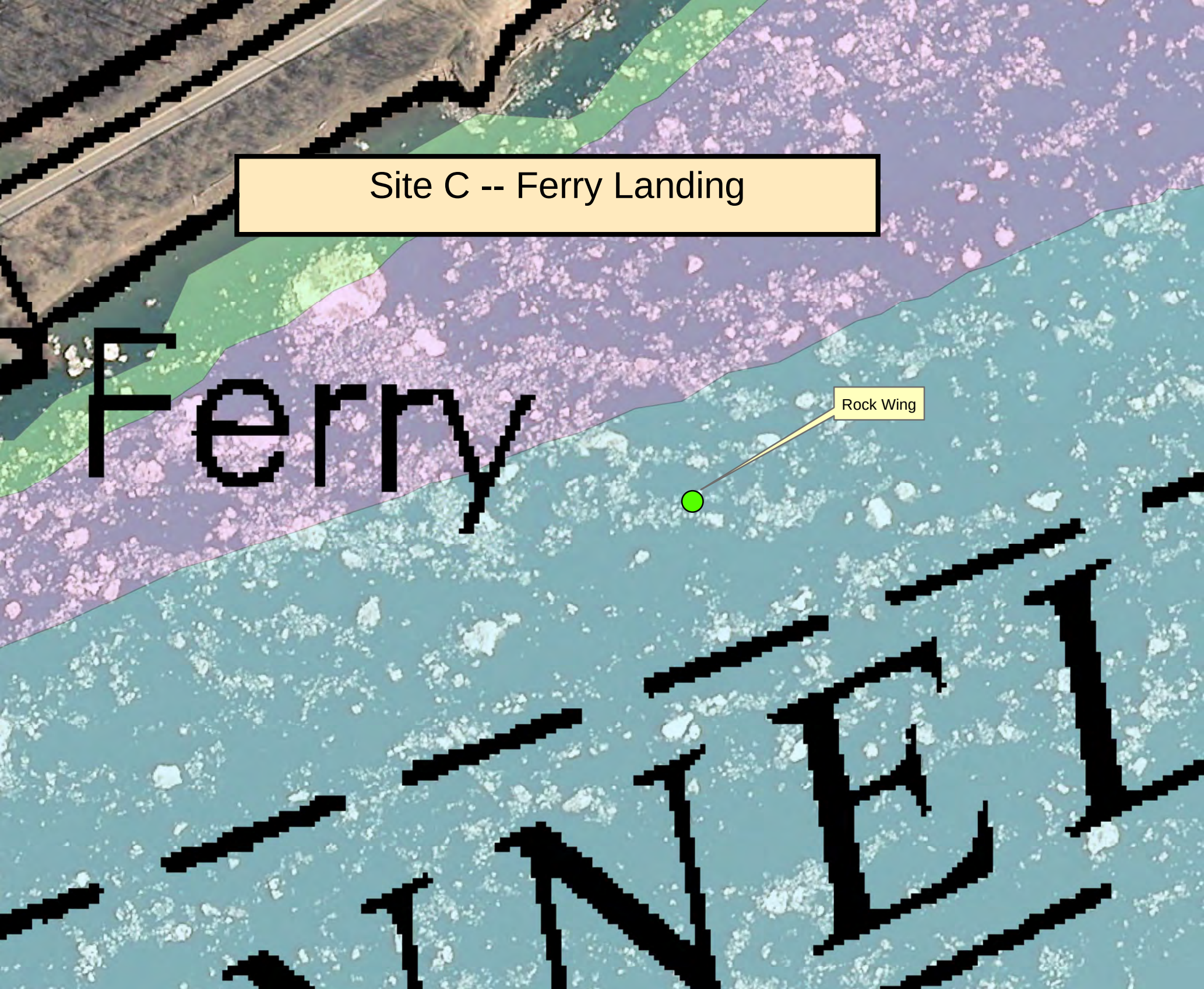
New York Power Authority. 2010. *Fish Attraction Structure Habitat Improvement Project: 2009 Monitoring Report*. Accessed on-line at: http://niagara.nypa.gov/EcologicalStandingCommittee/EcoStanddefault.htm

Fish Attraction Strucutres -- Phase II Site Locations




SITE A -- SQUAW ISLAND
BOULDER FIELD
INTERNATIONAL BOUNDARY

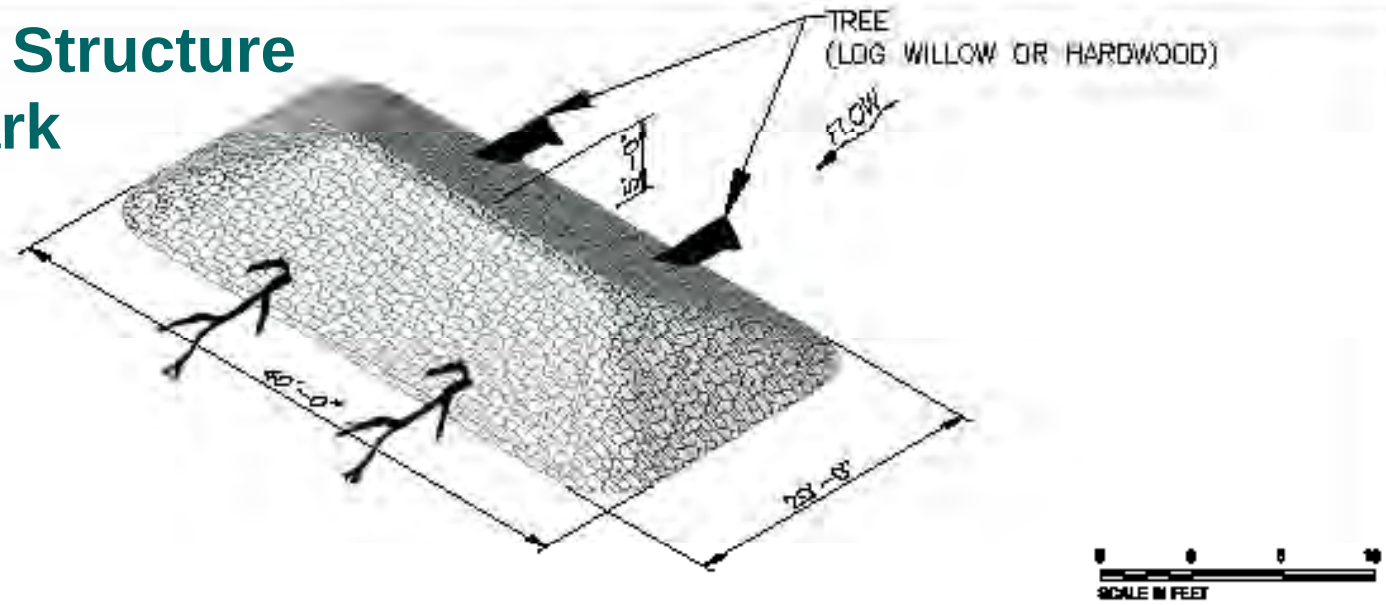

SITE B -- AQUA LANE
BOULDER FIELD

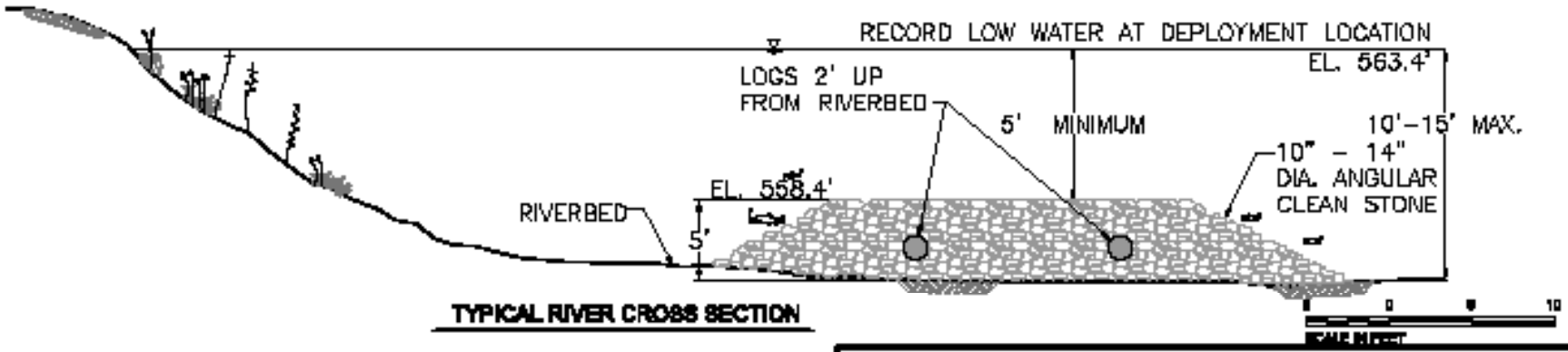

Site C -- Ferry Landing
Ferry
Rock Wing


SITE D -- FISHERMAN'S PARK
Rock Wing
Fishermans
Park
5
C56012
OLD
RR
Turning
Basin


Site E -- Gratwick Park
Stone/log groin

Shallow Water Structure at Gratwick Park





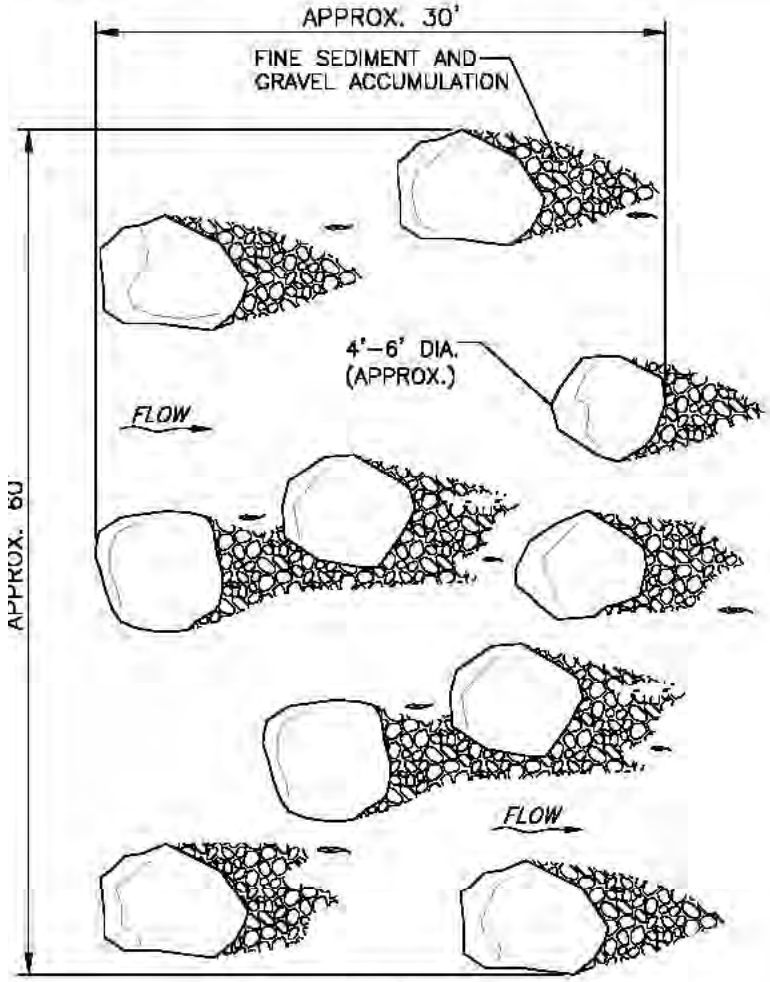
TYPICAL RIVER CROSS SECTION

MATERIAL WORKSHEET	
STONE	10"–14" DIA. ANGULAR
LOG WILLOW OR HARDWOOD	2
VOLUME (FT^3)	1730±
FOOT PRINT (FT^2)	800±

New York Power Authority

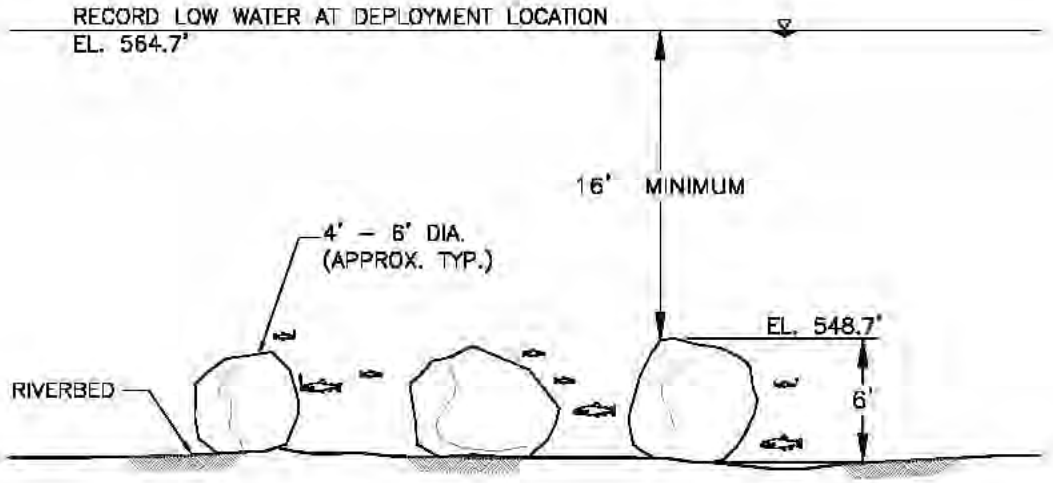
SHEET 1

NEW YORK POWER AUTHORITY
NIAGARA POWER PROJECT (FERC NO. 2216)
HABITAT IMPROVEMENT PROJECT
SHALLOW WATER
FISH ATTRACTION STRUCTURES
PROTOTYPE 1



TYPICAL PLAN OF BOULDER FIELD

NOTES: 10 BOULDERS PER FIELD



TYPICAL RIVER CROSS SECTION

5 0 5

SCALE IN FEET

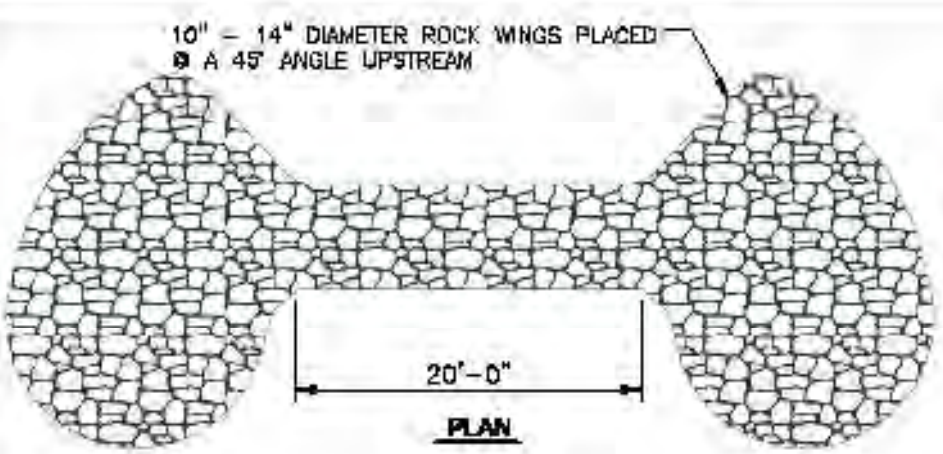
MATERIAL WORKSHEET	
	BOULDER FIELD
BOULDERS	4'–6' DIA. (QTY. OF 10)
VOLUME(FT^3)	1130±

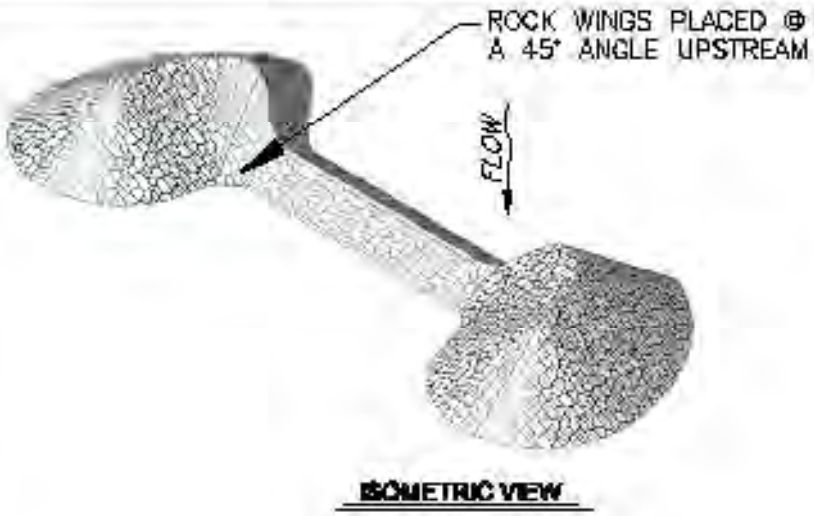
New York Power Authority

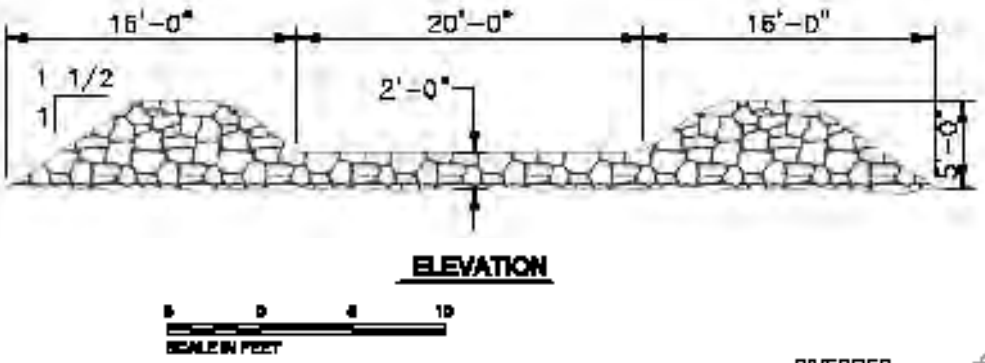
SHEET 2A

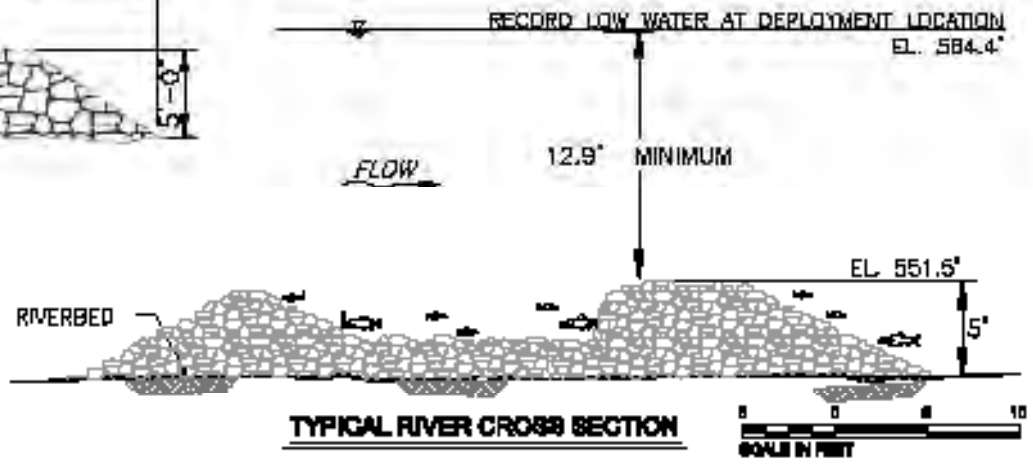
NEW YORK POWER AUTHORITY
NIAGARA POWER PROJECT (FERC NO. 2216)
HABITAT IMPROVEMENT PROJECT
DEEP WATER
FISH ATTRACTION STRUCTURES

Rock Wing – Upstream of South Grand Is Bridge









MATERIAL WORKSHEET	
	ROCK WING
STONE	10"–14" DIA.
VOLUME(FT³)	1255±
FOOT PRINT(FT²)	653±

New York Power Authority

SHEET 29

NEW YORK POWER AUTHORITY
NIAGARA POWER PROJECT (FERC NO. 2216)
HABITAT IMPROVEMENT PROJECT
DEEP WATER
FISH ATTRACTION STRUCTURES
PROTOTYPE 2