Chapter 1 Project Background and Methodology

1.1 Background

The Niagara River is a regionally and globally significant Great Lakes connecting channel and one of the most historically biodiverse river corridors in North America. Niagara's falls, rapids, islands, gorge, wetlands, meadows, and woodlands support not only an abundance of fish and wildlife species, but also a rich diversity of plant life adapted to the many microclimates afforded by its unique geologic and hydrologic features. These features shaped the settlement and economy of Western New York. Although many ecological values were lost or compromised in the industrialization process, the river corridor can be reclaimed as the region's economy transitions from "rust to blue."

The framework for this transition has been developing over the past 30 years, at least since the 1987 Great Lakes Water Quality Agreement between Canada and the United States committed both countries bordering the Great Lakes (and Niagara River) "to restore and maintain the chemical, physical, and biological integrity of the waters of the Great Lakes ecosystem" (IJC, 1987).

Buffalo Niagara Riverkeeper's *Niagara River Greenway Habitat Conservation Strategy* (Strategy) is anchored in many of the goals and programs that relate to this purpose, including the ecosystem criteria of the Niagara River Greenway Plan, the habitat-related goals of the Niagara River Remedial Action Plan (RAP), the fish community objectives of the Great Lakes Fishery Commission, and the conservation initiatives of the New York State Comprehensive Wildlife Conservation Strategy. The first two of these programs were especially instrumental in the Strategy's development and merit further explanation here.

The Niagara River Greenway corridor was established in 2007 as part of the Niagara Power Plant relicensing process. Compensations from the New York Power Authority to Niagara communities in return for 50 more years of operating its hydroelectric plant on the river led New York State, in 2004, to amend the parks, recreation and historic preservation law to establish a Niagara River Greenway Commission. The Commission was tasked "to complete . . . a vision for the Niagara River corridor of a necklace of open space and conservation areas spread along the river" (N.Y. PARKS REC. & HIST. PRESERV. Law Sec. 460,39.01-03). Over the next few years, a Greenway Plan was developed, and by early 2007, all 13 towns, cities, and villages bordering the Niagara River had adopted the plan. Funding from the Power Authority for projects consistent with the Greenway Plan is awarded by grants through four standing committees. One of these, the Greenway Ecological Standing Committee, provided the funding for this Strategy based on the need to assess specific biodiversity features and threats as well as identify opportunities that will advance the implementation of conservation projects within the Niagara River Greenway.

The Strategy also addresses some of the habitat restoration goals outlined in the Niagara River RAP. As one of 43 Great Lakes toxic hot spots or Areas of Concern (AOCs) identified in the 1987 Great Lakes Water Quality Agreement, the Niagara River has both a Canadian and a US RAP that have defined the major ecological problems or "Beneficial Use Impairments" (BUIs). On the US side, the Niagara River RAP is led by the New York State Department of Environmental Conservation (DEC) with the assistance of a Remedial Action Committee consisting of environmental, industrial, sportsmen, academic, community, and local government representatives. The DEC requested Buffalo Niagara Riverkeeper to help define

measurable targets and site-specific habitat restoration action plans related to the Loss of Fish and Wildlife Habitat BUI using the analytic framework of the Greenway Strategy.

Thus, an important component of the Strategy is that it supports, connects, and advances a number of important restoration goals already in play for the Niagara River region. These include:

- Conserve and restore native fish and wildlife biodiversity and habitats to achieve and sustain resilient ecosystems and vibrant economies (DEC, 2013);
- Extend Olmsted's Legacy: achieving Frederick Law Olmsted's vision of a necklace of parks and open spaces along the length of the river to build a legacy for future generations (Wendel and Duchscherer, 2007);
- Restore natural hydrology including stream/floodplain connectivity and removal or remediation of barriers to flow where possible (Buffalo Niagara Riverkeeper, 2008);
- Improve water quality to slight or non-impaired status for aquatic life and habitat (E & E, 2011);
- Protect and maintain Lake Erie and Niagara River near shore habitat and natural shoreline habitat, including beds of submerged and emergent aquatic vegetation (DEC, 2005);
- Increase riparian zone acreage and overall widths of riparian buffers; restore and/or enhance riparian area hydrologic and ecological functions (E & E, 2009); and,
- Protect and maintain existing, functional core areas of mature forests (DEC, 2005).

Finally, although the Strategy is intended to deliver a blueprint for habitat restoration and conservation efforts focused within the Greenway corridor, it is also informed by the *Niagara River Habitat Conservation Strategy,* which provides an essential watershed context and background to the work described in this document (Buffalo Niagara Riverkeeper, 2014b). These two documents should be used as companions in understanding the best-bet opportunities for ecological protection and restoration within the Niagara River region.

1.2 Purpose

The Niagara River region consistently scores "Poor" on water quality, habitat and wildlife indicators, yet it is not always clear exactly why, where, or what could be done to improve habitat quality and ecosystem functionality (Barnes et al., 2009; DEC, 2005; DEC, 2010; DEC, 2012). This brings up a number of questions: What are the major biodiversity features that define the region today and how healthy are they? What are the most significant threats? What are our major natural assets and best bet opportunities for conservation and restoration?

Project Mission Statement:
"Building upon completed and ongoing regional habitat conservation work, restore and conserve native ecological communities and biological integrity by promoting healthy, self-sustaining aquatic ecosystem functions within the Niagara River Greenway."

Without answers to these questions, the funds available for habitat protection and restoration may not be used wisely or sufficiently to meet the region's needs. How do we, in the near term, direct resources towards meaningful projects – projects that will provide the greatest payoff in improving regional habitat quality, ecosystem function, and the ability of native fish and wildlife species and communities to thrive?

The purpose of the Strategy is to answer some of these questions by using the Conservation Action Planning (CAP) model (TNC, 2007), coupled with on-the-ground field data collection, Geographic Information System (GIS) analysis, ongoing consultation with regional experts and community stakeholders, and a detailed database of existing literature. The end result provides a comprehensive and strategic approach to determining the current health of natural habitats and species within the project area and ultimately identifying priority conservation and restoration actions that will have the greatest benefit on the entire Niagara River Greenway. Priority actions include site-specific projects, suggestions for strengthening policies, along with education and outreach initiatives.

1.3 Scope and Methodology

Project Area

The project area used throughout the Strategy focuses on the most critical areas of habitat by combining the Active River Area (ARA) and the Greenway Focus Area (Map 1.1). While using the ARA helped to enhance the mission of the project related to "aquatic ecosystem function," the Greenway Focus Area highlighted parts of the Greenway that were not included in the ARA model like the gorge rim, and also ensured that the Strategy assisted in supporting the vision of the Niagara River Greenway Plan.

Active River Area: A TNC developed modeling tool that identifies areas within a landscape that are dynamically linked to hydrologic function. Components of the ARA include material contribution areas, meander belts, floodplains, terraces, and riparian wetlands.

Greenway Focus Area: Developed through the Niagara River Greenway Plan, the focus area is based on Local Waterfront Revitalization Program and Coastal Zone Management boundaries as defined by Niagara River coastal communities.

Planning Tools

The Strategy uses The Nature Conservancy's (TNC) CAP model (TNC, 2007) to define and assess biodiversity features within the project area. The CAP model provides a logical process for evaluating the health status of biodiversity features in terms of landscape context including size, condition, connectivity, and plant and animal species indicators. The specific indicators used to evaluate health or viability are described in Chapter 2. Use of the CAP model also facilitates the integration of this work with other CAPs that have been completed or are underway in surrounding watersheds with overlapping species and habitats. These include strategies developed for Lake Ontario, Lake Erie, and the Niagara River Corridor in the Province of Ontario, as well as the strategy completed for the Niagara River watershed in New York (Buffalo Niagara Riverkeeper, 2014b).

Data Collection

The project team began by gathering already published data related to habitat and wildlife within the region, creating a database of over 200 documents. In order to fill in some data gaps and determine the baseline condition of habitat within the Greenway, various data collection initiatives were completed including:

- Stream assessments throughout the Greenway completed by SUNY Buffalo State College using the Stream Visual Assessment Protocol (SVAP) developed by USDA Natural Resource Conservation Service. The purpose of the assessments was to collect baseline data on a number of physical, chemical, and biological conditions for streams within the Greenway. Assessments were completed for 348 stretches throughout the Greenway, with locations chosen to represent the various stream conditions that exist within the region. Water quality data collection and QA/QC for a subset of reaches were also included in this effort;
- Barriers to fish along all perennially flowing tributaries to the Niagara River within the Greenway were assessed by Ecology and Environment, Inc. (E & E). Fish barriers are defined as either biological or man-made structures within a stream channel that have the capacity to potentially limit fish (warm and cold water species) passage over, through, or around them, thus hindering regular migratory and seasonal fish movement patterns. Barrier locations were initially

identified through desktop analysis, and later field verified and assessed. For each barrier, data was collected on the type, severity, and species affected by the barrier, and potential mitigation measures were identified;

- Detailed data on several seeps along the Niagara Gorge trail system collected by E & E along with the support of New York State Office of Parks, Recreation and Historic Preservation (OPRHP). The purpose of this effort was to initiate a process for more closely examining seep habitat characteristics and to document them in a fashion that resembles descriptions included in the Ecological Communities of New York State (Second Edition, January 2002); and,
- Detailed site assessments to gather baseline data for all potential site-specific opportunities identified through desktop GIS analysis, and stakeholder input. Results from the assessments were used to determine whether or not the site is a priority for restoration and/or conservation within the Greenway, and make specific recommendations for restoration actions. This effort was completed by E & E biologists.

Desktop Analysis

GIS-based analysis was used to supplement our assessment of baseline conditions and priority opportunities where field work was not possible. In addition to assisting in completion of the CAP process and helping to identify potential site-specific opportunities, both a detailed land cover analysis for portions of the Greenway along with a characterization of shoreline condition were developed through the Strategy.

Publically available land cover datasets for the region exist at a 30-meter resolution (NOAA), providing a baseline for desktop assessment of habitats at a coarse scale given the size of the project area. In order to address this problem, a detailed land cover classification was initiated during Phase 1 of the project. Land covers were interpreted using Light Detection and Ranging (LIDAR) analysis on 2011 aerial imagery flown at 1-foot resolution. Due to budget and time constraints, the focus of this effort was on riparian areas 1,000 feet inland from the mean high waterline along the Niagara River coastline and 500 feet on either side of all main tributaries (excluding those on Grand Island) within the Greenway boundary. Lands within this area were classified into 6 habitat types including wetland, woodland, grass/shrubland, developed areas, beach, and bare earth. A more detailed wetland analysis was also completed as a part of this effort and includes emergent, forested, and shrub wetlands as well as ponds. The complete set of images from this analysis is included in the Technical Report.

The hardening of shoreline within the Greenway is one factor that contributes to the degradation and loss of aquatic and coastal habitat. In order to characterize the condition of shorelines within the Greenway, a desktop analysis was completed using satellite imagery. Where possible, specification as to the type of material constituting a hardened shoreline, and the degree of vegetation for soft shorelines was also included. Although this data should be field checked for accuracy, it provides an overview of areas that could benefit from shoreline habitat restoration and enhancement. The final result is displayed along with the LIDAR land cover classification and more detailed data including a methodology and percentages of both hard and soft shoreline for all waterways within the Greenway in the Technical Report.

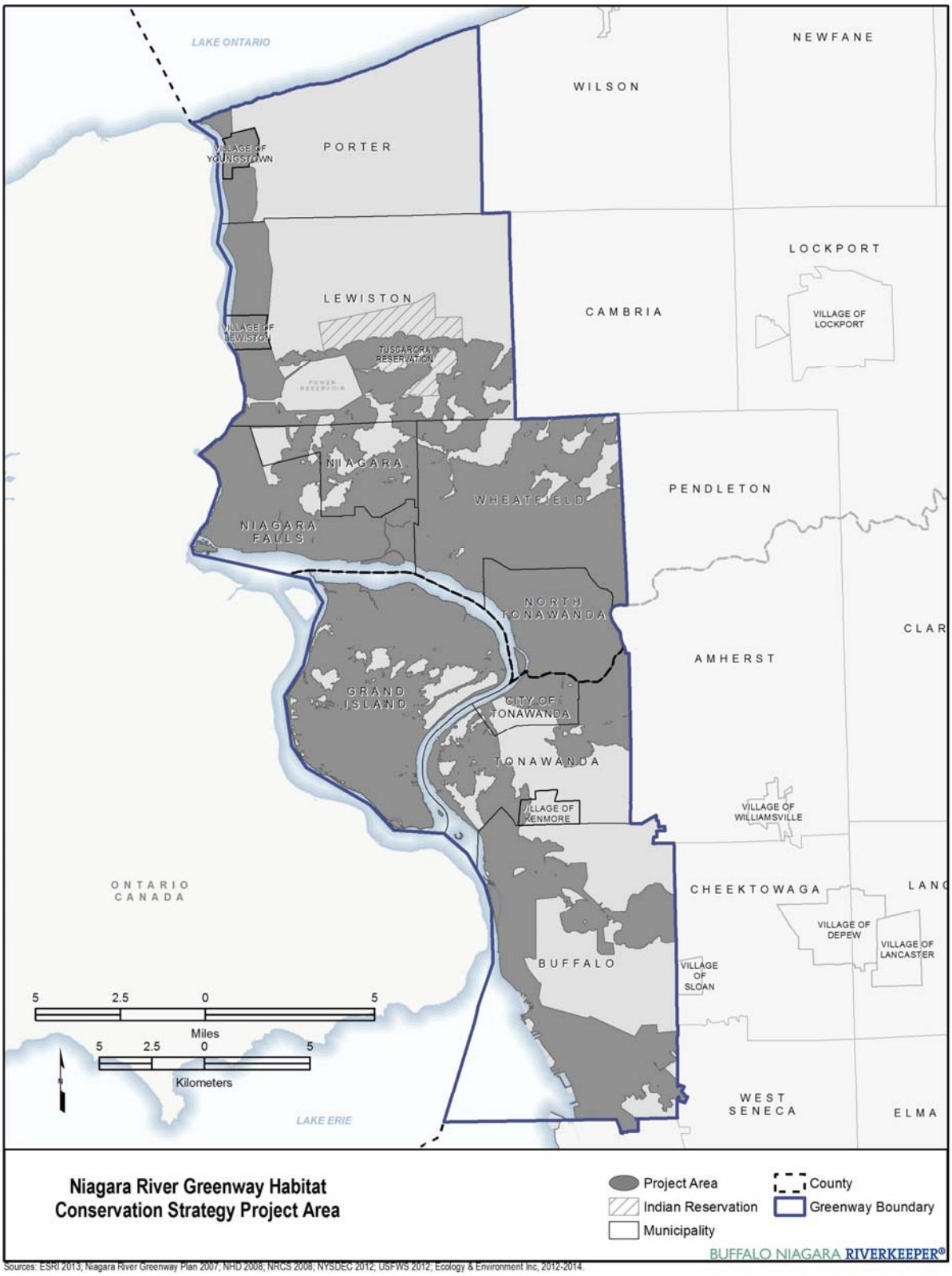
GIS analysis was also used to assess threats and opportunities locationally: for example, to reveal tributary stream segments most vulnerable to runoff from impervious surface, or land areas most favorable for conserving and connecting large tracts of habitat.

Stakeholder Involvement

Stakeholder input is always a critical factor in implementing a regional plan. A bi-national Technical Advisory Committee (TAC) of local and regional fish, wildlife, habitat, hydrology, and ecology experts was convened to guide decision making throughout the development of the Strategy. The project team also attempted to meet with all municipalities in the Greenway to gain insight about current conditions and interests of towns. Other organizations like sportsmen and community activist groups were important stakeholders in providing guidance and information throughout the process as well.

Members of the project team also participated in Niagara River Remedial Action Committee meetings and worked closely with the Loss of Habitat Working Group to develop measurable targets and identify potential projects for priority habitats within the AOC. The work completed throughout the Strategy was leveraged to assist in the development of the Loss of Fish and Wildlife Habitat BUI (Chapter 3, Strategy 17).

Map 1.1 Project Area



Sources: ESRI 2013; Niagara River Greenway Plan 2007; NHD 2008; NRCS 2008; NYSDEC 2012; USFWS 2012; Ecology & Environment Inc, 2012-2014.

1.4 How to Use this Strategy

The following are some of the ways the Strategy can be applied to meet shared conservation goals:

- Review the proposed conservation strategies and actions (Chapter 3) to identify areas of synergy with your conservation goals. The Strategy can be used to inform and refine those goals, support funding applications for conservation projects in an ecosystem or watershed context, educate constituencies, and strengthen and enhance local partnerships;
- Incorporate actions from the Strategy into local and regional plans and land use regulations;
- Review threats assessment (Chapter 2) to help identify critical conservation needs;
- Review municipal action plans (Chapter 4) to help further prioritize actions needed in your focus area (town, village, river corridor, park, backyard, etc.);
- Custom build a “habitat calculator” to assess opportunities and deficits in your municipality using the resources provided in this document and in the Technical Report;
- Review biodiversity feature viability assessments (Chapter 2) to identify further research needs; and,
- Review Chapter 5 for an overview of funding sources for habitat conservation.