APPENDIX A

ONONDAGA LAKE NATURAL RESOURCE DAMAGE ASSESSMENT RESTORATION PLAN AND ENVIRONMENTAL ASSESSMENT

AUGUST 2017

Onondaga Lake Natural Resource Damage Assessment Restoration Plan and Environmental Assessment

Final Report | August 2017

prepared for:

United States Fish and Wildlife Service

State of New York Department of Environmental Conservation

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IEc

INDUSTRIAL ECONOMICS, INCORPORATED

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BTEX	benzene, toluene, ethylbenzene, and xylene
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Federal Code of Regulations
cm	centimeter
COC	Contaminant of Concern
DAP	Damage Assessment Plan
DOI	United States Department of the Interior
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	United States Enviromental Protection Agency
FCA	Fish Consumption Advisory
FONSI	Finding of No Significant Impact
fw	fresh weight
Honeywell	Honeywell International, Inc.
mg/kg	milligrams per kilogram
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act
ng/g	nanograms per gram
NPL	National Priorities List
NRDAR	Natural Resource Damage Assesment and Restoration
NYSDEC	New York State Department of Environmental Conservation
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyls
PECQ	Probable Effects Concentration Quotient
PRP	Potentially Responsible Party
RP/EA	Restoration Plan/Environmental Assessment
USFWS	United States Fish and Wildlife Service
ug/kg	micrograms per kilogram
wb	whole body
ww	wet weight

EXECUTIVE SUMMARY

For decades, mercury and other hazardous substances were released into Onondaga Lake in New York, its tributaries, and associated uplands. Natural resources (e.g., surface water, sediments, invertebrates, fish, amphibians, reptiles, birds, and mammals) have been exposed to and adversely affected by these contaminants. As part of the natural resource damage assessment and restoration (NRDAR) process, the Trustees (the United States Fish and Wildlife Service and the New York State Department of Environmental Conservation) developed this Restoration Plan and Environmental Assessment (RP/EA) in accordance with 43 CFR § 11.82 and 11.93 to inform the public as to the types and scale of restoration that are expected to compensate for contaminant-related injuries to natural resources.

The ultimate goal of NRDAR is to restore, replace, rehabilitate, or acquire the equivalent of injured natural resources and resource services lost due to the release of hazardous substances. Therefore, in accordance with relevant regulations, the Trustees identified three potential restoration alternatives, including a No Action alternative. After a review of the potential project types that would occur under each alternative, specific proposed projects compiled from Trustee- and publicly-generated suggestions, and likely environmental consequences, the Trustees identified Alternative B: Restoration that Satisfies Site-specific Criteria as their Preferred Alternative.

The Trustees published a Draft RP/EA in April 2017 and solicited public input. Public comments have been considered and incorporated into the Final RP/EA, with changes made to this document and a Responsiveness Summary included.

Onondaga Lake

CHAPTER 1 | INTRODUCTION

1.1 PURPOSE AND NEED FOR RESTORATION

For decades, mercury and other hazardous substances were released into Onondaga Lake in New York, its tributaries, and associated uplands. Natural resources (e.g., surface water, sediments, invertebrates, fish, amphibians, reptiles, birds, and mammals) have been exposed to and adversely affected by these contaminants. Over the last few years, Honeywell International Inc. (Honeywell), in cooperation with the New York State Department of Environmental Conservation (NYSDEC) and the United States Environmental Protection Agency (EPA), has removed and isolated contaminated sediments in Onondaga Lake and implemented habitat improvement projects. These remedial actions, while beneficial, do not themselves compensate the public for past, present, and future contaminant-related injuries to natural resources.

Therefore, as part of the natural resource damage assessment and restoration (NRDAR) process, the Trustees developed this Restoration Plan and Environmental Assessment (RP/EA) in accordance with 43 CFR § 11.82 and 11.93 to inform the public as to the types and scale of restoration that are expected to compensate for injuries to natural resources. Consistent with the U.S. Department of the Interior (DOI) NRDAR regulations at 43 CFR Part 11, this RP/EA includes a reasonable number of alternative restoration actions and identifies a preferred alternative.

Onondaga Lake

1.2 ORGANIZATION OF THIS CHAPTER

This chapter discusses the following:

- Trusteeship and compliance with other authorities,
- Coordination with Potentially Responsible Parties (PRPs),
- An overview of Site history and remediation,
- Natural resource damage assessment activities at the Site,

- The relationship between natural resource damage assessment and remedial activities,
- Public participation, and
- The administrative record.

1.3 TRUSTEESHIP AND COMPLIANCE WITH OTHER AUTHORITIES

This RP/EA has been prepared by the Onondaga Lake Trustees. Under Federal law, the Trustees are authorized to act on behalf of the public to assess and recover natural resource damages, and to plan and implement actions to restore, replace, rehabilitate, or acquire the equivalent of injured natural resources and resource services lost due to the release of hazardous substances (42 U.S.C. § 9601 *et seq*.; Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); 43 CFR Part 11). In this case, DOI, as represented by the U.S. Fish and Wildlife Service (USFWS) and NYSDEC, are designated as trustees for natural resources actually or potentially affected by hazardous substances released to the Onondaga Lake area under state and Federal authorities, including, but not limited to, CERCLA; the Federal Water Pollution Control Act (33 U.S.C. § 1251 *et seq.*); Subpart G of the National Contingency Plan (40 CFR § 300.600 *et seq.*); and Executive Order 12580 (52 Fed. Reg. 2923 (January 23, 1987)), as amended by Executive Order 12777 (56 Fed. Reg. 54757 (October 19, 1991)).

Restoration alternatives described in this document will be conducted in compliance with all applicable Federal, state, and local regulations. For example, actions undertaken by the Trustees to restore natural resources or services under CERCLA and other Federal laws are also subject to the National Environmental Policy Act (NEPA; 42 U.S.C. § 4321 *et seq*.), and the regulations guiding its implementation at 40 CFR Parts 1500 through 1517. NEPA and its implementing regulations outline the responsibilities of Federal agencies under NEPA, including requirements for environmental documentation. In general, Federal agencies contemplating implementation of a major Federal action must produce an Environmental Impact Statement (EIS) if the action is expected to have significant impacts on the quality of the human environment. When it is uncertain whether a contemplated action is likely to have significant impacts, Federal agencies prepare an Environmental Assessment (EA) to evaluate the need for an EIS. Therefore, in accordance with NEPA and its implementing regulations, this RP/EA summarizes the current environmental setting, describes the purpose and need for restoration actions, identifies alternative actions, assesses their applicability and potential impact on the quality of the physical, biological,

Bald Eagle

and cultural environment, and outlines public participation in the decision-making process.

Other Federal natural resource and environmental laws and regulations considered during the development of this RP/EA include, but are not limited to: the Endangered Species Act of 1973; the Migratory Bird Treaty Act; the National Historic Preservation Act; the Archaeological Resources Protection Act; the Fish and Wildlife Coordination Act of 1934; the U.S. Fish and Wildlife Mitigation Policy of 1981; Executive Order 11990 on Wetlands; Executive Order 11988 on Floodplains; Executive Order 12580 on Superfund; and the Information Quality Act of 2001.

The major state environmental statute considered during the development of this RP/EA is the New York State Common Law (public nuisance).

1.4 COORDINATION WITH POTENTIALLY RESPONSIBLE PARTIES

Under CERCLA, the parties responsible for releases of hazardous substances may be invited to participate in a cooperative NRDAR effort (43 CFR § 11.32(a)(2)). Cooperative assessments can reduce duplication of effort, expedite the assessment, and accomplish resource restoration earlier than might otherwise be the case. The Trustees signed a Cooperative Assessment and Funding Agreement with Honeywell International Inc. (Honeywell) to facilitate the cooperative resolution of natural resource damages resulting from hazardous substance releases in the Onondaga Lake area (Trustees and Honeywell 2009). To date, Honeywell's active involvement in the damage assessment and restoration planning process includes the following:

- Providing funding and assistance for assessment activities,
- Providing data and relevant literature,
- Participating in Cooperative Assessment Teams, which focused on assessing ecological and recreational losses, and providing input to the Remedial Habitat Plan (Honeywell 2009)[1], and
- Assisting with the identification and benefits assessment of restoration alternatives.

The Trustees also engaged with Onondaga County, which, as another potentially responsible party for releases of hazardous substances and the owner of a substantial amount of the land surrounding Onondaga Lake, provided input into the restoration planning process.

[1] The Habitat Plan can be found at: http://www.dec.ny.gov/chemical/61073.html.

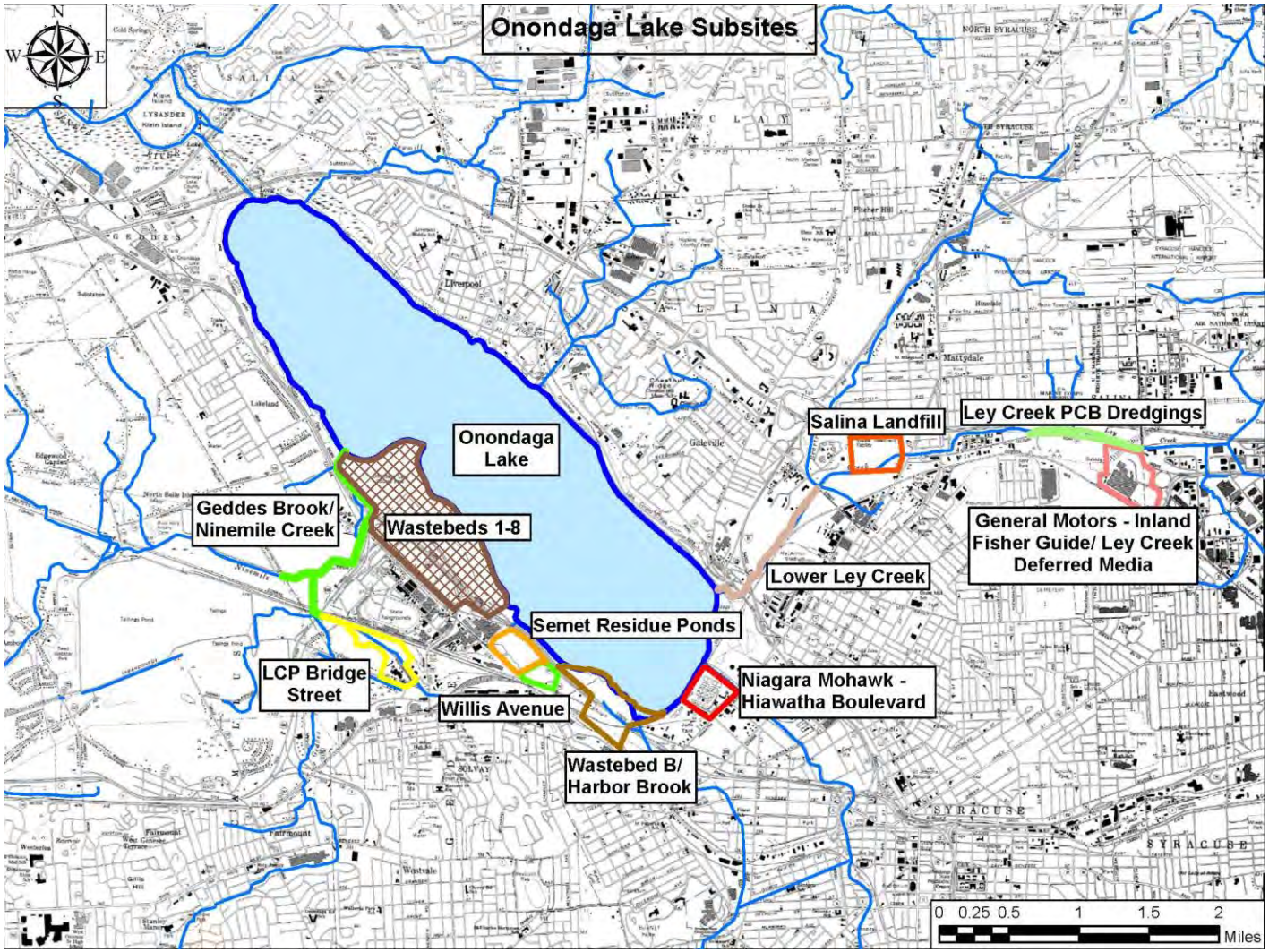
1.5 SUMMARY OF SITE HISTORY AND REMEDIATION

Hazardous wastes from industrial facilities, including Honeywell and its predecessor companies, were discharged to Onondaga Lake from approximately 1881 to 1986 (USEPA & NYSDEC 2005). These releases contained a suite of contaminants, including large quantities of mercury. This extensive contamination led the State of New York to file a lawsuit in 1989 against Allied-Signal, Inc. (Honeywell's predecessor in interest) pursuant to CERCLA and state law seeking remediation, response costs, and natural resource damages. Subsequently, the U.S. Environmental Protection Agency (EPA) placed Onondaga Lake and related areas on the National Priorities List (NPL) on December 16, 1994. In addition, several sites have been listed as "sub-sites" of the Onondaga Lake NPL site, including, but not limited to, the Honeywell LCP Bridge Street, Honeywell Semet Residue Ponds, Honeywell Wastebed B/Harbor Brook, Honeywell Willis Avenue, the Town of Salina Landfill, General Motors - former Inland Fisher Guide facility, Ley Creek Deferred Media, the GM - Ley Creek Dredgings, and the Niagara Mohawk – Hiawatha Boulevard sites (Exhibit 1-1). Together, the Onondaga Lake NPL site and designated sub-sites are referred to as the Site. Industrial activities associated with the Site are discussed in greater detail in the 1996 Damage Assessment Plan (DAP) (Normandeau Associates 1996) and the 2012 DAP Addendum (IEc 2012). Other sources of contamination to the Lake include the Onondaga County Metropolitan Syracuse Wastewater Treatment Plant (Metro facility), the Crucible Materials Corporation (via Tributary 5A), and the former Oil City petroleum facilities (USEPA & NYSDEC 2005).

Pre-remedy contaminant loads to the lake were primarily derived from Honeywell sites on the lake perimeter as well as in its vicinity, with surface water and groundwater pathways delivering much of the associated contamination to the lake. These sites include the Main Plant, which produced soda ash and a variety of benzene products (1884-1986); the Willis Avenue Plant, which manufactured chlor-alkali products and chlorinated benzenes (1918-1977); and the Bridge Street Plant, which produced chlor-alkali products and hydrogen peroxide (1953-1988) (NYSDEC/TAMS 2002).

Dense non-aqueous phase liquid plumes at the Willis Avenue and Wastebed B/Harbor Brook sites also conveyed contaminants of concern (COCs) to the lake. These COCs include, but are not limited to, mercury, BTEX (benzene, toluene, ethylbenzene, and xylene) compounds, chlorinated benzenes, naphthalene, and other polycyclic aromatic hydrocarbons (PAHs), other metals (e.g., lead, chromium, cadmium), and ionic wastes. Honeywell's historical waste discharges to the lake (e.g., via the East Flume) resulted in the significant accumulation of contaminated material in the southwest corner of Onondaga Lake. This "in-lake waste deposit" was estimated to be approximately 11 yards thick and contain over three million cubic yards of material, including some of the most contaminated sediment in the lake. Studies documented the ongoing re-release of contamination from the in-lake waste deposit area, adding to the contaminant load in the Onondaga Lake system (NYSDEC/TAMS 2002).

EXHIBIT 1-1 ONONDAGA LAKE SUPERFUND SITE AND SUB-SITES



The GM Former Inland Fisher Guide Facility on Ley Creek is another known major source of contamination. There are four state and Federal superfund sites related to the contamination emanating from the Fisher Guide facility: 1) the Fisher-Guide plant site, 2) the Ley Creek PCB Dredgings site, 3) the Old Ley Creek Channel site, and 4) the Onondaga Lake Bottom Sediments site. The Fisher Guide plant produced wastes containing elevated levels of polychlorinated biphenyls (PCBs) and heavy metals. It is likely that some of the GM facility wastes were deposited at the Town of Salina Landfill, which leaches contaminants into Ley Creek (elevated levels of PCBs and heavy metals have been found in the sediments of Ley Creek; NYSDEC/TAMS 2002).

To address the ongoing resuspension of existing contamination within the Lake, in 2006 Honeywell entered into a consent decree with the State of New York to clean up the lake bottom consistent with the requirements of CERCLA, the National Contingency Plan and State law. Cleanup was extensive, with the removal of 2.2 million cubic yards of contaminated sediment, and capping that spanned one sixth of the lake bottom's area. Dredging began in 2012 and was completed in 2015. The capping component was completed in 2017.

Dredging boat in Onondaga Lake and bags of dredged sediment in wastebed.

In addition to cleanup of the lake bottom, Honeywell and other PRPs conducted remediation at a number of sites upstream of the Onondaga Lake Superfund site. These are described in the 1996 DAP (Normandeau Associates 1996), the 2012 DAP addendum (IEc 2012), and documents posted on the NYSDEC Region 7 Environmental Remediation Project Information webpage: http://www.dec.ny.gov/chemical/37558.html (e.g., Parsons 2014a, 2014b). Some examples include:

- Excavation, off-site treatment and disposal, and some on-site disposal and capping of PCB-contaminated soils at the Ley Creek PCB Dredgings sub-site (conducted from 1999 through 2000).
- Removal of portions of an on-site sewer system and plugging sewers remaining on-site to address residual mercury contamination at the LCP Bridge Street sub-site (conducted in 2000).

- Demolition and removal of on-site buildings and structures contaminated with mercury at the LCP Bridge Street sub-site (conducted in 2001).
- Cleaning and modification of storm drains for Interstate-690, downgradient from the Willis Avenue and Semet Tar Ponds sub-sites (conducted from 2003 through 2014).
- Installation of a groundwater barrier wall and groundwater collection and treatment system downgradient from the Willis Avenue and Semet Tar Ponds sub-sites (i.e., between the sub-sites and the Lake; conducted from 2006 through 2009).
- Removal of over 100,000 cubic yards of soil and sediment from the Geddes Brook and Ninemile Creek channels and adjoining floodplains, implementation of erosion controls, backfilling of material to appropriate elevations, and the restoration of habitat affected by construction activities. Geddes Brook activities were conducted from 2011 through 2012, and Ninemile Creek actions were conducted from 2012 through 2014.

Geddes Brook Restoration Site

Pending remedial work includes (NYSDEC 2015a, USEPA and NYSDEC 2005):

- The installation of non-aqueous phase liquid recovery wells at the Niagara Mohawk Erie Boulevard site;
- The bank-to-bank excavation of 9,600 cubic yards of Ley Creek sediments containing PCBs, and 15,000 cubic yards of floodplain soil excavation adjacent to operable unit 2 of the General Motors – Inland Fisher Guide site.

1.6 NATURAL RESOURCE DAMAGE ASSESSMENT AND RESTORATION

The ultimate goal of NRDAR is to restore, replace, rehabilitate, or acquire the equivalent of injured natural resources and resource services lost due to the release of hazardous substances. To achieve this goal, the Trustees completed a number of steps outlined in the DOI NRDA regulations (43 CFR Part 11).

1.6.1 NRDAR Activities At This Site

NYSDEC initiated NRDAR activities at the Site in the 1990s, completing a Preassessment Screen Determination[2] in 1994, which determined that the five criteria for conducting a NRDAR (43 CFR § 11.23(e)) were met and it was appropriate for NYSDEC to proceed (NYSDEC 1994). NYSDEC then released a Damage Assessment Plan in 1996 that focused primarily on hazardous wastes produced by Allied-Signal, Inc., Honeywell's corporate predecessor (Normandeau Associates 1996). The 1996 DAP was developed to provide a framework for conducting the damage assessment and to ensure both that the assessment was performed in a systematic manner and the methodologies selected could be conducted at a reasonable cost. Subsequently, the USFWS completed a Preassessment Screen in 2005, confirming NYSDEC's earlier conclusion that it was appropriate for the Trustees to proceed with the NRDAR process. In 2008, the Trustees (Onondaga Nation, USFWS, NYSDEC) signed a Memorandum of Agreement (MOA) that created a Trustee Council for the purpose of coordinating NRDAR activities. In the MOA, the Trustees agreed to together conduct:

- The assessment of natural resource damages…for injury to, destruction of, or loss of natural resources and natural resource services,
- Restoration planning and implementation, and
- Coordination of assessment and restoration activities…with remedial design or implementation activities carried out by or under the direction of Federal and state agencies at the Site (NYSDEC et al. 2008).

From 2008 through 2015, the Trustees (Onondaga Nation, USFWS, NYSDEC) (in cooperation with Honeywell, see Section 1.4) conducted a series of site-specific studies assessing the exposure to and potential effects of site-related COCs on natural resources (e.g., waterfowl, songbirds, amphibians, reptiles, and bats). The Trustees and Honeywell together also conducted a study of the number of recreational anglers and boaters at Onondaga Lake. These studies are discussed in more detail in Chapter 3 and most can be found at:

Great blue heron and mallards - Onondaga Lake

http://www.fws.gov/northeast/nyfo/ec/onondaga.htm.

[2] The purpose of a preassessment screen is to provide a review of readily available information on hazardous substance releases and potential impacts of those releases on natural resources under the trusteeship of Federal and state authorities. The review should ensure that there is a reasonable probability of making a successful claim against the parties responsible for releasing hazardous substances to the environment (43 CFR § 11.23(b)).

In 2013, the Trustees, including the Onondaga Nation, and Honeywell began efforts to identify potential NRDAR-relevant restoration projects. This included compiling the Onondaga Lake Proposed Restoration and Redevelopment Project Database, a collection of a wide range of suggestions and visions for restoration, enhancement, or redevelopment of Onondaga Lake and its tributaries, as described in existing documents and plans. The Trustees also solicited restoration project ideas from the public (see Section 1.7).

In 2015, the Onondaga Nation elected to withdraw from the cooperative damage assessment, indicating that the Nation had been irreparably harmed by the contamination of Onondaga Lake and had come to realize that there is no remedy available through the process that would compensate for their losses. The USFWS and NYSDEC presented draft restoration projects to the Onondaga Nation in April and November of 2016, as well as during the public comment period for this RP/EA on July 14, 2017, inviting comments on project proposals.

1.6.2 Relationship To Remedial Activities

NRDAR is a process that occurs *in addition* to the remedial process conducted by regulatory agencies like NYSDEC and EPA. These two processes have different goals. Remedial action objectives are risk-based, and are developed to protect human health and the environment from further unacceptable harm or risks of harm. Remedies are selected based on evaluation criteria that are used to compare remedial alternatives and may result in contamination remaining in the environment above levels that existed prior to their release. In contrast, the goal of NRDAR is the restoration of resources to their baseline condition (i.e., what their condition would be absent the release). Injuries are assessed over time until that baseline is achieved or expected to be achieved, which may still be years after remedial actions are completed (i.e., post-remedial contaminant levels may be sufficient to cause injury). There are components of NRDAR and remedy that overlap, however. For example, remedial decisions can include consideration of NRDAR restoration objectives. Work to remedy a site may partially or completely restore injured natural resources, which NRDAR analyses take into account. Remedial actions may cause "collateral injury" to habitat, and assessment and restoration of this remedy-induced injury is also evaluated within NRDAR.

For the Onondaga Lake NRDAR, the Trustees have coordinated with the remediation staff at NYSDEC and EPA by reviewing and providing comments on remedial documents such as the Habitat Plan (Honeywell 2009), and identifying supplemental restoration opportunities (e.g., additional fish structures in areas beyond those identified for direct remedial action, invasive species control beyond the period required under the remedy).

1.7 PUBLIC PARTICIPATION

Public participation and review is an integral part of the restoration planning process. The Trustees have coordinated with the public throughout this NRDAR and will continue to

encourage active public participation. Below are some examples of how the Trustees have engaged and encouraged public participation throughout the NRDAR process:

1996 - The NYSDEC released the Onondaga Lake Natural Resource Damage Assessment Plan for public comment. At the request of various parties, the expiration of the public comment period was extended from March 15, 1996, until May 15, 1996.

• 2001 – The NYSDEC hosted four focus groups to discuss recreational impacts as a result of the release of hazardous substances to Onondaga Lake.

• 2009 – Trustees (DOI/USFWS, NYSDEC, Onondaga Nation) issued a press release that documented the formation of a Trustee Council for the Onondaga Lake NRDAR and described the NRDAR process.

• 2009 – Trustees (DOI/USFWS, NYSDEC, Onondaga Nation) developed informational fact sheets and a website page (https://www.fws.gov/northeast/nyfo/ec/onondaga.htm) beginning in 2009. We have continually updated the USFWS website above to include the Preassessment Screen, Damage Assessment Plan, Damage Assessment Plan Addendum, fact sheets, all scientific reports, draft Restoration Plan, and supporting documentation.

• 2011 – Trustees (DOI/USFWS, NYSDEC, Onondaga Nation) presented Onondaga NRDAR information at the Onondaga Lake Watershed Community Forum at the Rosamond Gifford Zoo.

• 2012 – Trustees (DOI/USFWS, NYSDEC, Onondaga Nation) published the Damage Assessment Plan Addendum; posted it to the Onondaga E-mail Listserve and on the USFWS website.

• 2012 – Trustees (DOI/USFWS, NYSDEC, Onondaga Nation) presented Onondaga NRDAR information at a collaborative community outreach effort called Watershed Community Connections at the Genesee Grande Hotel in Syracuse, hosted by the Onondaga Lake Partnership and the Onondaga Lake NRDAR Trustee Council.

• 2013 – Trustees (DOI/USFWS, NYSDEC, Onondaga Nation) developed and published on the USFWS website a document, “Onondaga Lake Proposed Restoration and Redevelopment Project Database” that summarized restoration projects presented in documents such as the 2010 Onondaga Nation’s Vision for a Clean Onondaga Lake, 2010 Onondaga Lake Watershed Progress Assessment and Action Strategies, 1991 Onondaga Lake Development Plan, 1974 Onondaga Lake Environmental Action Plan, 2009 Onondaga Creek Conceptual Revitalization Plan, and the 2012 Syracuse Land Use and Development Plan 2040.

• 2014 – Trustees (DOI/USFWS, NYSDEC, Onondaga Nation) presented information on the Onondaga Lake NRDAR process and requested restoration project suggestions at public meetings, including the Onondaga Lake Watershed Partnership and the Greater

Syracuse Focus Forum meetings. Posted information on our New York Field Office USFWS Facebook page.

• 2014 – Trustees (DOI/USFWS, NYSDEC, Onondaga Nation) solicited restoration project suggestions via the Onondaga Lake News E-mail Listserve managed by NYSDEC with a mailing list of 13,000, an exhibit at the New York State Fair, an article in the Syracuse Post Standard newspaper, and via a letter sent to a wide range of agencies (e.g., nonprofits, local towns, City of Syracuse, Onondaga County, and academic institutions).

• On April 24, 2017, the NYSDEC and DOI/USFWS published the Draft Onondaga Lake Natural Resource Damage Assessment Restoration Plan and Environmental Assessment via a press release and posting to Onondaga Listserve. The Trustees held four public meetings and a public hearing in the Syracuse area between April 27 and June 22, 2017, as follows:

- April 27, 2017, 4:00 PM – 7:30 PM, Onondaga NRDAR Trustee Open House, Honeywell Visitor Center, Syracuse, New York
- May 11, 2017, 11:00 AM – 12:00 PM, Onondaga Lake Watershed Partnership Meeting, Center of Excellence Center, Syracuse, New York
- May 18, 2017, 4:30 PM – 6:00 PM, Onondaga Lake Citizen's Participation Group, Center, Syracuse, New York
- May 19, 2017, 7:30 AM – 8:45 AM, F.O.C.U.S. Forum, City Hall Commons, Syracuse, New York
- June 22, 2017, 5:00 PM – 8:00 PM, Public Hearing and Poster Session, Southwest Community Center, Syracuse, New York

The Trustees initially allowed a public comment period of 45 days on the Draft Restoration Plan, but extended it to 90 days, due to public interest. On July 14, 2017, Trustee representatives from DOI and USFWS also met with Onondaga Nation attorneys to discuss the Draft RP/EA and proposed restoration projects.

Copies of this RP/EA and other documents are available at: http://www.fws.gov/northeast/nyfo/ec/onondaga.htm.

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As restoration progresses, the Trustees may amend this RP/EA and will subsequently notify the public. Amendments, if any, will be publicly available. In the event of a significant modification to the RP/EA, the Trustees will provide the public with

subsequent opportunity to comment. The Trustees will continue public and stakeholder involvement and participation throughout restoration implementation, as appropriate.

1.8 ADMINISTRATIVE RECORD

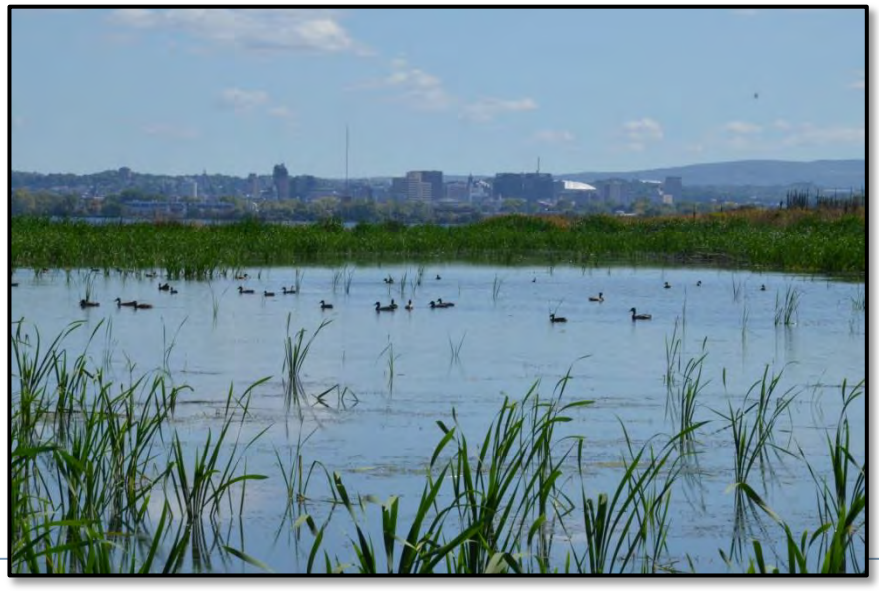
An administrative record, that is, a catalog of all documents Trustees relied upon to develop and make decisions related to the NRDAR, including this RP/EA, is maintained by the USFWS.

CHAPTER 2 | AFFECTED ENVIRONMENT

This RP/EA evaluates restoration options to compensate the public for the natural resource injuries and associated losses in ecological and recreational services resulting from exposure to Site-related COCs. As part of this evaluation, the Trustees assessed the current physical, biological, socio-economic, and cultural resources of the area within which restoration is likely to occur (i.e., the affected area). This information will assist the Trustees in planning future restoration activities and ensure that potential restoration projects are designed to both maximize ecological and human use benefits while minimizing or eliminating project-related adverse environmental consequences.

2.1 PHYSICAL ENVIRONMENT

The affected area encompasses Onondaga Lake, portions of its tributaries (Exhibits 3-1, 3-2, 3-7), and associated wetlands and uplands. Onondaga Lake is located in the northern portion of the Onondaga Lake watershed, which covers 285 square miles in Onondaga and Cortland counties in central New York (Exhibit 2-1). The Onondaga Lake watershed also encompasses the City of Syracuse and the lands of the Onondaga Nation. The second largest lake in the watershed, Onondaga Lake lies at an elevation of approximately 400 feet above sea level, is approximately 4.7 miles long, has a maximum depth of 60 feet, and covers almost 3,000 acres. A single outlet allows water from the lake to drain to the Seneca River, which eventually empties into Lake Ontario. The water level in Onondaga Lake is controlled by a dam located approximately 15 miles downstream in Phoenix, New York (Honeywell 2009).



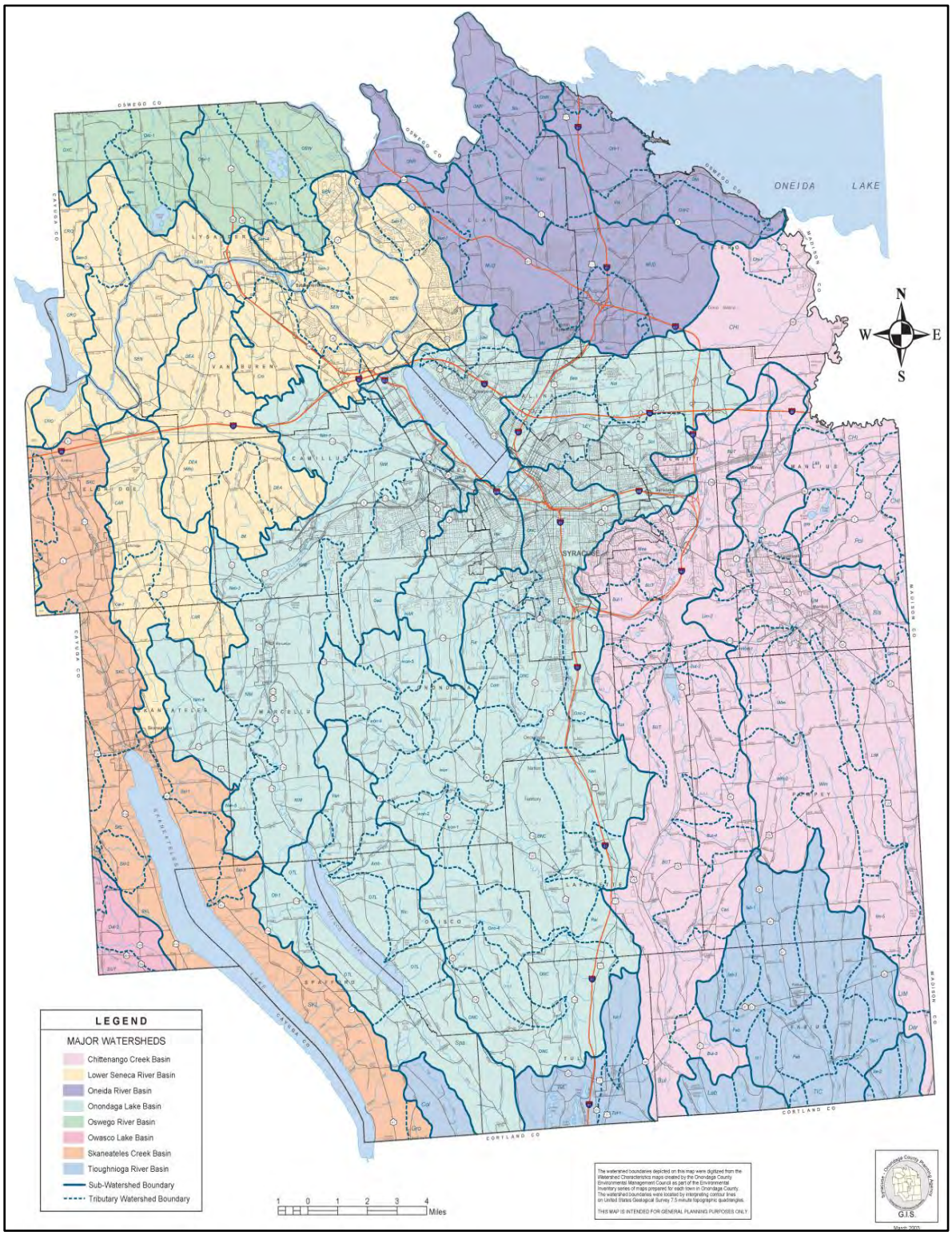
City of Syracuse

Major tributaries to Onondaga Lake include Ninemile Creek and Onondaga Creek, which together account for 70 percent of the water that flows into the lake annually (NYSDEC 2016b, Onondaga Lake Watershed Partnership (OLWP) 2016). Ninemile Creek flows approximately 22 miles from Otisco Lake to Onondaga Lake, and is known for its trout fishery. Onondaga Creek flows 27 miles from Tully, NY, through the Onondaga Nation lands and the City of Syracuse before emptying into Onondaga Lake. Other inputs to Onondaga Lake include the Metropolitan Syracuse Wastewater Treatment Plant, which supplies 20 percent of the lake's inflow, as well as Bloody Brook, Harbor Brook, Ley Creek, and Saw Mill Creek.

Onondaga Creek

Ninemile Creek water trail from Otisco Lake to Onondaga Lake

EXHIBIT 2-1 ONONDAGA LAKE WATERSHED (SYRACUSE-ONONDAGA COUNTY PLANNING AGENCY 2003)



Land use throughout the watershed includes both urban and industrial uses, as well as agriculture in rural locations. Urban and industrial uses are concentrated within the northern portion of the Onondaga Lake watershed, including those areas surrounding Onondaga Lake and the City of Syracuse, while suburban uses, parks, and farmlands account for a greater proportion of the downstream land uses (Syracuse-Onondaga County Planning Agency 1998). To the southeast of Onondaga Lake, the Syracuse Metropolitan Statistical Area spans 3,083 square miles across Cayuga, Madison, Onondaga, and Oswego Counties. As of 2015, Syracuse had a population of approximately 145,000 people (US Census Bureau 2016). The Onondaga Nation lands are located due south of Syracuse and occupy 11.4 square miles, significantly less than their historic territory.

Considering information about land use in the watershed enables the Trustees to assess the conservation landscape, anthropogenic pressures, and the manner in which lands are utilized, all of which may affect the benefits expected from planned restoration. For example, urbanization near Syracuse directly borders Onondaga Lake and decreases the amount of land available for restoration while increasing costs associated with land preservation and restoration.

2.2 NATURAL RESOURCES AND BIOLOGICAL ENVIRONMENT

Natural resources within the Onondaga Lake watershed include, but are not limited to sediment, soil, water (surface water and groundwater), aquatic plants, invertebrates, reptiles and amphibians, fish, birds, and mammals. Wildlife and other biological resources utilize a suite of habitats within the watershed, ranging from open water to wetlands to upland grasslands. Some species, such as the northern long-eared bat (*Myotis septentrionalis*), are of particular concern to the Trustees due to either their threatened or endangered conservation status (see Appendix A), or because they are culturally and/or economically important. For example, certain species (e.g. ducks, smallmouth bass) are caught and consumed through hunting and fishing activities. Varied habitats provide opportunities for recreation, including boating, hiking, and bird watching. This section describes the natural resources within the affected area, with particular attention to the habitat types and wildlife species present.

2.2.1 Habitat Types

A variety of habitats are present within the Onondaga Lake watershed. While historically nearby salt springs contributed to rare habitats such as inland salt ponds and marshes (NYSDEC/TAMS 2002, Honeywell 2009), currently, most of the shoreline is classified as shallow lake (lacustrine littoral) habitat, with deciduous forest wetlands, freshwater wetlands, and shallow emergent marshes surrounding the lake. Twenty-two wetlands regulated by NYSDEC exist within two miles of Onondaga Lake (NYSDEC/TAMS 2002).

Onondaga Lake supports several distinct aquatic habitat types. Waters within the lake become stratified (i.e., layered) during the summer months, with inflows from tributaries mixing into the warmer waters at the lake's surface, but remaining distinct from the cooler waters beneath the thermocline [3] (located approximately nine meters below the surface; Honeywell 2009). Further, Onondaga Lake's distinct nearshore littoral zone supports submerged aquatic vegetation and unconsolidated bottom sediments that contain precipitated calcite deposits. Deeper waters in Onondaga Lake's profundal zone support fish species such as the state-threatened lake sturgeon (Honeywell 2009).

Various habitat types and land uses around Onondaga Lake

Riparian and upland habitats near Onondaga Lake include wooded areas and park lands on the northern edge of the lake, urban development associated with the City of Syracuse along the eastern edge, and historic wastebeds generated by Honeywell's corporate predecessors along the western and southern edges (NYSDEC/TAMS 2002, Honeywell 2009). Soils surrounding the lake consist of materials historically deposited by glaciers, ancient rivers, and unconsolidated (i.e., loose) sediments. Many soils along the western, southern, and eastern sides of the lake have been altered by urban development or placement of soda-ash waste. Residential and urban/industrial lands account for a combined 75 percent of cover within a half mile of the lake, while the rest is characterized by open, forested, or palustrine (i.e., marshes, bogs, swamps) habitat (NYSDEC/TAMS 2002). Further from the lake, floodplain forests, hardwood forests, shrublands, and farmlands are present, in addition to urban and industrial structures.

[3] A thermocline is a steep temperature gradient in a body of water such as a lake, marked by a layer above and below which the water is at different temperatures.

Gizzard shad

White perch

Smallmouth bass

Leopard frog

Green frog

Snapping turtle

2.2.2 Fish

In general, the fish community in Onondaga Lake consists predominantly of warm water species such as gizzard shad, white perch, carp, and freshwater drum, with smallmouth bass and walleye supporting an important recreational fishery (NYSDEC/TAMS 2002). Sampling efforts between 1927 and 1994 found 54 fish species present in Onondaga Lake and its tributaries (NYSDEC/TAMS 2002), while the Onondaga County Department of Water Environment Protection (OCDWEP) documented 46 species from 2000-2008, including the lake sturgeon, a New York State threatened species (OCDWEP 2008). Lake sturgeon were introduced through a stocking effort in nearby Oneida Lake as part of an effort to reestablish the species, and through connected waterways were able to migrate to Onondaga Lake (OCDWEP 2008). Recent water quality improvements due to wastewater treatment upgrades have led to an increased abundance of fish species (OCDWEP 2008).

2.2.3 Reptiles And Amphibians

Reptiles and amphibians have the potential to utilize wetland, riverine, and upland habitats in the Onondaga Lake watershed. In surveys between 1994 and 1997, seven species of amphibians were documented within 250 meters of the lake shoreline, including American toad, grey tree frog, spring peeper, green frog, northern leopard frog, spotted salamander, and eastern newt (NYSDEC/TAMS 2002). Surveys also identified six species of reptiles, including northern water snake, brown snake, garter snake, snapping turtle, painted turtle, and musk turtle (Ducey et al. 1998, NYSDEC/TAMS 2002).

In 2011 and 2012, the Trustees conducted a study of amphibians and reptiles in the Onondaga Lake watershed (Ducey 2014). The thirteen reptile and amphibian species at the lake reflect a viable herpetofauna, but one with fewer species than have been documented in surrounding areas (Ducey 2014). No evidence of successful amphibian breeding within the lake is available, but limited reproduction has been reported for three frog species in one wetland (SYW-6) adjacent to the lake. Ducey (2014) hypothesizes that herpetofaunal abundance, diversity, and successful reproduction may be limited by factors including sediment chemistry (i.e., due to industrial and municipal contaminants), habitat fragmentation, and site modifications associated with urbanization, limited aquatic plants or dense invasive species in wetlands, inadequate upland soils, and lack of corridors to facilitate recolonization and altered water quality.

2.2.4 Birds

Great blue heron

Onondaga Lake is located within the Atlantic flyway, provides habitat for both migrating and resident birds, and is recognized as an Important Bird Area for New York State. More than 100 bird and waterfowl species have been identified utilizing the lake and its shoreline, including bald eagle, great blue heron, American kestrel, wild turkey, common loon, and a number of songbirds. Migratory shorebirds and waterfowl breed and nest in and around the lake, which is a recognized waterfowl concentration area during spring, fall, and winter months (USFWS 2005, NYSDEC/TAMS 2002, Honeywell 2009).

2.2.5 Mammals

Mammalian species, such as shrew, eastern mole, eastern cottontail rabbit, groundhog, gray fox, and white-tailed deer, are found in riparian and wetland habitats similar to those near Onondaga Lake (NYSDEC/TAMS 2002). The Federally-listed endangered Indiana bat occurs in Onondaga County within foraging distance of the lake (USFWS 2005), and the shoreline and surrounding wetlands may support small populations of mink and river otter (Honeywell 2009).

Indiana bat

A complete list of mammal species expected to be found within the affected area is provided in Chapter 3 of the Baseline Ecological Risk Assessment (http://www.lakecleanup.com/publicdocs/docs/08acb31e-cc33-468b-afa9-7ca7e8b9e94b.pdf; NYSDEC/TAMS 2002).

2.2.6 Threatened And Endangered Species

Lake sturgeon

Certain wildlife species have been adversely impacted by environmental stressors (e.g., habitat degradation) to an extent that their long-term viability is uncertain. Many of these species are afforded special protection under Federal and/or state legislation for endangered species. Rare species have been documented within the affected area, notably the Federally endangered Indiana bat (*Myotis sodalis*), the Federally threatened

northern long-eared bat, and the state threatened lake sturgeon. A list of state and Federally listed threatened and endangered species present in Onondaga County is provided in Appendix A. Future restoration actions would need to minimize ecological impacts on these species, and may be designed to specifically benefit these species.

2.3 SOCIOECONOMIC RESOURCES

In Onondaga County, the majority of residents are employed in the education, health, social services, manufacturing, and retail industries (US Census Bureau 2016). In the Syracuse area, the manufacturing industry has been in decline over the last 10 years, while the education, health services, and leisure and hospitality industries have expanded (US Department of Labor 2016).

The population of Onondaga County is about 468,000, and has remained steady over the last few years. According to U.S. Census population estimates, the population increased by about 1,400 from 2010 to 2015 (US Census Bureau 2016). In Onondaga County, racial minorities (defined as all US Census race/ethnicity categories other than white alone) comprise approximately 19 percent of the population, slightly below the national average of 26 percent. Fifteen percent of residents are living below the poverty level, a proportion comparable to the national average (US Census Bureau 2016).

2.4 CULTURAL AND HISTORICAL RESOURCES

Onondaga Lake has played a central role in the cultural history of the Onondaga Lake region. Prior to European settlement and continuing today, the lake and its environment are a central meeting place for the six Nations of the Haudenosaunee, “People of the Longhouse.” For over 1,000 years, the Haudenosaunee Confederacy has existed at Onondaga Lake and on lands that stretched across New York State. The Onondaga people consider the lake and the resources it provides to be sacred. Onondaga Lake is “an intrinsic part of [the Onondaga Nation’s] existence,” once providing water, food, and medicinal plants as well as a place to fish, hunt, play, swim, and learn (Onondaga Nation 2015). The Onondaga people are strong stewards of land, and have a unique cultural relationship and history with the area, including Onondaga Lake, its tributaries, and surrounding lands.

Additionally, historical resources within Onondaga County include 147 properties and 20 historic districts listed as part of the National Register of Historic Places (NPS 2016).

2.5 LANDSCAPE-SCALE ECOLOGICAL STRESSORS

Widespread, complex ecological stressors are causing changes to the ecological landscape of New York. Some of these stressors, such as fluctuating water levels, invasive species, and non-point source pollution, all of which can be exacerbated by climate change, have become both more prevalent and better understood over the last decade. Of particular relevance to Onondaga Lake, the ramifications of invasive species and climate change are presented below as each relates to the ecological function of the watershed.

2.5.1 Invasive Species

Aquatic invasive species have contributed to the degradation of aquatic communities in central New York and the Great Lakes. Hydrologically connected to Onondaga Lake, Lake Ontario contains a number of invasive species, including fish, mollusks, crustaceans, and plants that have entered the Great Lakes since the early 1800s (Domske and O'Neill 2003). Non-native species such as common carp, sea lamprey, round goby, rainbow smelt, alewife, common reed grass, zebra mussels, and quagga mussels have negatively impacted native species through direct predation, competition, and/or habitat alteration. For example, the non-native *Phragmites australis,* or common reed, can rapidly form dense stands of stems that crowd out or shade native vegetation in wetland areas. These dense areas reduce vegetative diversity, alter hydrology, change local topography, and decrease the ability of wildlife to utilize the habitat. Invasive species also negatively impact the local economy by threatening agriculture, forestry, navigation, tourism, recreation, and the fishing industry.

Non-native Phragmites (Common reed grass)

To mitigate these negative impacts, programs have been developed to stop the spread of invasive species within the affected area. For example, NYSDEC developed a statewide plan to manage aquatic invasive species in 2015 (NYSDEC 2015b). Water chestnut is an invasive species of concern in central New York, and recent initiatives have included education, harvesting, and application of herbicides (LaManche 2007). Eurasian watermilfoil is an aquatic invasive species present within Onondaga County, and has been the subject of harvesting and research on potential biological control agents (LaManche 2007).

Changing ecological conditions, such as declining lake levels and increasing air temperature, may increase the vulnerability of natural systems to invasive species and favor their continued spread and proliferation (NOAA 2010). The Trustees will review restoration options for invasive species management and benefits to native species.

2.5.2 Climate Change

Although predicting the impacts of climate change is an inherently complex task, some climate-induced changes are already manifest in central New York and are likely to continue. For example, climate change is likely to affect water budgets in terms of precipitation and air temperature, though the magnitude of these shifts is unclear. New York climate predictions include warmer conditions and an increase in intense precipitation events greater than one inch (NYSERDA 2014). Recent climate assessments have identified impacts that are currently observed in New York State, such as decreased winter snow cover and increased average annual temperatures (NYSDEC 2016a). These altered conditions could affect flow regimes, cause fluctuations in species compositions, and reduce habitat sustainability (e.g., if habitats cannot migrate or adapt to new climate conditions). Precipitation and temperature fluctuations may affect at-risk biological resources in niche riparian and aquatic habitats.

The Trustees will consider the long-term implications of fluctuating climate and climate change adaptation principles (see http://www.dec.ny.gov/regulations/65034.html) when developing a preferred restoration alternative. Although there is a high degree of uncertainty regarding the effects of climate change on restoration, precautionary approaches can be taken to consider a range of possible effects and increase resiliency of NRDA restoration projects.

2.6 SUMMARY

The Onondaga Lake watershed encompasses a suite of habitat types that together support a wide range of plant, fish, and wildlife species. Current land use and socio-economic conditions, combined with increases in urbanization and environmental degradation due to landscape-scale stressors such as climate change and the spread of invasive species, have adversely affected these natural resources. In addition to ecological functions, these natural resources provide recreational, commercial, and cultural services. The Trustees will take these current resource conditions into account when evaluating and planning future restoration.

CHAPTER 3 | NATURAL RESOURCES AND CONTAMINANT-RELATED INJURIES

To understand the scale and scope of necessary restoration, the Onondaga Lake Trustees evaluated available information to inform the severity, magnitude, and extent of injury to natural resources as a result of exposure to hazardous substances released into Onondaga Lake, its tributaries, and associated wetlands and uplands. This Chapter describes the geographic scope within which the Trustees assessed injuries, the contaminants of concern upon which this NRDAR is focused, the pathways of those COCs through the environment, the natural resources that have been injured, and the associated losses in ecological and recreational services.

3.1 ASSESSMENT AREA

A key component in the determination of natural resource injuries is the assessment area, defined as, "the area or areas within which natural resources have been affected directly or indirectly by the discharge of oil or release of a hazardous substance and that serves as the geographic basis for the injury assessment" (43 CFR 11.14 (c)). In this case, the assessment area includes Onondaga Lake, its tributaries, and surrounding wetland and terrestrial habitats that have been exposed to hazardous wastes released from industrial and waste disposal facilities in the area, as described below and illustrated in Exhibits 3-1 and 3-2:

- **Onondaga Lake**, which covers approximately 3,000 acres and is located in a largely urban area near the City of Syracuse, Onondaga County, New York.
- **Tributaries to Onondaga Lake**, including Ley Creek, Ninemile Creek, Onondaga Creek, Harbor Brook, Bloody Brook, Sanders Creek, Sawmill Creek, Iron Brook, Geddes Brook, the East and West Flume, and Tributary 5A. Together these tributaries support approximately 90 acres of aquatic habitat.
- **Wetlands** associated with Onondaga Lake and tributaries, including New York State Wetlands SYW-1, SYW-6, SYW-10, and SYW-18.
- **Uplands** associated with the Lake and the Site, including Wastebeds 1-6, 9-11, and 12-15, along with land surrounding Harbor Brook and along the southeast corner of the lake.

EXHIBIT 3-1 AQUATIC GEOGRAPHIC SCOPE OF ONONDAGA LAKE NRDAR

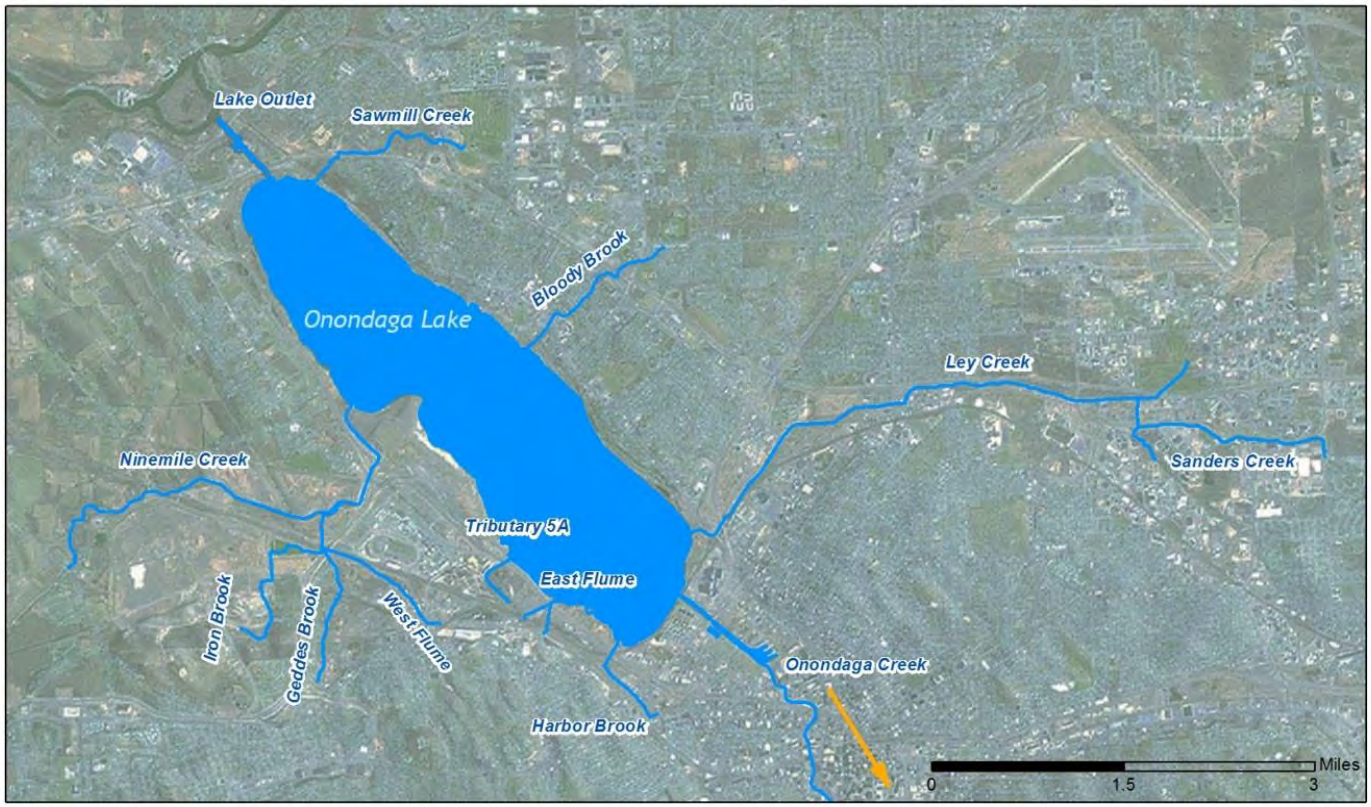
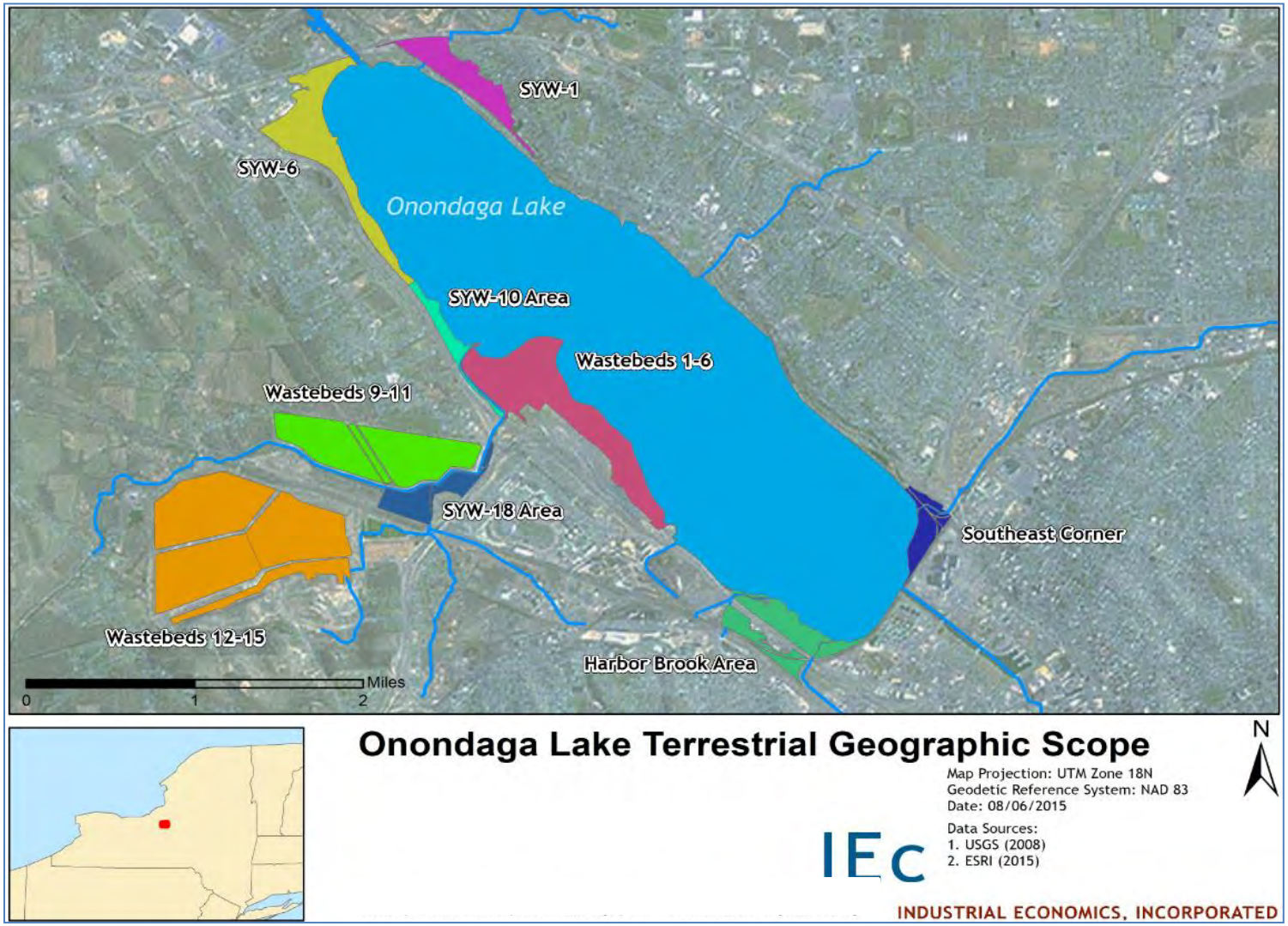


EXHIBIT 3-2 TERRESTRIAL GEOGRAPHIC SCOPE OF ONONDAGA LAKE NRDAR



3.2 NATURAL RESOURCES

The assessment area includes open water (lake and river), wetland, and upland areas in the vicinity of Onondaga Lake and its tributaries. As noted in Section 2.2, natural resources that comprise or utilize these habitats within the assessment area and that are of concern to the Trustees include, but are not limited to sediment, soil, water (surface water and groundwater), aquatic plants, invertebrates, reptiles and amphibians, fish, birds, and mammals (43 CFR § 11.14(z)).

3.3 NATURAL RESOURCE INJURY

The natural resources listed above provide a variety of services. Services are, "the physical and biological functions performed by the resource, including the human uses of those functions, [that result from the resource's] physical, chemical, or biological quality" (43 CFR § 11.14 (nn)). For example, ecological services provided by benthic (i.e., sediment-dwelling) invertebrates include foraging opportunities for fish and birds and nutrient cycling. Similarly, wetland soils provide services by supporting healthy vegetation and diverse plant communities that in turn provide animals with foraging opportunities, nesting or denning areas, and protective cover. Examples of human use services provided by natural resources include opportunities for fishing, boating, and wildlife viewing and appreciation.

Injury has occurred when a resource's viability or function is impaired such that the type and/or magnitude of services provided by that resource is reduced or altered as a result of contamination (43 CFR § 11.14 (v)). Determination of injury requires documentation that there is: (1) a viable pathway for the released hazardous substance from the point of release to a point at which natural resources are exposed to the released substance, and (2) that injury of exposed resources (i.e., surface water, sediment, soil, groundwater, biota) has occurred as defined in 43 CFR § 11.62. The first condition is satisfied based on clear documentation of direct historical discharge of hazardous substances into the lake and tributaries from facilities such as the Honeywell Main Plant, Honeywell Willis Avenue Plant, Honeywell LCP Bridge Street Plant, and the GM Inland Fisher Guide facility (See NYSDEC/TAMS 2002). The second condition is satisfied because: 1) measured and modeled concentrations of COCs in assessment area resources exceed levels at which the scientific literature reports adverse effects on endpoints such as reproduction, growth, and survival, and 2) there is a contaminant-driven fish consumption advisory that impacts human use of fishery resources.

The Trustees identified mercury and PCBs as the primary COCs in the assessment area because they are persistent in the environment (i.e., do not readily degrade), site-specific concentration data and relevant effects literature are readily available, and elevated concentrations have been measured throughout the assessment area.

Mercury does not serve any biological function, and is universally toxic in sufficient concentrations. Mercury can also biomagnify and bioaccumulate through foodwebs, affecting higher trophic level organisms.[4] Even at low concentrations, mercury can cause adverse impacts to reproduction, growth, development, behavior, blood chemistry, vision, and metabolism, and at high concentrations is lethal (Eisler 2000).

PCBs are a class of compounds consisting of 209 chlorinated hydrocarbon chemicals (individually known as PCB congeners). The chemical structure of PCBs allows these compounds to accumulate in the fatty tissues of organisms and, similar to mercury, bioaccumulate and biomagnify through food webs. In organisms, PCBs can cause a range of adverse health effects, including liver and dermal toxicity, teratogenic and other reproductive effects, and neurological effects (Eisler 2000).

Because of the method used to assess natural resource injury to sediment-dwelling organisms, the combined effects of all COCs were accounted for in that analysis (see Section 3.3.1). For other natural resources, however, additional COCs were evaluated with respect to their contribution to injury to natural resources, but corresponding injuries were not quantified due to either limited site-specific exposure data and/or limited information in the literature on the effects of those COCs on relevant resources.

Below is an overview of the natural resource injuries demonstrated to have occurred within the assessment area.

3.3.1 Ecological Losses Resulting From Injury To Natural Resources

To assess the losses in ecological services as a result of natural resource exposure to and injury from Site-related hazardous substances, the Trustees used measured and modeled contaminant concentration data in combination with site-specific and literature-based toxicological study results. Together, these data informed the expected magnitude and severity of the effects of relevant COCs on Trust resources. Based on the DOI NRDAR regulations, the Trustees evaluated injury to sediment-dwelling invertebrates, fish, amphibians, reptiles, soil invertebrates, bats, and birds. These injuries were then assessed on a habitat basis in order to facilitate the development of appropriate habitat-based restoration projects (Exhibit 3-3). Details of this evaluation are presented below by resource.

[4] *Bioaccumulation* is the intake of a chemical and its concentration in the organism by all possible means, including contact, respiration and ingestion. *Biomagnification* occurs when the chemical is passed up the food chain to higher trophic levels, such that in predators it exceeds the concentration to be expected where equilibrium prevails between an organism and its environment.

EXHIBIT 3-3 REPRESENTATIVE RESOURCES BY HABITAT TYPE

HABITAT TYPE	RESOURCE	RESOURCE EXAMPLE
Lacustrine/Riverine	Sediment-dwelling Invertebrates	Chironomids, Mussels
	Fish	Smallmouth bass, Walleye
	Aquatic Birds	Belted kingfisher, Osprey
Wetland/Upland	Soil-dwelling Invertebrates	Spider, Earthworm
	Terrestrial Birds	American robin, Tree swallow
	Reptiles and Amphibians	Northern leopard frog, Painted turtle
	Bats	Indiana bat, Big brown bat

Sediment-dwelling Invertebrates

Chironomid (midge)

The Trustees evaluated injury to sediment using site-specific contaminant concentration data together with amphipod (shrimp-like invertebrates) and chironomid (midges) toxicity tests conducted under the Baseline Ecological Risk Assessment for Onondaga Lake (NYSDEC/TAMS 2002). The toxicity tests related reductions in invertebrate survival and reproduction to contamination in the sediments where these organisms were tested. The degree of contamination was quantified using probable effects concentration quotients (PECQs), which measure the magnitude of adverse effects threshold exceedances for a combined set of COCs, including mercury and PCBs. By understanding the impacts on survival and reproduction of test organisms at different sediment PECQ ranges, the Trustees were able to use available PECQ data to estimate reductions in survival and reproduction of sediment invertebrates at sampling locations throughout the lake. These data were interpolated using Thiessen polygons[5] to model the likely toxicity of sediments across the entire lake bottom (Exhibit 3-4). Results indicate that injury was widespread across the lake, with expected reductions in ecological services at PECQs above 0.5 (Exhibits 3-4, 3-4A). Because PECQ data were not available for Onondaga Lake tributaries, the Trustees assumed that service loss in the tributaries was consistent with losses in the shallow (0-2 meter depth) areas of Onondaga Lake.

[5] Thiessen polygons are generated from a set of points. Each Thiessen polygon defines an area of influence around its sample point, so that any location inside the polygon is closer to that point than any of the other sample points.

EXHIBIT 3-4 SPATIAL INTERPOLATION OF ONONDAGA LAKE SEDIMENT PECQS

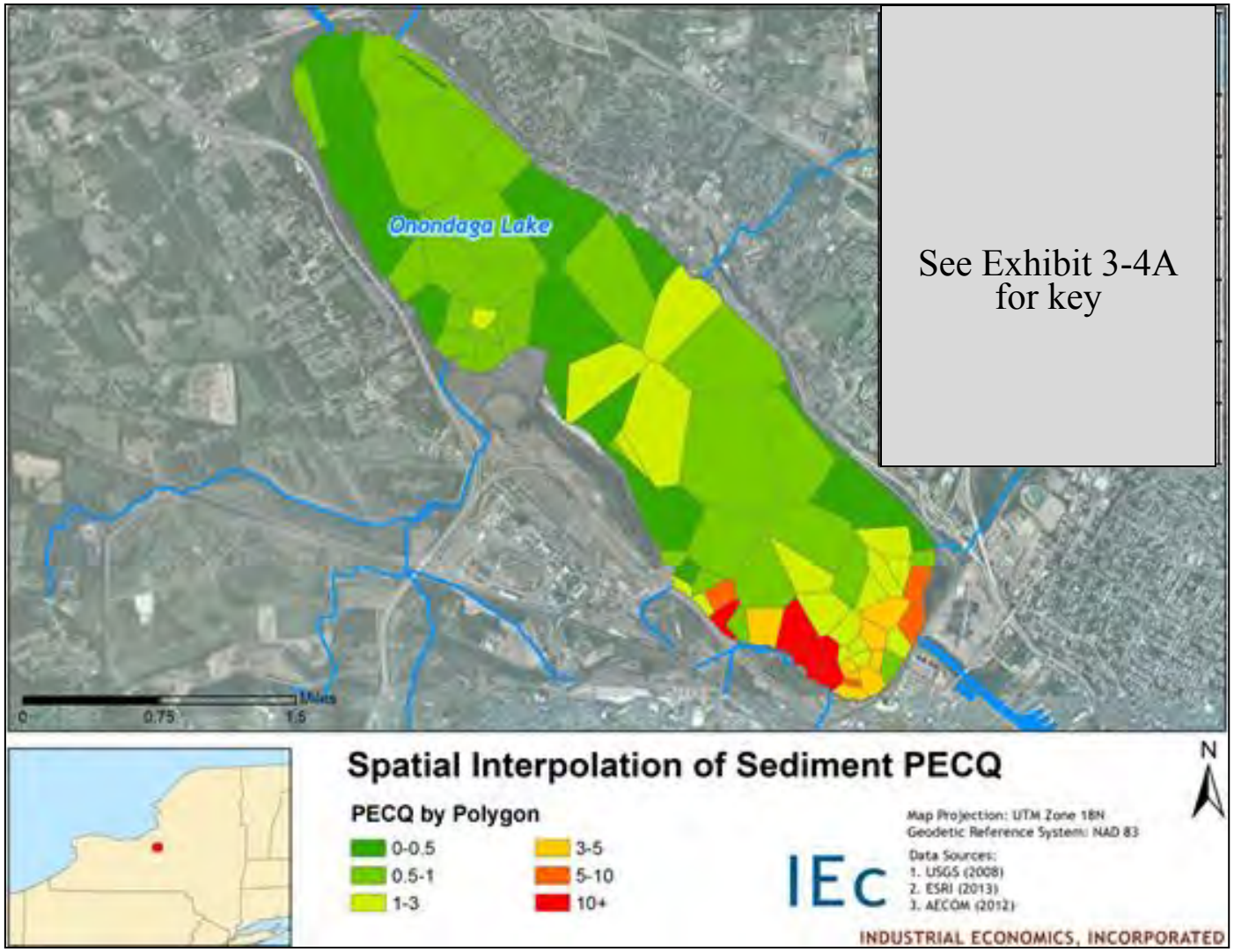


EXHIBIT 3-4A TRUSTEES' PROPOSED AVERAGE SEDIMENT SERVICE LOSS BY MEAN PECQ RANGE

Mean PECQ	Endpoint	Amphipod (% reduction)	Chironomid (% reduction)	Average Toxicity-Based Service Loss (% reduction)	Average Toxicity-Based Service Loss (% reduction) *Bounding Factor of 1.5
0- 0.5	Survival	0	0		
	Reproduction	0	0		
	Service Loss	0	0	0	0
0.5-1	Survival	3	10		
	Reproduction	0	0		
	Service Loss	3	10	7	10
1-3	Survival	0	40		
	Reproduction	0	35		
	Service Loss	0	61	31	46
3-5	Survival	52	55		
	Reproduction	9	45		
	Service Loss	56	75	66	99
5-10	Survival	66	87		
	Reproduction	0	68		
	Service Loss	66	96	81	100
>10	Survival	52	87		
	Reproduction	32	68		
	Service Loss	68	96	82	100
Service loss calculated as the conditional sum of mortality and failed reproduction in survivors					
Average toxicity-based service loss = average of 2000 amphipod and chironomid service loss					
Bounding factor of 1.5 applied to account for differential sensitivity of non-test organisms					

Separately, the Trustees compared COC concentration data from lake and tributary sediments to thresholds developed by MacDonald et al. (2000), finding widespread contamination at concentrations above the probable effects concentration – the concentration above which harmful impacts to sediment-dwelling invertebrates are expected to occur more often than not. For example, the probable effects concentration for mercury is 1.06 milligrams per kilogram (mg/kg), indicating that injury to sediment-dwelling invertebrates is likely at sediment concentrations greater than 1.06 mg/kg and possible at concentrations less than 1.06 mg/kg. Most sediment samples from the lake exceeded this threshold, indicating that injury to sediment-dwelling invertebrates within the assessment area has occurred.

Fish

The Trustees evaluated injury to assessment area fish by comparing site-specific fish tissue mercury and PCB concentrations to corresponding effects information in the peer-reviewed literature. Fish tissue contaminant concentration data from 1981 through 2012 were selected from the NYSDEC/AECOM (2012) database, which includes samples collected over time by NYSDEC and Honeywell. The Trustees defined four fish trophic levels, from herbivore to piscivore, and calculated a mean mercury body burden for each trophic level in the assessment area (0.25-1.33 mg/kg wb ww). To estimate the service loss associated with these concentrations, the Trustees used a published relationship between mercury concentrations in fish and percent lethality equivalents (Dillon et al. 2011), and a bounding parameter to account for factors such as sensitive species, a broad range of endpoints, and early life stage effects. Lethality equivalents include adverse effects on survival, reproductive success, and lethal developmental abnormalities in various fish species, which the Trustees assumed reflect a loss in ecological services. The Trustees then calculated the average service loss across all four guilds (accounting for baseline conditions[6]), to be approximately 23 percent.

Because less PCB data were available than mercury, the Trustees determined the average PCB concentration across all Onondaga Lake and tributary fish species between 1981 and 2012 was 1.9 mg/kg wb ww. At this level of contamination, the following adverse effects have been documented to occur in relevant fish species:

Bluegill sunfish

- Biochemical changes (as noted in bluegill and channel catfish (EPA 2000, Mayer et al. 1977));
- Behavioral changes (as noted in minnows (Bengtsson 1980));

[6] The DOI NRDA regulations define baseline as, "the condition or conditions that would have existed at the assessment area had the discharge of oil or release of the hazardous substance under investigation not occurred" (43 CFR 11.14(e)).

- Adverse effects on growth (as noted in minnows (Matta et al. 2001));
- Decreased survival (as noted in trout under conditions where survival is already being impacted by exposure to other contaminants (Bills et al. 1981)).

Therefore, the Trustees conclude that injury to assessment area fish has occurred as a result of exposure to mercury and PCBs.

Aquatic Birds

Injury to aquatic birds was evaluated by comparing measured and modeled dietary contaminant concentrations to adverse effects thresholds documented in the scientific literature. This is a standard approach, as data on prey contaminant concentrations are generally more prevalent than avian tissue contaminant concentration data. Additionally, because contaminants, such as mercury and PCBs, bioaccumulate, are persistent in the environment, and are poorly metabolized, dietary data provide a reasonable measure of long term exposure.

The dietary composition of the avian community is varied, so species are likely exposed to different levels of contamination, depending on their feeding strategy. To account for this, and because it is impractical to model each potentially exposed species' diet individually, the Trustees divided the avian community into four feeding guilds: high level piscivore, low level piscivore, insectivore, and omnivore (Exhibit 3-5). The Trustees assumed that high level piscivores, such as the osprey, consume fish larger than 12 centimeters (cm), while low level piscivores consume fish smaller than 12 cm. Insectivores, such as the tree swallow, consume a diet of insects such as chironomid flies, and omnivores, such as the mallard, consume a mixed diet of insects, plants, and mussels. The Trustees then calculated the average dietary mercury concentration for each of these groups (Exhibit 3-5).

Osprey - Onondaga Lake

EXHIBIT 3-5 SUMMARY OF DIETARY MERCURY CONCENTRATION BY FEEDING GUILD

GUILD	GUILD EXAMPLE	ASSUMED DIET	OVERALL MERCURY CONCENTRATION In DIET (MG/KG)
High Level Piscivore	Osprey	100% Fish > 12cm	0.80
Low Level Piscivore	Belted kingfisher	100% Fish <12cm	0.25
Insectivore	Tree swallow	100% Insects	0.28
Omnivore	Mallard	50% Plants, 25% Invertebrates, 25% Mollusks	0.06
Data Source: NYSDEC/AECOM (2012).			

A literature review indicated that the onset of adverse effects on birds at dietary concentrations above 0.15 mg/kg mercury on a whole body wet weight basis. Some examples of adverse effects include:

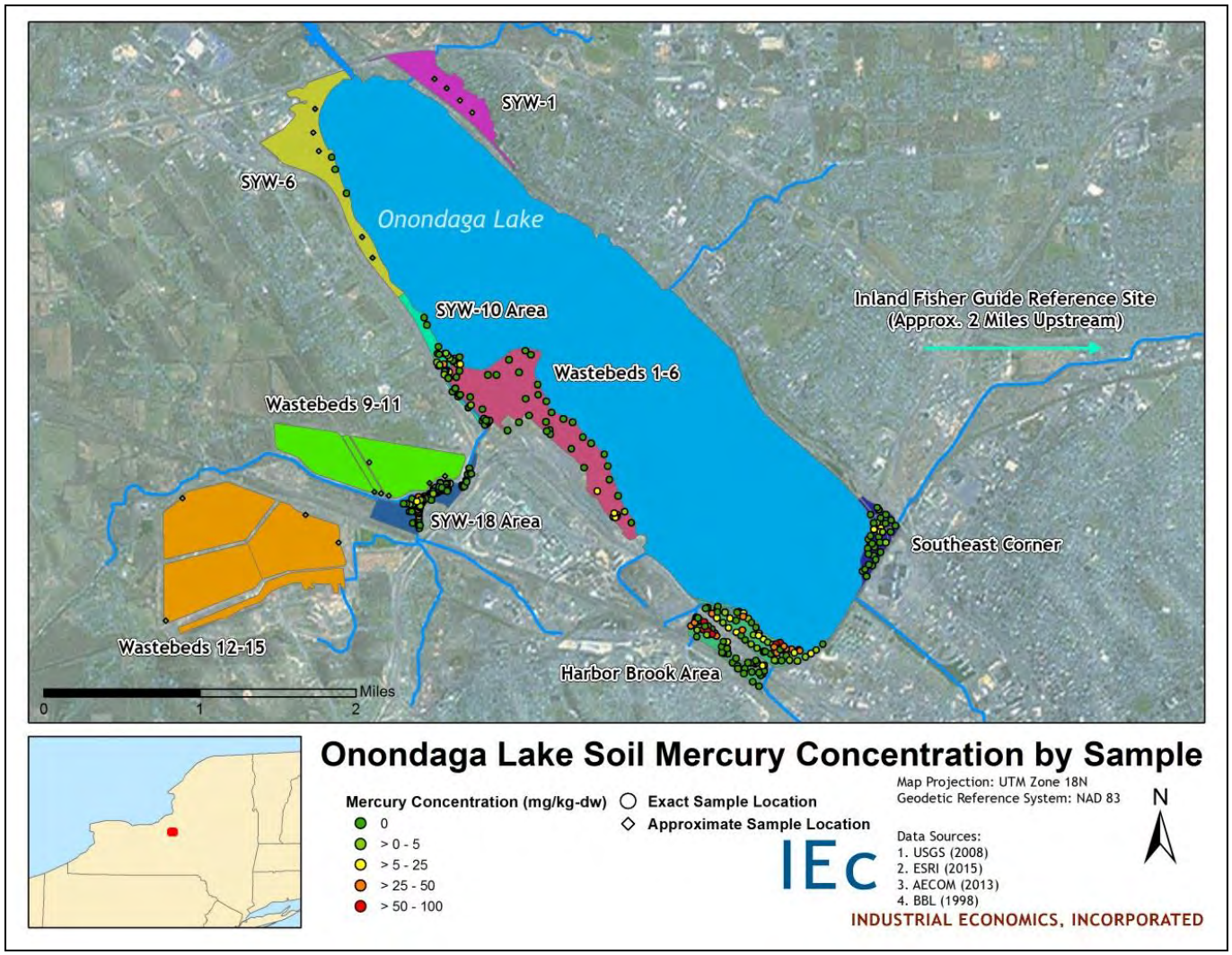
- A 40 percent reduction in fledging success in common loons at 0.16 mg/kg mercury in diet (Evers et al. 2008),
- A 29 percent reduction in fledging of the kestrel at 0.26 mg/kg mercury in diet (Albers et al. 2007), and
- A 35 percent reduction in the productivity of the black-crowned night heron at 0.43 mg/kg mercury in diet (Henny et al. 2002).

Comparing the dietary mercury concentrations presented in Exhibit 3-5 with the effects levels reported in the literature, the Trustees concluded that injury to high level piscivores, low level piscivores, and insectivores in the assessment area has occurred and averages about 17 percent, accounting for baseline conditions.

Soil-dwelling Invertebrates

Similar to the approach taken for other resources, the Trustees compiled available site-specific soil mercury data and conducted a review of the literature regarding the adverse effects of mercury on soil-dwelling invertebrates. Soil mercury concentrations in the assessment area range from non-detect to greater than 10 mg/kg (Exhibit 3-6). Studies on earthworms indicate that within this concentration range, adverse effects are expected. For example, 29 percent of earthworms did not regenerate segments at a soil mercury concentration of 5 mg/kg (Beyer et al. 1985). Lock and Janssen (2001) reported a 50 percent decrease in cocoon production in the springtail, *Folsomia candida*, at a soil mercury concentration of 3.26 mg/kg, and Beyer et al. (1985) showed increased mortality of springtails of five and 19 percent at soil mercury concentrations of 1 and 5 mg/kg, respectively.

EXHIBIT 3-6 SUMMARY OF ONONDAGA SOIL MERCURY CONCENTRATION BY SAMPLE



Therefore, the Trustees determined that injury to soil and soil invertebrates has occurred and that service losses due to mercury range from zero percent (e.g., Wastebeds 9-11) to 19 percent (e.g., Harbor Brook), with losses in most of the assessment area less than or equal to seven percent.

Terrestrial Birds

Because the dietary composition of the avian community is varied, species are likely exposed to different levels of contamination. To account for this, and because it is impractical to model each potentially exposed species' diet individually, the Trustees divided the relevant avian community into three feeding guilds: 1) invertivores that consume insects, spiders, earthworms, and other soil invertebrates, 2) omnivores that consume plant matter as well as animal prey, and 3) shorebirds that consume soil and sediment invertebrates and are most closely linked to the edge of aquatic habitats.

To assess injury to each of these guilds, the Trustees reviewed exposure data from two site-specific studies and effects data from the peer-reviewed literature. Cohen and Chaudhary (2014) and Lane et al. (2012) collected blood mercury data from a suite of avian species. The Trustees compiled these data by guild, season (e.g., invertivores are not expected to be present in the assessment area during the winter months), and sub-section of the assessment area. Resulting averages ranged from 0.22-3.61 mg/kg mercury in blood, with the highest concentrations in the vicinity of Harbor Brook and the Ninemile Creek corridor between Wastebeds 1-6 and SYW-18. These averages were applied to a published relationship between mercury concentration in blood and nest survival (Jackson et al. 2011). For example, Jackson et al. (2011) reported a ten percent reduction in reproductive success of the Carolina wren at blood mercury concentrations of 0.7 mg/kg, with incrementally more severe reductions at higher blood mercury concentrations. Because many of the average blood mercury concentrations of assessment area were greater than 0.7 mg/kg, the Trustees concluded that injury to terrestrial birds had occurred, with service losses due to mercury ranging from six percent (e.g., southeast corner of lake) to 29 percent (e.g., Harbor Brook; accounting for baseline). Losses in most of the assessment area were less than or equal to 16 percent.

Red-winged blackbirds

Reptiles and Amphibians

To evaluate injury to reptiles and amphibians, the Trustees utilized information from both site-specific studies and the peer-reviewed literature, summarized in "Mercury in Northern Green Frogs and Snapping Turtles from Onondaga Lake, New York" (USFWS 2015). TES (2013a, 2013b) collected eastern snapping turtle blood and toenail tissue, along with whole northern green frogs. The Trustees selected the snapping turtle as a representative reptile because it is abundant and long-lived, and the northern green frog as a representative amphibian because it is abundant around Onondaga Lake. All reptile and amphibian tissues collected within the assessment area had substantially greater mercury concentrations than those at reference sites, indicating elevated mercury exposure.

Only a limited number of studies on the adverse effects of mercury on reptiles and amphibians exist. The Trustees compared Onondaga Lake snapping turtle blood mercury concentrations (262-768 nanograms per gram (ng/g) ww to concentrations reported to cause adverse effects in other turtle species, finding that within this range there is the potential for thyroid hormone alteration in Western pond turtles (322 ng/g) (USFWS 2015). This indicates the potential for injury to sensitive reptiles, though the literature is not sufficiently robust to draw strong conclusions. There are no studies on the effects of mercury on the northern green frog, so the Trustees compared northern green frog tissue concentrations (78-276 ng/g wb dry weight) to effects levels for the southern leopard frog (95-236 ng/g; Unrine et al. 2004, Unrine and Jagoe 2004), concluding that some sensitive species of amphibians in Onondaga Lake may be injured by mercury.

Bats

To evaluate injury to bats, the Trustees utilized exposure data from a site-specific study and effects data from the peer-reviewed literature. Yates et al. (2012) collected bat fur at a suite of Onondaga Lake sites, including from big brown and little brown bats. Fur from these species was also collected at reference sites such as Oneida Lake. The study found elevated mercury concentrations in bat fur around Onondaga Lake. The peer reviewed literature does not currently include

Indiana bats

information on the adverse effects of mercury on bats, so the Trustees compared assessment area bat fur mercury concentrations to effects levels in fur of other mammals. For example, Yates et al. (2012) concluded that approximately 53 percent of the adult bats (42 percent of juvenile and adult bats combined) captured at Onondaga Lake in 2009 had fur mercury concentrations (range = 1.43 - 60.78 micrograms per gram (µg/g)) that exceeded a deer mouse fur Lowest Observed Adverse Effects Level (LOAEL) of 10.8 µg/g fresh weight (Burton et al. 1977). Approximately 28 percent of adult bats (17 percent of juvenile and adult bats) captured at the reference site had fur mercury concentrations in excess of a deer mouse fur LOAEL of 10.8 µg/g. A small number of bats from Onondaga Lake also had fur mercury concentrations that exceeded an adverse effects threshold for mink (40 – 50µg/g), as described in Basu et al. (2007). Therefore, the Trustees expect that injury to bats in the assessment area as a result of exposure to mercury is likely, but available information is not sufficient to quantify losses.

Habitat Losses and Geographic Scope of Ecological Injury

To understand the overall scale and scope of ecological losses incurred as a result of COC exposure, the Trustees used habitat equivalency analysis (HEA), a method commonly applied in NRDAR to determine how much restoration is required to compensate for the ecological losses (see 43 CFR § 11.8(c)(2). The basic premise of HEA is that the public can be compensated for past and expected future losses in ecological services through the provision of additional ecological services in the future. Compensable losses are "interim" losses, that is, the loss in ecological services incurred from the time the resource is injured[7] until the services provided by the injured resource return to their baseline level (which may be some years in the future). Because of its large spatial extent, the Trustees divided the assessment area into sub-sections based on environmental parameters (e.g., hydrology, topography, habitat type). Habitat loss in each of these subsections was estimated as the average percentage service loss incurred by natural resources representative of that habitat (e.g., sediment, fish, and piscivorous birds represent losses to aquatic habitat) in each year of the analysis. Approximately 95% of the calculated ecological injury was associated with resources of Onondaga Lake (versus the tributaries to the lake) since most injury was to aquatic resources and the lake is the largest aquatic resource contaminated with mercury and other COCs. To illustrate this fact, we present Exhibit 3-7, which is a summary of the aquatic assessment areas by acreage considered for ecological injury.

[7] Damages are calculated from the start of injury or 1981, whichever is later, in accordance with the promulgation of CERCLA and the divisibility of damages.

EXHIBIT 3-7 ASSESSMENT AREA FOR ESTIMATING INJURY TO FISH, SEDIMENT-DWELLING INVERTEBRATES AND AQUATIC BIRDS FROM MERCURY EXPOSURE

Waterbody	Acres	Description
Onondaga Lake	2972	Entire Lake
Onondaga Lake Outlet	23	To Seneca River
Onondaga Creek	26	To Dorwin Avenue
Ninemile Creek	28	To Amboy Dam
Ley Creek	42	To Warners Road
Geddes Brook	1.6	West Flume to 695
Harbor Brook	1.8	To State Fair Blvd
Bloody Brook	2.1	Bloody Brook Middle Branch
West Flume	0.7	Entire Stream
East Flume	3.4	Entire Stream
Iron Brook	0.4	Entire Stream
Tributary 5A	0.2	Entire Stream
Sawmill Creek	1.9	To Liverpool Golf Course
See Exhibit 1-1; Upstream creek designation in Description column is the first impassable barrier to fish upstream of contamination		

Although injury to additional Trust resources that rely on the aquatic habitat is likely (e.g., amphibians and reptiles), insufficient data exist to quantify these losses. However, because losses are calculated on a habitat basis, injuries to other species groups are qualitatively incorporated. In addition, it is expected that restoration projects implemented to compensate for damages to the aquatic and terrestrial systems will benefit all species groups associated with those habitats, even resources for which data were insufficient to quantify losses.

The HEA quantified the ecological losses as discounted service acre years (DSAYs). The Trustees used the HEA to quantify the present value of ecological losses from 1981 (when CERCLA was enacted) through 2025. The end date of 2025 was determined as the date when injury to fish and wildlife resources would be zero, based on remedial forecasts. The Trustees calculated the ecological losses as 102,000 DSAYs.

The Trustees used this information to assess the appropriateness and sufficiency of the expected benefits from restoration actions under the preferred alternative.

3.3.2 Recreational Fishing, Boating, And Other Water-Based Activity Losses

Onondaga Lake lies along the western/northwestern side of Syracuse, providing potential recreational opportunities to the more than 660,000 people who live in the Syracuse metropolitan area (US Census Bureau 2016). The majority of the lake's shoreline is owned by Onondaga County and is open to the public.

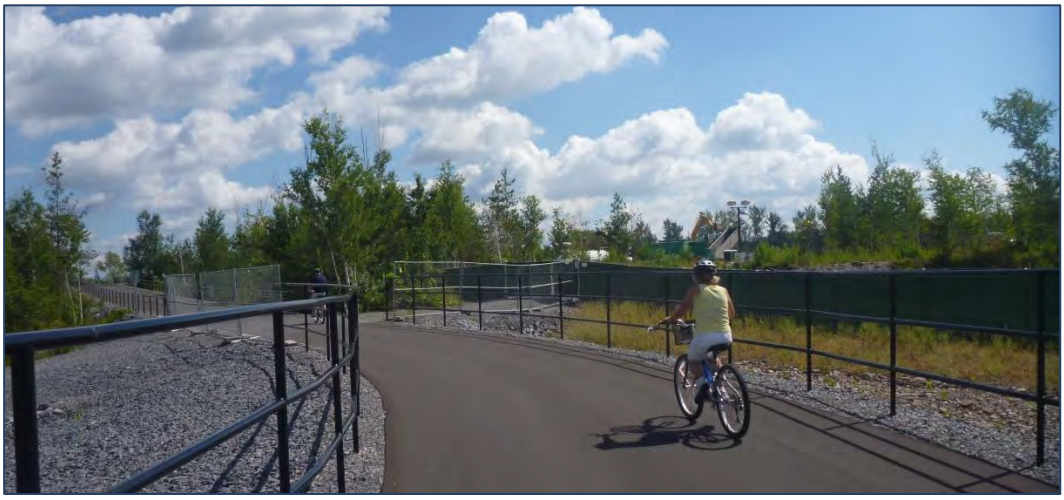
The lake offers abundant outdoor recreation opportunities, including fishing, boating, and shoreline recreation. Anglers can access the lake shoreline at Onondaga Lake Park, at a small fishing pier near the Salt Museum on the eastern side of the lake, and on jetties at the lake outlet. Species targeted by anglers include walleye, carp, bass, and perch/sunfish. A 2012 count study implemented cooperatively by the Trustees and Honeywell, with assistance from the State University of New York College of Environmental Science and Forestry, estimated that approximately 9,000 fishing trips were taken to the lake each year: 5,000 shore fishing trips and 4,000 boat fishing trips. Boating access is available via a county-owned marina and boat launch on the eastern shore, and via the Seneca River. The 2012 count study estimated that approximately 13,000 non-fishing boating trips were also taken to the lake that year. Finally, a popular, paved bike path (the East and West Shore Trails) runs along much of the lake shoreline, from the Bloody Brook outlet on the eastern shore to the NYS Fairgrounds Orange Parking Lot on the western shore, providing opportunities for outdoor recreation near the lake such as walking/running and biking.

Recreational fishing at Onondaga Lake has been impacted by releases of hazardous substances as a result of regulatory closures or bans on fishing and by the issuance of fish consumption advisories. Mercury was first detected at dangerous levels in the flesh of Onondaga Lake fish in 1970, and the State of New York banned fishing by regulation in the lake in the same year (a fishing ban is an injury under the DOI NRDA regulations at 43 CFR 11.62(f)(1)(iii)). This ban, issued by NYSDEC, remained in place until 1985, and fishing was limited to catch-and-release between 1986 and 1999. Since 1999, fish consumption advisories issued by the New York State Department of Health have been in place due to high levels of mercury, PCBs, and dioxin. Today, the lake's walleye, carp, channel catfish, white perch, and bass (over 15 inches) fisheries remain catch-and-release (i.e., eat none), while anglers are advised to consume no more than one meal per month of nearly all other fish species.[8] These advisories are substantially more restrictive than New York's statewide consumption advisory, which advises the general population to eat no more than four meals per month of any fish species taken from New York waters.

[8] The current advisory is more restrictive ("do not eat" for all species) for women under 50 and for children under 15.

Onondaga County Park and marina

Onondaga Lake jetty with access for fishing



Onondaga Lake pedestrian and biking path

The fishery closure and fish consumption advisories are likely to have caused a loss in the value the public holds for participating in a fishing trip to Onondaga Lake, that is, a loss in consumer surplus. An angler's consumer surplus from a fishing trip represents the difference between: 1) the maximum amount the angler is willing to pay for the trip, and 2) the amount that the angler actually paid for the trip (in gasoline, bait, etc.). Thus, consumer surplus is a measure of the net economic value of a fishing trip, after all expenses have been paid. An angler's loss due to the advisories/closure is equal to the difference between the consumer surplus the angler would receive from a trip without the advisories/closure and the consumer surplus the angler would receive from a trip with the advisories/closure in place.

There are a variety of ways in which anglers may incur consumer surplus losses from fish consumption advisories and closures:

- **Diminished Trips:** Anglers may continue to fish at Onondaga Lake despite the advisories (e.g., the 9,000 anglers estimated to fish at Onondaga Lake in 2012). These anglers may suffer losses if they modify their behavior in order to avoid the contamination (e.g., eat fewer fish, clean their fish in a different manner, or switch to catch-and-release fishing) or if their experience is diminished due to knowledge of contamination at the site.
- **Substituted Trips**: Anglers may choose to fish at an alternative site rather than at Onondaga Lake. These anglers suffer losses if Onondaga Lake is their preferred destination, but they fish at a less desirable substitute fishing site due to the advisories.
- **Lost Trips**: Anglers may choose to pursue an alternative activity as a result of the advisories. These anglers suffer losses if fishing at Onondaga Lake is their preferred activity, but they choose to pursue an alternative, non-fishing activity due to the advisories (e.g., hunting, swimming, or gardening).

In addition, the fishery closure and fish consumption advisories may have led to consumer surplus losses for non-fishing boaters and other lake visitors (e.g., walkers/bikers and birdwatchers). These visitors may have suffered losses if the fishery closure/advisories stigmatized Onondaga Lake for them, reducing the consumer surplus associated with their visits to the lake.

The Trustees used this information to evaluate overall recreational losses, that is, affected trips and the lost value associated with those trips over the time frame of the fishery closure and fish consumption advisories. Because the assessment was done cooperatively with Honeywell, a team of economists explored various methods to determine the number of trips for baseline and a number of trips lost. This process involved various exercises from both Honeywell and the Trustees. Methods that were employed at various stages of the recreational fishing assessment include extensive literature reviews, Benefits Transfer and Random Utility Modeling, all using the 2012 count study as a starting point. For example, using the 2012 count study and extrapolating through time, the Trustees estimated that over 1.2 million fishing trips have been and will be lost as a result of the

historic fishing bans and the past and expected future fish consumption advisories on Onondaga Lake. In addition, the Trustees assessed the sufficiency of the expected benefits from restoration actions under the preferred alternative to compensate for these losses, such as by developing estimates of the potential number of trips gained from a particular restoration project option. This enables the Trustees to scale losses and gains in the same unit to demonstrate that the public is being compensated for contaminant-related lost trips by the provision of new similar trip opportunities in the future.

CHAPTER 4 | PROPOSED RESTORATION ALTERNATIVES

The Trustees' primary goal is to select a restoration alternative that sufficiently compensates the public for natural resource injuries and associated service losses resulting from contamination in the Onondaga Lake assessment area. As summarized in Chapter 3, available information indicates that injuries have occurred to resources that utilize aquatic, wetland, and upland habitats and provide ecological and/or recreational services. According to the Department of the Interior NRDAR regulations, 43 CFR § 11.82(d), the selected alternative is to be feasible, safe, cost-effective, address injured resources, consider actual and anticipated conditions, have a reasonable likelihood of success, and be consistent with applicable laws and policies, as well as satisfying the other factors as enumerated and evaluated in Chapter 5 below.

The Trustees prioritized restoration projects that satisfy the DOI NRDAR guidance, including the following specific criteria:

- Project will provide benefits that are linked directly to potentially injured natural resources or related service losses. This includes a focus on projects within the Onondaga Lake watershed (i.e., geographic proximity to potentially injured resources; Exhibit 3-1), as well as projects that promote habitat connectivity and/or expanded public use.
- Project will provide natural resource benefits and services that would not otherwise be generated. That is, projects must not be otherwise required (e.g., under Federal, state, or local laws, regulations, or permits), funded, or assured of completion irrespective of NRDAR activities.
- Project is sufficiently developed such that implementation can occur in a timely manner.

Habitat near Onondaga Lake

As described in Sections 1.6.1 and 1.7, the Trustees compiled a list of potential restoration options. Dozens of project suggestions were generated by the Trustees themselves, as well as Honeywell, Onondaga County, existing documents and plans, and other members of the public. Using the site-specific restoration criteria described above, and consistent with the restoration planning guidance in the DOI NRDA regulations (42 CFR §11.82 (a)) and NEPA (42 U.S.C. §

4321, et seq., and the regulations guiding its implementation at 40 CFR Part 1500), the Trustees considered three restoration alternatives. These alternatives are described below and are evaluated in Chapter 5 to assess compliance with the DOI NRDAR factors (43 CFR § 11.82(d)) and to ensure that the preferred alternative does not significantly adversely impact the quality of the human environment.

4.1 ALTERNATIVE A: NO ACTION / NATURAL RECOVERY

Alternative A, the "No Action / Natural Recovery" alternative, considers the environmental consequences of conducting no further restoration actions during or after the mandated remediation is completed. Under the "No Action" alternative, remedial actions designed to protect human health and the environment from unacceptable risk are completed as directed by state and Federal authorities. These remedial requirements, however, are not expected to immediately return natural resources to baseline ecological conditions (i.e., conditions but for the release of COCs). Natural resources will likely take years after remedial actions are completed to attenuate to COC concentrations at which adverse effects on natural resources and resource services are not expected, given the continued presence of COCs within the system.

Similarly, the "No Action" alternative is not expected to compensate the public for interim ecological and human use service losses (i.e., contaminant-related losses that occurred from pre-remedy until COC concentrations return to baseline). Remedial actions at this Site, which focus solely on removal or containment of contamination, reduce future injury, but do not provide the additional natural resource services required to make the public whole.

Lastly, the "No Action" alternative would not utilize settlement monies for restoration or acquisition of the equivalent of lost resources and resource services, which is the purpose of NRDAR. Therefore, the "No Action" alternative serves as a point of comparison to determine the context, duration, and magnitude of any environmental consequences that might result from the implementation of other restoration actions. Environmental consequences are considered in Chapter 5.

4.2 ALTERNATIVE B: RESTORATION THAT SATISFIES SITE-SPECIFIC CRITERIA

Alternative B, "Restoration That Satisfies Site-Specific Criteria," is expected to generate natural resource services similar to the services that the injured habitat would have provided but for Site-related contamination. Actions under this Alternative would truly be creating *additional* natural resource services as compensation for losses, as these projects are not otherwise required or funded. This alternative would increase habitat quality and quantity, promote habitat connectivity, create new public use opportunities and improve existing use options, and benefit Trust natural resources within the injured ecosystem.

There are a variety of habitat and recreational restoration options within the Onondaga Lake watershed that are expected to provide relevant ecological and public use services. Trust resources potentially benefited by these habitat restoration projects include surface water, sediments, aquatic invertebrates, fish, birds, turtles, amphibians, and mammals.

Project types, described more fully below, would include habitat creation, habitat restoration, habitat preservation, and recreational improvements. Available settlement funds, restoration opportunities, and restoration costs will influence the final scale and scope of projects implemented in each category.

4.2.1 Habitat Creation, Restoration, And Enhancement

The Trustees are considering habitat creation, restoration, and enhancement projects under this Alternative. Habitat creation involves converting one type of habitat to another. Typically this is undertaken when:

Geddes Brook restoration area

1. A disturbed/non-habitat area is converted to habitat. For example, an abandoned parking lot could be cleared, graded, and planted as native grassland (e.g., to support migratory songbirds).
2. An area is restored to a historic habitat type. For example, a wetland, previously filled, could be excavated, re-graded, hydrologically reconnected to surface water or other wetland, and replanted with native wetland vegetation (e.g., to support waterfowl, amphibians, etc.).
3. There is a specific need for a particular habitat type in an area. For example, if an endangered plant requires vernal pools for survival, protection, and restoration for that species is a resource management priority. In the assessment area, vernal pools are sufficiently rare such that conversion of other habitat (e.g., upland) to vernal pool(s) would be appropriate.

Habitat restoration or enhancement includes improvement of degraded habitat, ideally returning the area to conditions that better approximate "natural" conditions. For example, if the hydrologic connectivity of an existing wetland is restricted by an undersized culvert, the existing culvert could be replaced with a larger, more wildlife-friendly culvert. Other examples of habitat restoration activities include invasive species removal, planting of native species, or the addition of soil amendments to promote natural vegetation growth.

The actions the Trustees propose for habitat creation, restoration, and enhancement would maximize use of low impact techniques. For example, invasive species management would likely focus on physical removal. That is, plants may be removed by digging, pulling, mowing, or cutting, which are often done by hand. However, some more impactful strategies may need to be implemented. Some herbaceous and woody plants may require mechanical removal with chainsaws, mowers, or other machinery (NOAA

2015), and some may require targeted chemical removal. Revegetation techniques would focus on preparing the seedbed by tilling or plowing; seeding or planting by hand or with mechanical equipment; and installing seeds, plants, or woody materials such as trees and shrubs. Grading would likely be done with heavy machinery to roughly prepare an area (e.g., earth moving, tilling, and compaction) and then using a grader to finish the surface.

4.2.2 Habitat Preservation

This involves preservation of habitat that would otherwise be developed or degraded. Habitats may be preserved through land acquisition, land donations, and/or transfers, or conservation easements. The Trustees would consider projects that may preserve wetland, riparian, and/or upland habitats essential to a variety of fish and wildlife species, including species that are the same as or similar to those injured by COC releases within the assessment area. Habitat preservation activities could also include the acquisition of ecologically valuable habitat or establishment of conservation easements on riparian habitat along ecologically valuable waterways. Where possible, the Trustees would preserve land that is adjacent to protected habitats to increase the benefits of preservation (e.g., maximize the acres of adjacent protected lands to increase connectivity of habitat). For example, a developer is planning to purchase land to construct a shopping center. The land is adjacent to a stream that supports threatened frog species, and is visible from nearby hiking trails. Purchase and preservation of the property would prevent the degradation of the area within the shopping center footprint, the stream, and the viewshed.

Ninemile Creek near Hudson Farms

Final selection of specific lands that would be preserved would consider factors such as the ecological value of the wetland and riparian habitats, Trustee resource management priorities, inherent improvement of water quality, ownership/protection opportunities, geographic/ecological diversity, local/regional planning, citizens' concerns, and the ability to find willing sellers. Land acquired would be deeded to individual state, tribal, Federal, or local governments; land trusts; or conservation non-governmental organizations in accordance with relevant procedures and standards set for each entity. The primary purpose of these preservation efforts is to protect fish and wildlife habitats. Other uses, such as recreational activities, may be permitted, but only in a manner that supports the goal of ecological preservation.

4.2.3 Recreational Enhancement Projects

New/improved recreational opportunities within the Onondaga Lake watershed are expected to provide natural resource services similar to the services lost due to contaminant-related closures and advisories. This includes new or improved opportunities for fishing and/or boating within the watershed, as well as other habitat-related recreational activities (e.g., swimming, walking, hiking, and bird-watching). For example, the Trustees could acquire access to property and develop a fishing/boating pier and ramp in a section of the lake previously unavailable to the public. The Trustees would also consider improving existing access areas, such as through additional parking, improved amenities, and increased public fishing rights. These types of opportunities would enable the Trustees to conduct restoration both in areas where recreation may have been affected by Site-related contamination, and in areas where the public may have fished instead of at the lake.

Onondaga Lake angler

4.2.4 Specific Proposed Projects

At this time, the Trustees have identified a suite of restoration projects under this Alternative that encompass all of the project types described above. Ecological projects are summarized in Exhibit 4-1; recreational projects are summarized in Exhibit 4-2. Note that some projects are expected to provide both ecological and recreational services and are listed in both Exhibits. The final project details, including critical milestones and deadlines, will be set forth in work plans submitted to and approved by the Trustees for each restoration project closer in time to actual project implementation. Conceptual designs are presented in Appendix B.

4.2.5 Future Project Fund

The Trustees received NRDAR settlement funds as part of the General Motors bankruptcy in 2012. These funds, with accrued interest, currently total $2,296,210 and are maintained in an Onondaga Lake Future Project Fund. The Trustees anticipate that additional settlement monies will be added to this Future Project Fund. Based on public comments during the review of the Draft RP/EA, there is interest in additional project categories, as listed in Appendix D.

The Trustees recognize that certain areas of the Onondaga Lake watershed, including Lower Onondaga Creek and the City of Syracuse, are not represented in Alternative B. Several commenters on the Draft RP/EA submitted specific proposals for restoration projects in these areas. For example, projects have been proposed for Kirk Park, Arsenal Park, and Rich Street in the City of Syracuse. These projects, while still in the initial design stage, will be fully considered by the Trustees for funding by the Future Project Fund.

That funding process will occur during the next phase of restoration planning, which will analyze specific restoration proposals and ultimately implement additional restoration projects beyond those described in Alternative B. During that phase, the Trustees will perform stakeholder outreach and public participation in order to solicit additional restoration projects and develop proposed projects that satisfy all of the relevant criteria discussed in the preamble to Chapter 4 of this RP/EA.

EXHIBIT 4-1 PROPOSED ECOLOGICAL RESTORATION PROJECTS UNDER ALTERNATIVE B

PROJECT NAME	POTENTIAL PROJECT LOCATION	POTENTIAL ACTIONS	Project Proponents (see Exhibit 4-3)
In-Lake Habitat Creation	Lake bottom, both remedial and other areas - approximately 278 acres	Installation of structures to provide habitat for fish, amphibians, and invertebrates	1,2,7,8,15,18
Terrestrial Habitat Ecological Enhancement	Hudson Farms, northwest and west of Settling Basins 12-15 in Camillus - approximately 117 acres currently owned by Honeywell	Wetland enhancement, forest enhancement, vernal pool creation, habitat conservation	1,2,14,17
Aquatic Habitat Ecological Enhancement	Maple Bay area, northwest shoreline of Onondaga Lake - approximately 38 acres	Shoreline and shallow-water habitat enhancement	1,3,4,18
Ninemile Creek Corridor Ecological Enhancement	Ninemile Creek between Airport Rd and the NYS Fairgrounds - approximately 100 acres currently owned by Honeywell	Wetland enhancement, floodplain forest enhancement, habitat conservation	1,17
Invasive Species Control & Habitat Preservation	Onondaga Lake watershed	15 years of funding for identification and removal of invasive species within approximately 1,700 acres of wetlands, lake/river littoral zone, and riparian habitat	1,7,17
Wetland and Upland Conservation in Vicinity of Onondaga Lake	Vicinity of Onondaga Lake - approximately 200 acres	Wetland and upland habitat conservation	1,3,4,17,18
Native Grasslands Restoration	Settling Basin 13, Camillus - approximately 100 acres	Native grassland and inland salt marsh planting and maintenance to support breeding grassland birds	1,18
Habitat Preservation in southern Onondaga County	Onondaga County Onondaga Creek Watershed - approximately 1,023 acres in the Tully Valley currently owned by Honeywell	Habitat conservation, streambank enhancement	1,7,17

EXHIBIT 4-2 PROPOSED RECREATIONAL RESTORATION PROJECTS UNDER ALTERNATIVE B

PROJECT NAME	SERVICE TYPE	POTENTIAL PROJECT LOCATION	POTENTIAL ACTIONS	Project Proponents (See Exhibit 4-3)
Ninemile Creek Fishing Access	Fishing	Ninemile Creek between the southern boundary of Camillus, NY and Onondaga Lake	Public Fishing Rights, acquisition and enhancement of existing parking areas, construction of new parking areas, re-open canoe launch	8,18
Deepwater Fishing Pier	Fishing	Onondaga Lake	Installation of floating fishing pier along southwest shoreline	18
Erie Canal Trail Extension	Bicycling, Walking	Between the existing trailhead of the Erie Canalway Trail and the Onondaga County West Lake Recreation Trail parking area.	Trail extension, parking area construction	2,12,13
Outlet Jetty Enhancement	Fishing	Northern end of Onondaga Lake	Improvement of existing jetties in northern end of Onondaga Lake to facilitate better pedestrian and angler access	8,18
Seneca River Boating Access	Boating	Seneca River	Installation of a boat ramp and floating boat dock, parking area construction	2,8,18
Onondaga Lake Recreation Trail	Bicycling, Walking	Onondaga Lake	Starting on Honeywell property, south of the Visitor Center, extend existing trail on southwest shoreline to Harbor Brook	2,3,4,5
Onondaga Lake Angler Access	Fishing	Onondaga Lake	Public fishing access from Visitor Center to end of the east barrier wall along the southwest shoreline, parking area construction	3,5,6,8,18
Public Education Regarding Onondaga Lake Watershed	Education, Boating	Onondaga Lake	Improvements to Visitor Center on west shoreline, boat launch (rinse station), transfer to public entity	3,4,5,6,8,18
Onondaga County Recreational Opportunities	Fishing, Hunting, Hiking	Onondaga County (See Tully Valley project – Exhibit 4-1)	Public Fishing Rights, hunting access, construction of new parking lots	7,11

EXHIBIT 4-3 RESTORATION PROJECT PROPONENTS UNDER ALTERNATIVE B

PROJECT PROPONENT	Details	IDENTIFIER
The Onondaga Nation's Vision for a Clean Onondaga Lake	2010 report	1
Onondaga Lake Watershed Progress Assessment and Action Strategies	2010 report	2
Onondaga Lake Development Plan	1991 report	3
Onondaga Lake Environmental Action Plan		4
FOCUS Greater Syracuse Water & Waterways: Strategies Report	2004 report	5
Onondaga Lake Rehabilitation Guidance: the 2020 Vision Project	2007 report	6
Onondaga Creek Conceptual Revitalization Plan	2009 report	7
NYSDEC	Submitted project ideas 2015	8
Onondaga Environmental Institute	Submitted project ideas 2015	9
Onondaga Lake Partnership	Undated	10
Syracuse Land Use & Development Plan	2012	11
Bikeway System Plan Onondaga County	1976	12
Beebe	Submitted project idea 2015	13
ESF – Hudson Farms Survey Team	Submitted project idea 2014	14
Ringler, Kirby, Bassmasters	Submitted project ideas 2014 & 2015	15
Izaak Walton	Submitted project ideas 2014	16
CNY Land Trust	Submitted project ideas 2014	17
Onondaga County	Submitted project ideas 2015	18

4.3 ALTERNATIVE C: RESTORATION THAT DOES NOT SATISFY SITE-SPECIFIC CRITERIA

Alternative C, "Restoration that does not satisfy site-specific criteria or does not satisfy the criteria to the same extent as the projects in Alternative B," encompasses restoration projects that were proposed to the Trustees that are: 1) not as likely to provide natural resource services similar to injured/lost services, or to provide services in a cost-effective way; 2) already required or funded in non-NRDAR contexts; and/or 3) do not have clearly defined project-specific objectives and designs. These projects are summarized in Exhibit 4-4 and restoration project suggestion forms are included as Appendix C. With additional details, some of these projects may be considered for funding from the Future Project Fund.

EXHIBIT 4-4 PROPOSED RESTORATION PROJECT SUGGESTIONS UNDER ALTERNATIVE C

PROJECT	RATIONALE FOR LOWER SUITABILITY *
Historical Ecology Website	This project has a lower connection to injuries than more preferred projects; unclear how it would restore natural resources or natural resource uses that were impaired by hazardous substances.
Murphy's Island Transfer to Nation	Unclear whether Onondaga Nation Is interested in the property; remedial costs are likely to be high, reducing cost effectiveness; unclear how it would restore natural resources or natural resource uses that were impaired by hazardous substances.
Mudboil Mitigation	There is uncertainty about solutions due to data gaps. An Advisory Panel Report (SUNY ESF 2016) recommended a series of pilot projects that in total would greatly exceed any Trustee funds. Mudboil mitigation projects may be considered in the future if additional partnership funds can be allocated to the effort and as appropriate.
Additional Solvay Waste Containment	Remedial costs would be high – reducing cost-effectiveness.
Onondaga Lake Museum and Center	The Skä noñh Great Law of Peace Center and Salt Museum already exist at Onondaga Lake and the Visitor Center on the west shore of Onondaga Lake (Exhibit 4-2) may also be used as a museum and educational center.
Onondaga Creek Restoration	The estimated cost was not supported by information on the type and scope of projects to be implemented. Project idea references a "study", suggesting that areas in need of restoration are yet to be determined. Some upper Onondaga Creek restoration is proposed by the Trustees. Additional Onondaga Creek restoration projects may be considered in the future, as appropriate.
Pumpkin Hollow Biopreserve	This project has a lower connection to injuries than more preferred projects, but may be considered for future funding, as appropriate.

PROJECT	RATIONALE FOR LOWER SUITABILITY *
West Branch Public Access Park	This project has a lower connection to injuries than more preferred projects, but may be considered for future funding, as appropriate.
Stewardship/Grant Program	Proposed endowment for environmental stewardship has less of a direct connection to injuries from hazardous substances (to natural resources or natural resource users) than other proposed projects.
Riparian Habitat Acquisition Support	This project has a lower connection to injuries than more preferred projects, but may be considered for future funding, as appropriate.
Collection of Floatables/Debris in Aquatic Habitat and Oxygenation of Onondaga Lake	Proposed project was conceptual and components of it are already funded.
Streambank Stabilization at Rattlesnake Gulf and Rainbow Creek	Project idea was a bullet with no details provided; however, the Trustees may evaluate stream restoration within Onondaga County in the future.
Funding for Incentive Grants to Municipalities for Green Infrastructure Efforts	Project idea was a bullet submitted with no details about scope or funding needs. Green infrastructure projects may be considered in the future, as appropriate.
Floating Classroom	Acquisition of boats, development of plans and supporting educational and research operations do not directly provide restoration of injured resources or lost recreational use; high cost for minimal direct benefits to restoration.
Restore Upper Ley Creek	The estimated cost was not supported by information on why restoration is needed (i.e., what types of habitat degradation exist, approximate linear feet of projects). Ley Creek restoration projects may be considered in the future, as appropriate.
Restore Beartrap Creek	Field visit to Beartrap Creek with project proponent did not identify specific high priority restoration needs. Beartrap Creek restoration projects may be considered in the future, as appropriate.
Dorwin Fish Ladder	NYSDEC is not certain that fish passage is impaired here and upstream habitat is poor. This project, if expanded to include upstream habitat restoration, may be considered in the future, if appropriate.
Furnace Brook Daylighting Feasibility Analysis	The proposed feasibility study is not directly tied to restoration of injured resources, costs for study are high, and day-lighting would likely not be cost-effective for benefits achieved, likely causing significant disruption to homeowners.
Harbor Brook Daylighting Feasibility Analysis	The proposed feasibility study is not directly tied to restoration of injured resources, costs for study are high, and day-lighting would likely not be cost-effective for benefits achieved, likely causing significant disruption to homeowners.
Fish Passage Restoration Prioritization	Most fish passage barriers are already known.

PROJECT	RATIONALE FOR LOWER SUITABILITY *
Water Research and Education Center	Although projects with a research and education component may be considered "restoration", this proposed facility is very expensive and a less cost effective educational facility than the existing visitor center. Research, education, and monitoring do not directly provide restoration of injured resources or lost recreational use and must be carefully evaluated for cost effectiveness and resource or resource user benefits; high cost for minimal direct benefits to restoration.
Bald Eagle Viewing or Nesting	Logistical issues with providing winter eagle viewing at southern end of Onondaga Lake; restoration project has a less direct connection to injuries from hazardous substances (to natural resources or natural resource users) than other recreational projects. No location has yet been identified for an eagle nesting platform. Both projects may be considered for future funding, if appropriate.
* See Appendix C for copies of proposals	

CHAPTER 5 | EVALUATION AND SELECTION OF THE PREFERRED ALTERNATIVE

The Trustees' primary goal in this chapter is to identify a preferred restoration alternative that compensates the public for natural resource injuries and associated losses resulting from COC releases within the assessment area. Given the discussion of restoration alternatives in Chapter 4, this chapter assesses the environmental consequences of Alternative A: No Action/Natural Recovery and Alternative B: Restoration that Satisfies Site-Specific Criteria to determine whether implementation of either of these alternatives may significantly affect the quality of the human environment, particularly with respect to the physical, biological, socio-economic, or cultural environments of Onondaga Lake and its associated watershed. Alternative C: Restoration that Does Not Satisfy Site-Specific Criteria, or does not satisfy the criteria to the same extent as projects under Alternative B, is not evaluated because the actions proposed under that Alternative will not address natural resources injuries in the best implementable, cost-effective way, as described in 43 CFR § 11.82. This chapter also evaluates readily available information on environmental consequences and serves as a draft environmental assessment (EA) for the Onondaga Lake NRDAR.

5.1 ASSESSMENT OF ENVIRONMENTAL CONSEQUENCES

In order to ensure the appropriateness and acceptability of the proposed restoration alternatives, the Trustees evaluated each alternative against a suite of restoration criteria. Ten factors are listed within the NRDA regulations as considerations when evaluating a preferred alternative (43 CFR § 11.82(d)):

- Technical feasibility,
- The relationship of the expected costs of the proposed actions to the expected benefits from the restoration, rehabilitation, replacement, and/or acquisition of equivalent resources,
- Cost effectiveness,
- The results of actual or planned response actions,
- Potential for additional injury resulting from the proposed actions, including long-term and indirect impacts, to the injured resources or other services,
- The natural recovery period,
- Ability of the resources to recover with or without alternative actions,
- Potential effects of the action on human health and safety,
- Consistency with relevant Federal, state, and tribal policies, and,
- Compliance with applicable Federal, state, and tribal laws.

Additionally, actions undertaken to restore natural systems are expected to have beneficial and/or adverse impacts to the physical, biological, socio-economic, and cultural environments. In order to determine whether an action has the potential to result in significant impacts, the context and intensity of the action must be considered, as provided in 40 CFR 1508.27. Context refers to area of impacts (local, state-wide, etc.) and their duration (e.g., whether they are short- or long-term impacts). Intensity refers to the severity of impact and could include factors such as the timing of the action (e.g., more intense impacts would occur during critical periods like wildlife breeding/rearing, etc.), the effect on public health and safety, and cumulative impacts. Intensity is also described in terms of whether the impact would be beneficial or adverse.

In the analysis below, the Trustees examine the likely beneficial and/or adverse impacts of Alternatives A and B on the quality of the human environment. If the Trustees conclude that the actions associated with the preferred alternative will not lead to significant adverse impacts, then the Trustees will issue a finding of no significant impact (FONSI). If significant impacts are anticipated, the Trustees will proceed with an EIS to evaluate a reasonable range of restoration alternatives and the environmental consequences of those alternatives. The Trustees will continue to evaluate environmental impacts as specific projects are implemented. The following sections assess anticipated environmental consequences of the restoration alternatives in light of the ten NRDAR factors listed above.

5.2 EVALUATION OF ALTERNATIVE A: NO ACTION / NATURAL RECOVERY

The No Action / Natural Recovery Alternative would not initiate any restoration action outside of currently funded programs. Instead, the ecosystem would attenuate to background conditions based on natural processes only, with no assistance from active environmental restoration. Although the lack of action makes this Alternative technically feasible and cost effective, this Alternative:

- Does not restore injured resources to baseline. Remediation is expected to include years of monitoring after sediment removal actions are completed, but lack of restoration beyond remedial actions will reduce the potential for resources to fully recover to baseline conditions.
- Does not compensate the public for interim losses. Habitat quality would not be improved above baseline, wildlife would continue to be injured due to mercury and other COCs, and fishing and boating opportunities would not improve or increase.
- Is not consistent with Federal and state policies and laws. Under this Alternative, the available settlement monies that are meant to be directed toward NRDA restoration actions would not be spent.

While the No Action Alternative does not *create* additional adverse impacts to the environment, it also does not provide the ecological, recreational, and socio-economic benefits described under Alternative B. Given the long time frame until natural

attenuation of COCs is achieved once sediment removal actions conclude, under the No Action Alternative adverse environmental consequences from mercury and other contaminants (i.e., ecological and human use injuries) are expected to continue into the future and would not be mitigated through restoration actions. That is, the No Action Alternative may result in adverse impacts to fish and other wildlife, as well as reductions in the ecological and human use services provided by lacustrine, riverine, wetland, and upland habitats due to the lack of additional habitat functionality resulting from the absence of NRDAR-related restoration and/or preservation actions in the assessment area. Therefore, the No Action Alternative is not a favorable restoration alternative when evaluated against the NRDAR factors. This Alternative serves as a point of comparison to determine the context, duration, and magnitude of environmental consequences resulting from the implementation of Alternative B.

5.3 EVALUATION OF ALTERNATIVE B: RESTORATION THAT BEST SATISFIES SITE-SPECIFIC CRITERIA

Alternative B, "Restoration that Best Satisfies Site-Specific Criteria," is expected to provide relevant natural resource services through timely implementation of projects within the Onondaga Lake watershed, with a strong emphasis in and around Onondaga Lake. Under this alternative, project types include habitat creation, restoration, and enhancement; habitat preservation through land acquisition and conservation easements; and recreational enhancement projects.

To provide a direct comparison to Alternative A, the Trustees evaluated Alternative B for consistency with the DOI NRDA restoration factors, provision of natural resource services at or above baseline, compliance with relevant regulations, and net environmental consequences.

First, Alternative B is consistent with the restoration factors outlined in the NRDA regulations at 43 CFR § 11.82(d). For example, habitat and wildlife restoration and public use projects within the Onondaga Lake watershed are technically feasible, cost effective, and would be specifically targeted to benefit multiple, relevant natural resources that utilize aquatic and associated upland habitat. There are many restoration options within and along Onondaga Lake itself, as well as in the tributaries and adjacent habitat. The Trustees plan to apply methods that have been successful in other locations to increase the probability of project success, building on remedial-related actions completed to-date.

Second, projects under Alternative B have the potential to compensate the public for natural resource injuries by providing additional, similar services in the future. Projects may either allow resources to more rapidly achieve baseline, or may improve resource conditions such that the habitat or resource provides services above and beyond baseline. For example, habitat creation and restoration activities provide natural resource services similar to the assessment area's baseline services. Restored wetlands and riparian areas provide habitat for spawning fish and migratory birds, improve water quality by filtering sediments and pollutants from the water column, reduce erosion, and export detritus.

These actions influence increased production of forage fish populations, which provide prey for piscivorous fish, birds, reptiles, and mammals. Preservation actions such as land acquisition and conservation easements protect ecologically important habitat from current and future land development. Restoration of wetland, upland, and riparian habitats has the potential to increase habitat connectivity throughout the restoration area, which is important in providing ecological services similar to those lost.

Wetland area near Onondaga Lake

Finally, the cumulative environmental consequences of Alternative B are expected to be beneficial to natural resources. Below, the Trustees assess the potential environmental consequences of each of the proposed project types. Adverse impacts to environmental justice and/or socio-economic factors are expected to be minimal at most, and may be mitigated during project selection. Any unavoidable adverse impacts would be minimized through individual project plans, and are expected to be far outweighed by the beneficial impacts of projects under this Alternative. Additional project-specific NEPA analysis would be completed if a proposed project has expected adverse effects beyond the scope of those analyzed here.

5.3.1 Habitat Creation, Restoration, And Enhancement

Habitat creation, restoration, and enhancement modify existing areas to improve the quality of ecological services provided.

Habitat creation in this case would involve converting low quality habitat to vernal pools, a unique habitat type that has been degraded due to a number of threats such as development, forest fragmentation, and climate change. Vernal pools are wetlands with a seasonal cycle of flooding and drying. For example, some vernal pools flood in the spring with water from melting snow, rain, or high groundwater and then typically dry by summer's end.

Creation of vernal pools would result in direct and indirect, short-term, localized, major impacts on natural resources such as soil, sediment, and vegetation. Existing habitat would be substantially modified to create the hydrology, grade, soil type, and vegetation necessary for the successful development of vernal pools. This would likely involve the use of heavy machinery and construction equipment, which may include soil compaction, emissions from heavy equipment, removal or crushing of understory vegetation, and increased soil erosion in the immediate area of construction operations. However, the long-term direct and indirect benefits expected from this type of restoration activity outweigh the potential adverse impacts. Amphibian and reptile diversity and population densities around Onondaga Lake remain lower than in surrounding areas (Ducey 2014). The creation of vernal pools within the Onondaga Lake watershed would provide significant benefit to these and other species. For example, vernal pools provide key breeding habitat for amphibians whose tadpoles and

Wetland area near Onondaga Lake

larvae are especially vulnerable to fish predation (fish cannot survive in vernal pools). These pools also provide prey for species such as turtles, birds, small mammals, and predatory insects.

Habitat restoration would include restoration of a variety of habitat types, such as in-lake habitat, wetlands, and grassland. In-lake habitat projects would involve installation of habitat structures on the lake bottom, consistent with actions taken under the remedy. The installation may cause minor, short-term, indirect impacts (e.g., emissions, noise) as a result of the machinery necessary to transport the structures over water and deploy them. However, the long-term direct and indirect benefits of these structures outweigh the potential adverse impacts. For example, habitat structures provide cover to increase survival of juvenile fish, spawning habitat to improve reproductive success, and complex substrate for colonization by benthic organisms (Bolding et al. 2004). These benefits to the invertebrate and fish communities result in indirect benefits to their predators within the aquatic and shore-based food webs. These structures are specifically designed to remain in place for decades, thereby providing ecological benefits throughout that extensive time period.

Wetland restoration creates the desired elevation and hydrology for wetland vegetation and fish habitat. Action may include planting, revegetation, site re-grading, bank restoration, use of herbicides to remove invasive species, and erosion reduction. These actions are expected to cause minor, short-term, localized impacts to existing resources and resource services, and result in moderate long-term benefits across a broad geographic scope. For example, wetland and riparian planting may cause short-term, localized impacts to existing vegetation at the restoration site (e.g., as existing vegetation is trampled or removed). During planting, which may last for multiple seasons, the resource services provided by that area are likely to be reduced through physical disturbance. Herbicides will be restricted to those allowed for use in aquatic environments and they will be applied by certified applicators. However, long-term, moderate beneficial impacts to water resources and associated flora and fauna would occur due to the reduced erosion and increased shelter provided by wetland plants. "Wetland planting activities would [also] result in beneficial impacts by restoring or creating wetland and/or shallow-water habitats that provide areas for feeding and shelter for fish, as well as nutrient cycling and carbon sequestration and storage capacity…Minor beneficial impacts related to socioeconomic resources may result from increased tourism opportunities that could develop around an improved resource." (NOAA 2015 p.156).

Regrading a portion of a restoration area may include the following actions: moving soil or sediment and placing the material either within the restoration area or at a disposal site, contouring the area to satisfy hydrologic and/or vegetative goals, and amending the area with topsoil or other capping material. Depending on the scope and scale of regrading, sediment or soil may be moved by non-motorized methods (e.g., shovels) or by earth-moving diggers and other equipment. These actions are expected to result in moderate, short-term, localized impacts to the re-graded area and any area that receives sediment or

soil as a result of the physical movement of material and corresponding disturbance of existing habitat, and minor, short-term localized impacts resulting from the noise and exhaust from construction vehicles. However, these impacts are outweighed by the major, long-term, localized, and broader benefits expected as a result of regrading. For example, likely benefits include, but are not limited to, improved hydrological conditions that would support high quality habitat and re-establish connections between habitats (e.g., wetland and riparian areas) and topography that would support native vegetative communities and corresponding biota.

Grassland restoration typically involves removal of existing vegetation through physical, chemical, or mechanical means, replanting native grassland species, and conducting frequent maintenance (i.e., mowing) to ensure the grassland does not convert to a more shrub-dominated or forested habitat type. The adverse impacts of these actions are expected to range from direct, short-term, localized, minor impacts to indirect, long-term, localized, minor impacts. For example, the short-term impacts associated with revegetation are similar to those described for wetland replanting above. The long-term minor impacts are associated with the continued maintenance of the habitat (e.g., emissions, noise from mowing). However, the long-term direct and indirect benefits of grassland restoration outweigh the potential adverse impacts. Grasslands are increasingly threatened by agriculture and development, yet are a crucial habitat for birds and other wildlife. For example, migratory songbirds such as bobolinks and savannah sparrows rely on grassland habitat for foraging and nesting during the summer, and small mammals such as voles and mice make their homes in grassland areas, and are an important food source to many birds of prey.

Restored grassland in New York

Cultural and historic resources and land use could experience indirect, long-term, minor adverse impacts resulting from habitat restoration. The land use in the floodplain, including any potential culturally sensitive areas, would change as the water resources in the floodplain changed (e.g., as a result of wetland restoration). Because land use would stabilize in the floodplain over time, the impact is expected to be minor (NOAA 2015).

5.3.2 Habitat Preservation

Conservation actions (e.g., land acquisition and conservation easements) are expected to cause indirect, long-term, moderate to major beneficial impacts to natural resources that utilize the conserved area, providing ecological and human use services. “These impacts would result from new management of land and water resources and would prevent

development of other degrading activities from taking place on the project site." (NOAA 2015 p.156). Beneficial impacts to natural resources "may occur from such restoration activities due to improved access to coastal areas and habitats, the creation of buffer zones between sensitive resources, altered or managed timing of water withdrawals, and other factors that could impact such resources. Depending on the nature of the land acquisition or protection action, land use overall could directly and moderately benefit over the long term, as fewer adverse environmental impacts occur at the project site. Recreational opportunities and land use practices would largely be improved as natural areas and ecosystems are preserved (e.g., through fee simple purchase of tracts of land or of water flows in rivers). Cultural and historic resources, if located on a protected parcel, would benefit from not being disturbed by development or other degrading activities that might otherwise occur." (NOAA 2015 p.157)

5.3.3 Recreational Enhancement Projects

Improvements to existing recreational access areas and creation of new access areas within the Onondaga Lake watershed would provide compensation for reduced recreational opportunities associated with site-related contamination. Compared to the No Action alternative, the environmental impacts of potential projects are anticipated to be minor and in many cases beneficial. Potential sites range from existing formal and informal access areas to historic parks to new access opportunities. Improvements to roads, parking lots, trails, and boat ramps may cause minor short-term impacts to the environment as a result of construction activities but would help to reduce erosion, promote bank stabilization, reduce impacts to riparian vegetation, and improve user safety. Negative impacts would primarily be associated with increased use, which can result in minor increases in traffic, noise, and litter.

This project type has the potential to positively impact the local economy. By increasing fishing access, it is likely that recreation in the area would increase, resulting in corresponding long-term benefits to the recreation, accommodation, and food services industries. In addition, additional fishing access would provide increased opportunities for local urban populations to participate in recreational activities -- opportunities that may not have been previously available.

Erie Canalway Trail

5.4 PREFERRED RESTORATION ALTERNATIVE

The Trustees evaluated two restoration alternatives. Of these, Alternative B best addresses natural resource injuries and service reductions resulting from the release of COCs within the assessment area. Based on the Trustees' evaluation of the environmental consequences of Alternatives A and B, the NRDA restoration factors described in 43 CFR § 11.82(d), and the potential for greater restoration project opportunities, including specifically within and around Onondaga Lake and its associated tributaries and habitats, the Trustees propose Alternative B as their Preferred Alternative.

Any restoration projects that are expected to have non-negligible impacts will be subject to a project-specific NEPA analysis prior to implementation. In addition, a Section 7 consultation (under the Endangered Species Act) will be completed for restoration projects that may affect threatened or endangered species and Section 106 of the National Historic Preservation Act will be followed for each restoration project that will be implemented.

The Trustees will continue to inform the public of restoration project plans and progress and seek public and stakeholder participation and involvement, as appropriate.

Jetties at Onondaga Lake outlet

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APPENDIX A THREATENED AND ENDANGERED SPECIES OF ONONDAGA COUNTY

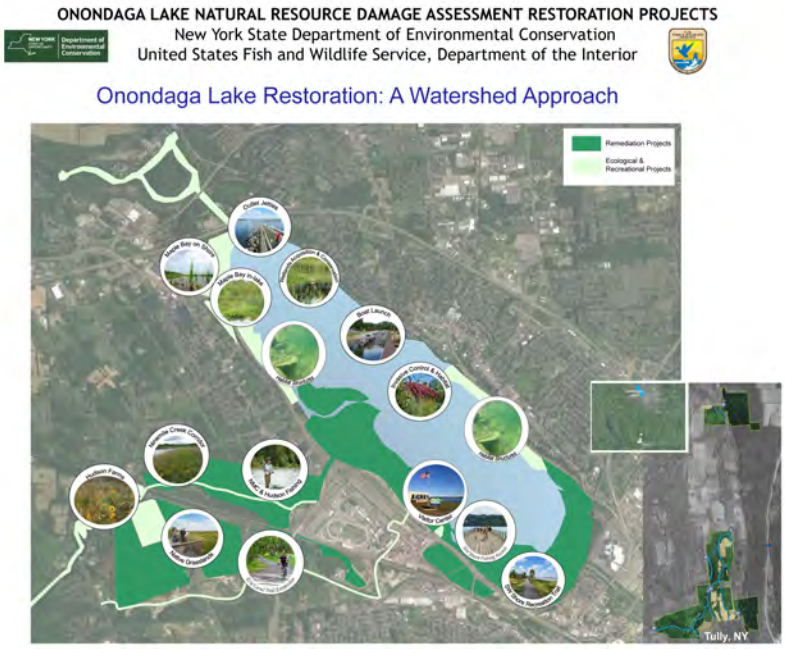
GROUP	COMMON NAME	SCIENTIFIC NAME	STATE PROTECTION STATUS [1]	FEDERAL PROTECTION STATUS [2]
Mammals	Indiana Bat	*Myotis sodalis*	Endangered	Endangered
	Northern Long-eared Bat	*Myotis septentrionalis*	Threatened	Threatened
Birds	Black Tern	*Chlidonias niger*	Endangered	None
	Peregrine Falcon	*Falco peregrinus*	Endangered	None
	Short-eared Owl	*Asio flammeus*	Endangered	None
	Bald Eagle	*Haliaeetus leucocephalus*	Threatened	None
	Common Tern	*Sterna hirundo*	Threatened	None
	Henslow's Sparrow	*Ammodramus henslowii*	Threatened	None
	Least Bittern	*Ixobrychus exilis*	Threatened	None
	Northern Harrier	*Circus cyaneus*	Threatened	None
	Pied-billed Grebe	*Podilymbus podiceps*	Threatened	None
	Sedge Wren	*Cistothorus platensis*	Threatened	None
	Upland Sandpiper	*Bartramia longicauda*	Threatened	None
Reptiles	Bog Turtle	*Glyptemys muhlenbergii*	Endangered	Threatened
	Eastern Massasauga	*Sistrurus catenatus catenatus*	Endangered	Candidate
	Blanding's Turtle	*Emydoidea blandingii*	Threatened	None
	Timber Rattlesnake	*Crotalus horridus*	Threatened	None
Fish	Lake Chubsucker	*Erimyzon sucetta*	Threatened	None
	Lake Sturgeon	*Acipenser fulvescens*	Threatened	None
	Longear Sunfish	*Lepomis megalotis*	Threatened	None
Flowering Plants	American Waterwort	*Elatine americana*	Endangered	None
	Angled Spikerush	*Eleocharis quadrangulata*	Endangered	None
	Bear's-foot	*Smallanthus uvedalius*	Endangered	None
	Broad-lipped Twayblade	*Listera convallarioides*	Endangered	None
	Button-bush Dodder	*Cuscuta cephalanthi*	Endangered	None
	Calypso	*Calypso bulbosa var. americana*	Endangered	None
	Carey's Smartweed	*Persicaria careyi*	Endangered	None
	Cloud Sedge	*Carex haydenii*	Endangered	None
	Cooper's Milkvetch	*Astragalus neglectus*	Endangered	None
	Cranefly Orchid	*Tipularia discolor*	Endangered	None
	Eastern Prairie Fringed Orchid	*Platanthera leucophaea*	Endangered	Threatened
	Fairy Wand	*Chamaelirium luteum*	Endangered	None
	Field Dodder	*Cuscuta campestris*	Endangered	None
Flowering Plants	Glomerate Sedge	*Carex aggregata*	Endangered	None
	Golden Puccoon	*Lithospermum caroliniense var. croceum*	Endangered	None

GROUP	COMMON NAME	SCIENTIFIC NAME	STATE PROTECTION STATUS [1]	FEDERAL PROTECTION STATUS [2]
	Goosefoot Corn-salad	*Valerianella chenopodiifolia*	Endangered	None
	Hair-like Sedge	*Carex capillaris*	Endangered	None
	Heart Sorrel	*Rumex hastatulus*	Endangered	None
	Hooker's Orchid	*Platanthera hookeri*	Endangered	None
	Kentucky Coffee Tree	*Gymnocladus dioicus*	Endangered	None
	Large Twayblade	*Liparis liliifolia*	Endangered	None
	Lindley's Aster	*Symphyotrichum ciliolatum*	Endangered	None
	Marsh Valerian	*Valeriana uliginosa*	Endangered	None
	Michigan Lily	*Lilium michiganense*	Endangered	None
	Northern Bog Violet	*Viola nephrophylla*	Endangered	None
	Northern Wild Comfrey	*Cynoglossum virginianum var. boreale*	Endangered	None
	Nuttall's Tick-trefoil	*Desmodium nuttallii*	Endangered	None
	Orange Fringed Orchid	*Platanthera ciliaris*	Endangered	None
	Possum-haw	*Viburnum nudum var. nudum*	Endangered	None
	Puttyroot	*Aplectrum hyemale*	Endangered	None
	Salt-meadow Grass	*Leptochloa fusca ssp. fascicularis*	Endangered	None
	Sartwell's Sedge	*Carex sartwellii*	Endangered	None
	Scarlet Indian-paintbrush	*Castilleja coccinea*	Endangered	None
	Scirpus-like Rush	*Juncus scirpoides*	Endangered	None
	Scotch Lovage	*Ligusticum scothicum ssp. scothicum*	Endangered	None
	Sea Purslane	*Sesuvium maritimum*	Endangered	None
	Seaside Crowfoot	*Ranunculus cymbalaria*	Endangered	None
	Sheathed Pondweed	*Stuckenia filiformis ssp. occidentalis*	Endangered	None
	Shining Bedstraw	*Galium concinnum*	Endangered	None
	Short's Sedge	*Carex shortiana*	Endangered	None
	Slender Marsh-pink	*Sabatia campanulata*	Endangered	None
	Small White Ladyslipper	*Cypripedium candidum*	Endangered	None
	Small Whorled Pogonia	*Isotria medeoloides*	Endangered	Threatened
	Small Yellow Ladyslipper	*Cypripedium parviflorum var. parviflorum*	Endangered	None
	Small's Knotweed	*Polygonum aviculare ssp. buxiforme*	Endangered	None
	Southern Twayblade	*Listera australis*	Endangered	None
Flowering Plants	Spiny Water-nymph	*Najas marina*	Endangered	None
	Spreading Chervil	*Chaerophyllum procumbens*	Endangered	None
	Sticky False Asphodel	*Triantha glutinosa*	Endangered	None

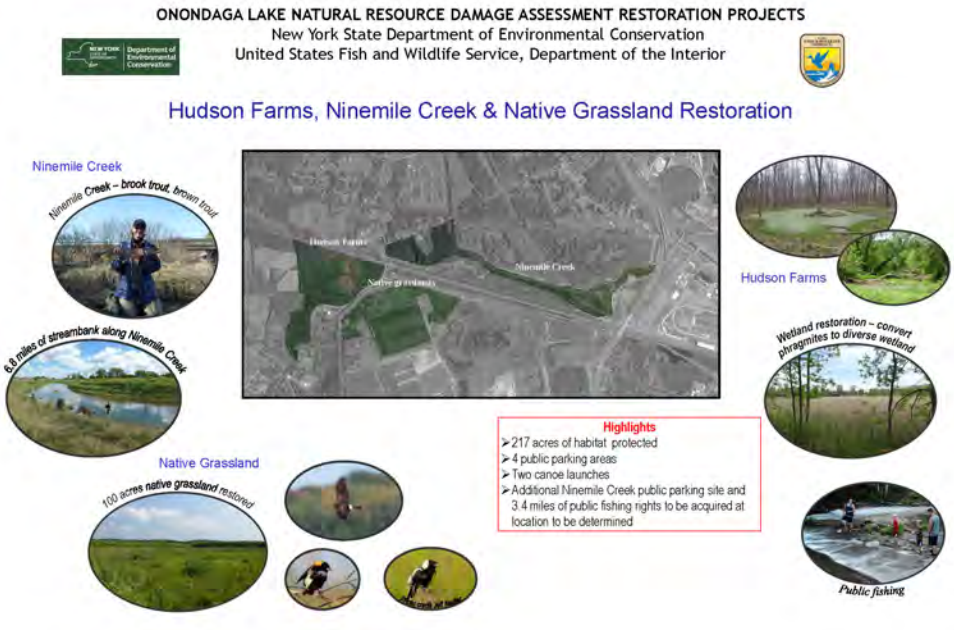
GROUP	COMMON NAME	SCIENTIFIC NAME	STATE PROTECTION STATUS [1]	FEDERAL PROTECTION STATUS [2]
	Stiff Tick-trefoil	*Desmodium obtusum*	Endangered	None
	Straight-leaf Pondweed	*Potamogeton strictifolius*	Endangered	None
	Swamp Smartweed	*Persicaria setacea*	Endangered	None
	Sweet Coltsfoot	*Petasites frigidus var. palmatus*	Endangered	None
	Sweet-scented Indian-plantain	*Hasteola suaveolens*	Endangered	None
	Tall Bellflower	*Campanulastrum americanum*	Endangered	None
	Virginia False Gromwell	*Onosmodium virginianum*	Endangered	None
	Virginia Three-seeded Mercury	*Acalypha virginica*	Endangered	None
	White Basswood	*Tilia americana var. heterophylla*	Endangered	None
	Wild Sweet-william	*Phlox maculata ssp. maculata*	Endangered	None
	Woodland Bluegrass	*Poa sylvestris*	Endangered	None
	Big Shellbark Hickory	*Carya laciniosa*	Threatened	None
	Brown Bog Sedge	*Carex buxbaumii*	Threatened	None
	Cork Elm	*Ulmus thomasii*	Threatened	None
	Creeping Sedge	*Carex chordorrhiza*	Threatened	None
	Dragon's Mouth Orchid	*Arethusa bulbosa*	Threatened	None
	Drummond's Rock-cress	*Boechera stricta*	Threatened	None
	Dwarf Glasswort	*Salicornia bigelovii*	Threatened	None
	Farwell's Water-milfoil	*Myriophyllum farwellii*	Threatened	None
	Glaucous Sedge	*Carex glaucodea*	Threatened	None
	Golden-seal	*Hydrastis canadensis*	Threatened	None
	Great Plains Flatsedge	*Cyperus lupulinus ssp. lupulinus*	Threatened	None
	Knotted Spikerush	*Eleocharis equisetoides*	Threatened	None
	Lake-cress	*Rorippa aquatica*	Threatened	None
	Little-leaf Tick-trefoil	*Desmodium ciliare*	Threatened	None
	Marsh Arrow-grass	*Triglochin palustre*	Threatened	None
	Midland Sedge	*Carex mesochorea*	Threatened	None
	Mountain Death Camas	*Anticlea elegans ssp. glaucus*	Threatened	None
	Nodding Pogonia	*Triphora trianthophora*	Threatened	None
	Northern Bog Aster	*Symphyotrichum boreale*	Threatened	None
	Ohio Goldenrod	*Oligoneuron ohioense*	Threatened	None
	Pink Wintergreen	*Pyrola asarifolia ssp. asarifolia*	Threatened	None
	Purple Cress	*Cardamine douglassii*	Threatened	None
Flowering Plants	Ram's-head Ladyslipper	*Cypripedium arietinum*	Threatened	None
	Red Pigweed	*Chenopodium rubrum*	Threatened	None
	Reflexed Sedge	*Carex retroflexa*	Threatened	None
	Rock-cress	*Draba arabisans*	Threatened	None

GROUP	COMMON NAME	SCIENTIFIC NAME	STATE PROTECTION STATUS [1]	FEDERAL PROTECTION STATUS [2]
	Rough Avens	*Geum virginianum*	Threatened	None
	Saltmarsh Aster	*Symphyotrichum subulatum var. subulatum*	Threatened	None
	Schweinitz's Sedge	*Carex schweinitzii*	Threatened	None
	Seabeach Amaranth	*Amaranthus pumilus*	Threatened	Threatened
	Seaside Bulrush	*Bolboschoenus maritimus ssp. paludosus*	Threatened	None
	Seaside Gerardia	*Agalinis maritima var. maritima*	Threatened	None
	Seaside Plantain	*Plantago maritima var. juncoides*	Threatened	None
	Showy Aster	*Eurybia spectabilis*	Threatened	None
	Slender Blue Flag	*Iris prismatica*	Threatened	None
	Small Bur-reed	*Sparganium natans*	Threatened	None
	Small Floating Bladderwort	*Utricularia radiata*	Threatened	None
	Smooth Bur-marigold	*Bidens laevis*	Threatened	None
	Stargrass	*Aletris farinosa*	Threatened	None
	Swamp Lousewort	*Pedicularis lanceolata*	Threatened	None
	Terrestrial Starwort	*Callitriche terrestris*	Threatened	None
	Troublesome Sedge	*Carex molesta*	Threatened	None
	Twin-leaf	*Jeffersonia diphylla*	Threatened	None
	Wild Pink	*Silene caroliniana ssp. pensylvanica*	Threatened	None
	Woodland Agrimony	*Agrimonia rostellata*	Threatened	None
	Yellow Giant-hyssop	*Agastache nepetoides*	Threatened	None
	Yellow Wild Flax	*Linum sulcatum*	Threatened	None
Conifers	Creeping Juniper	*Juniperus horizontalis*	Endangered	None
Ferns and Fern Allies	Climbing Fern	*Lygodium palmatum*	Endangered	None
	Common Moonwort	*Botrychium lunaria*	Endangered	None
	Mingan Moonwort	*Botrychium minganense*	Endangered	None
	Prairie Dunewort	*Botrychium campestre*	Endangered	None
	Rugulose Grape Fern	*Botrychium rugulosum*	Endangered	None
	Blunt-lobe Grape Fern	*Botrychium oneidense*	Threatened	None
	Hart's-tongue Fern	*Asplenium scolopendrium var. americanum*	Threatened	Threatened
	Marsh Horsetail	*Equisetum palustre*	Threatened	None
Data Sources: [1] NYSDEC, [2] FWS				

APPENDIX B. CONCEPTUAL RESTORATION PROJECTS IN ALTERNATIVE B




ONONDAGA LAKE NATURAL RESOURCE DAMAGE ASSESSMENT RESTORATION PROJECTS
New York State Department of Environmental Conservation
United States Fish and Wildlife Service, Department of the Interior
Southwest Lakeshore Trails
Southwest Shore Angler Access Project Highlights
Improved fishing access along 1.4 miles of shoreline between Onondaga Lake Visitors Center and Harbor Brook, directly accessible from Southwest Shore Recreation Trail
Access gives anglers exposure to deep, moderate and shallow water depths
New 10,000-square-foot gravel parking area to be created
Deep Water Fishing Pier Project Highlights
Floating fishing pier installed to give anglers deep water access along southwestern shore
Connection from fishing pier to Southwest Shoreline Recreation Trail
Annual installation of pier in early spring and removal late fall
Visitors Center Transfer Project Highlights
Maintenance of Onondaga Lake Visitors Center for five years
Picnic area added to lawn area north and east of Visitors Center
Potable water connection installed from County's West Side Pump Station to Visitor's Center
Cold water rinse station to assist in invasive species control efforts


ONONDAGA LAKE NATURAL RESOURCE DAMAGE ASSESSMENT RESTORATION PROJECTS
New York State Department of Environmental Conservation
United States Fish and Wildlife Service, Department of the Interior
Hudson Farms, Ninemile Creek & Native Grassland Restoration
Ninemile Creek
Ninemile Creek – brook trout, brown trout
6.8 miles of streambank along Ninemile Creek
Hudson Farms
Wetland restoration – convert phragmites to diverse wetland
Native Grassland
100 acres native grassland restored
Highlights
217 acres of habitat protected
4 public parking areas
Two canoe launches
Additional Ninemile Creek public parking site and 3.4 miles of public fishing rights to be acquired at location to be determined
Public fishing

ONONDAGA LAKE NATURAL RESOURCE DAMAGE ASSESSMENT RESTORATION PROJECTS

New York State Department of Environmental Conservation
United States Fish and Wildlife Service, Department of the Interior

Maple Bay, On Shore and Outlet Jetty Enhancements

On Shore Habitat Enhancement

- More than 30 acres of wetlands enhanced through control of invasive species and establishment of native plants
- Hundreds of acres of habitat conservation
- Establishment of four vernal pools

Outlet Jetty Enhancements

- Improvement to existing Onondaga Lake outlet jetties to enhance recreational opportunities for anglers and pedestrians
- Gaps in west and east jetties filled with stone and gravel material
- Paved walking path provides access to west jetty from County Bike Trail
- Deck with railings constructed atop portion of east jetty that is located entirely in lake
- Ramp with railings installed to provide access from pedestrian walkway to adjacent lawn area in Onondaga Lake Park
- Walking path installed to connect east jetty to County Park parking lot

Maple Bay In-Lake Habitat Enhancement

- 38 acres of in-lake habitat enhancements, shallow water habitat and shoreline invasive species control
- Wetlands restored to allow for fish spawning
- Wild rice and floating aquatic vegetation introduced in shallow water
- Native floating aquatic species installed in calmer protected areas
- Underwater structure enhancements

ONONDAGA LAKE NATURAL RESOURCE DAMAGE ASSESSMENT RESTORATION PROJECTS

New York State Department of Environmental Conservation
United States Fish and Wildlife Service, Department of the Interior

Tully Recreational Area and Nature Preserve

Highlights

- 1,023 acres of habitat protected
- 11 miles of streambank public access along Onondaga Creek
- 5 new gravel parking areas
- Stream habitat enhancement

ONONDAGA LAKE NATURAL RESOURCE DAMAGE ASSESSMENT RESTORATION PROJECTS

New York State Department of Environmental Conservation
United States Fish and Wildlife Service, Department of the Interior

Erie Canal and Southwest Lakeshore Trails

Southwest Shore Recreation Trail Project Highlights

- New 1.2-mile asphalt trail extension of West Shore Recreation Trail from near Onondaga Lake Visitors Center to Harbor Brook area
- Fencing installed along portions of trail that have a steep bank near water
- Bench seating installed at five locations along trail.

Erie Canal Trail Project Highlights

- Build new 3.2 mile trail connecting Old Erie Canal Trail to existing County Trail
- Preserve Gere Lock as historic site
- Develop 4,200-square-foot gravel public parking area for additional access
- Increase guarding on railing on State Fair Pedestrian bridges over I-690

APPENDIX C. COPIES OF RESTORATION PROPOSALS SUBMITTED IN RESPONSE TO REQUEST FOR PROJECT IDEAS IN 2014/15

Historical Ecology Website Project - Catherine Landis

Supplement to "Project Description" section on NRDA Suggestion Form

I would like to stress here the importance of historical ecology data to move forward with the recovery of Onondaga Lake as a viable community resource. As one author wrote:

> The restoration of natural sites without history threatens to unhinge human communities from the complex cultural, political, and ecological histories of environmental change in which they are embedded. To pursue restoration as a future oriented activity, with no reference to complex local histories of engagement with the environment, strips local communities of the only viable reference point—local knowledge of environmental change— with which they may participate democratically in the restoration process (Alagona et al. 2012).

That is, if the public is to "participate democratically" and provide input for Onondaga Lake restoration, they need to understand the Lake's past including details regarding the human and ecological relationships. This website provides that information in an open access form. It aims to tell stories, based on historical data, about the resource and its dependent players. Community memory is limited and often shadowed by the shifting baselines syndrome, where the larger potential of sites is often forgotten. Without this memory, restoration can become mere "ecological gardening" (Alagona et al. 2012) rather than restoring assemblages of flora and fauna, and the human relationship to them.

Knowing the historical ecology story, on the other hand, can enhance people's sense of place and responsibility to care for it. I grew up in Syracuse and know too well the story of the nation's "most polluted lake," and how the community imagination can get trapped around that image. Ecological, cultural and historical data, as synthesized in this website, can help us understand change and how we can work with change for the benefit of the lake, its biota, and all of us here.

Alagona, P. S., J. Sandlos, and Y. F. Wiersma. 2012. Past Imperfect: Using Historical

Ecology and Baseline Data for Conservation and Restoration Projects in North America. Environmental Philosophy 9:49-70.

Murphy's Island Transfer to Nation

Hi Anne,

Thanks for spending time on the phone with me today and allowing me to update you on SYW-12, Murphy's Island. Attached, please find the copy of the formal resolution passed by the Onondaga County Legislature that pledges its eventual return to the Nation. We have had good support for this project, great press, and virtually no push back. Of course, everything hinges on whether or not the responsible parties are made to thoroughly clean the site for Traditional Use.

RESOLVED, that this Legislature hereby memorializes its support for the eventual transfer of the parcel currently known as Murphy's Island, located on Onondaga Lake, to the Onondaga Nation for Traditional Uses, at no cost to the Nation, upon the satisfactory resolution of all issues attendant to the transfer of said parcel; and, be it further

11.

July 5, 2011

Motion Made By Mr. Corbett, Mrs. Ervin, Mr. Buckel, Mr. Stanczyk, Mr. Kinne, Mr. Laguzza, Mr. Masterpole, Ms. Williams

RESOLUTION NO. 452

MEMORIALIZING COUNTY SUPPORT FOR THE EVENTUAL TRANSFER OF A PARCEL OF LAND ALONG ONONDAGA LAKE TO THE ONONDAGA NATION IN RECOGNITION OF THEIR SACRED INTEREST IN ONONDAGA LAKE AND THE HISTORICALLY SIGNIFICANT EVENTS THAT OCCURRED ON ITS SHORES

WHEREAS, Onondaga Lake is sacred to the Onondaga Nation, and the events that happened along its shores are historically significant to the County of Onondaga, the State of New York, the United States of America, and the rest of the world; and

WHEREAS, a parcel of land owned by the County located beside Onondaga Lake, known as Murphy's Island, is historically significant as it is near the place where the Peace Maker delivered the Great Law of Peace forming the Haudenosaunee Confederacy, the oldest surviving representative democracy in the western world, and near where in 1615, the Onondaga Nation repelled the attack of Samuel de Champlain and his army, forever changing the development of North America and near where in 1779 American troops, under orders of General George Washington, arrived to mount a devastating, surprise attack on Onondaga; and

WHEREAS, in recognition of the sacred nature and historical significance of this parcel, the County of Onondaga desires to pursue the eventual transfer of the parcel to the Onondaga Nation to use the property for Traditional Uses, with such uses including ceremonial gatherings, hunting, fishing, camping, cultivation and harvest of food and medicinal plants, education and passing down of traditions to the Onondaga Nation children, preservation of language and culture, leisure, recreation, sport, worship, wildlife conservation and such other uses as may be agreed upon; and

WHEREAS, before the transfer can happen, the County and the Onondaga Nation agree that it is necessary and prudent to be assured by the New York State Department of Environmental Conservation and by the Haudensaunee Environmental Task Force that the parcel can be remediated to a level that will support the Traditional Uses; and

WHEREAS, if the County and Onondaga Nation agree that the parcel can be satisfactorily remediated to a level that will support the Traditional Uses for which the Onondaga Nation desires to acquire it then the County and the Onondaga Nation will enter into further discussions to resolve any additional issues, including the need for any required state approvals, the release of any environmental claims and the execution and delivery by the Onondaga Nation of a release of claim and covenant not to sue Onondaga County, its officers, agents and employees, for which the Onondaga Nation may acquire or otherwise assert standing to sue by virtue of the transfer of the parcel, and resolution of any other outstanding environmental claims asserted or that could be asserted by state and/or federal agencies; and

WHEREAS, upon satisfactory resolution of all issues attendant to the transfer, it is the desire of the County to provide for the eventual transfer of the parcel known as Murphy's Island to the Onondaga Nation for Traditional Uses, at no cost to the Onondaga Nation; now, therefore be it

RESOLVED, that this Legislature hereby memorializes its support for the eventual transfer of the parcel currently known as Murphy's Island, located on Onondaga Lake, to the Onondaga Nation for Traditional Uses, at no cost to the Nation, upon the satisfactory resolution of all issues attendant to the transfer of said parcel; and, be it further

RESOLVED, that the County Executive is hereby requested to pursue resolution of the additional issues necessary and appropriate to the transfer while remediation of the parcel to a level suitable for Traditional Use remains under consideration by the parties; and, be it further

RESOLVED, that to effectuate the transfer of such parcel to the Onondaga Nation, the County must separately enact a local law reflecting the understanding of the parties at that time and file such law in accordance with Municipal Home Rule Law.

Murphy's Island 6-3-11
km

ADOPTED
JUL 05 2011

I HEREBY CERTIFY THAT THE FOREGOING IS A TRUE AND EXACT COPY OF LEGISLATION DULY ADOPTED BY THE COUNTY LEGISLATURE OF ONONDAGA COUNTY ON THE 5th DAY OF July, 20 11.

Deborah A. Matuso

CLERK, COUNTY LEGISLATURE
ONONDAGA COUNTY, NEW YORK

RECEIVED
ONONDAGA COUNTY
LEGISLATURE
11 JUN 10 AM 9:25

NYSDEC PROPOSALS

Potential Onondaga Lake NRD Projects
NYSDEC
September 2014

The following is a list of potential restoration projects proposed by NYSDEC. Projects vary in specificity and additional information can be provided as needed. There is no priority associated with the list numbering.

1. **Removal and/or remediation of Solvay Wastes along WBs 1-8 not previously addressed by dredging and/or WB 1-8 shoreline work.** Project could include additional dredging and/or habitat restoration/enhancement work. Steps could include:

   a. Identifying areas of untreated Solvay Waste - there could be 20-25 acres of Solvay waste that are not being addressed by dredging, capping or shoreline stabilization. Honeywell may have information necessary to further refine extent of untreated Solvay Waste.

   b. Creating a Restoration Project. Consider:

      i. To what degree should Solvay Waste be dominant in the sediments to consider for removal? There are a number of parameters that could be considered: visual presence, pH measurement, concentrations of Solvay materials.

      ii. -Are the measures taken for "shoreline stabilization" sufficient to describe the area as "treated" or would a restoration project require the removal of the stabilization materials and the underlying Solvay Waste? This could be a determination based on the monitoring results of effectiveness, depending on the timing.

      iii. What depth of removal is appropriate? Because the Wastebeds 1-8 site has artificially extended the shoreline of the lake, the depth of the Solvay Waste materials is expected to be very deep. What would be the limit of the removal and how would the surface be treated after removal.

      iv. How or where would the Solvay Waste that is removed be disposed?[1]

2. **Public Access along Nine Mile Creek.** DEC current has Public Fishing Rights (PFR) and parking facilities along long stretches of Nine Mile. However, from the Amboy dam to the Lake, there is little permanent access for the public. Honeywell currently provides some temporary access to the creek as part of the Wastebed 9-15 Consent Order with the Department. This project ideally would seek public access from the dam to the lake,

[1] There would be significant feasibility issues with dredging and disposal. If done in context of the current remedy by Honeywell there is a timing concern (while remedy is ongoing) and if done outside of the Honeywell dredging and capping remedy permits and other approvals would be necessary.

much of which is Honeywell property. There are also stretches of other private property where PFR and/or parking facilities could be pursued with NRD funding.

3. **Public Access along Onondaga Creek.** DEC current has limited Public Fishing Rights (PFR) and parking facilities along Onondaga Creek. There may be several opportunities for additional access at various locations from the headwaters to the Lake, including Honeywell property located in the Tully Valley. Honeywell currently provides some temporary access to the creek as part of the Wastebed 9-15 Consent Order with the Department. Opportunities could be pursued both for the Honeywell property and various other privately held sections of the creek.
4. **Public Access along other Onondaga Lake Tributaries** – Similar to Nine Mile and Onondaga Creek, consideration should be given to Leycreek, Harbor Brook and perhaps other smaller lake tributaries (Bear Trap?)

5. **Public Access to Honeywell property in Tully Valley.** Honeywell owns approximately 500 Acres of property in the Tully Valley along Onondaga Creek. Consideration should be given to providing public access to this undeveloped parcel either via DEC management, or perhaps local or public land trust ownership. Sportsman have indicated an interest in providing public fishing, hunting and trapping access to this property. Other groups have mentioned public ownership of this land for preservation purposes.

6. **Honeywell property along lake shore (between Harbor Brook and visitor center).** This parcel is the only undeveloped parcel of private land on the lake shore. Adding this parcel as additional public ownership would provide preservation, recreational and perhaps ecological enhancement opportunities. Continuance of the Onondaga Lake Loop trail is expected to go through this parcel, although there is no formal commitment to do so. This may also include access near or on the mouth of Harbor Brook as it runs through the property.

7. **Further development of proposed boat launch site/Visitor Center.** Currently, under the WB 9-15 Consent Order, Honeywell is required to construct a boat launch site at the current location of the Visitor Center. Honeywell is required to construct: 2 ramps for trailer launching, a car top/kayak launch, parking for both individual vehicles and vehicles with trailers, and a universal access fishing platform for deep water shore fishing. Are there other amenities (physical or natural) that we would like developed on this site? For example, is there a future use for the visitor center?

8. **Scientific, Cultural or Historic Center/Museum near shore of Onondaga Lake.** The public has often suggested the development of such a center along or near the shore of the Lake. Note that the Governor just announced funding for a SUNY ESF Water Research and Education Center which is proposed to be built in the Syracuse Inner Harbor. Would it be appropriate to fund specified research related to the Lake's natural resources for this facility?

9. **Restoration/preservation of Murphy's Island** – This is a small undeveloped parcel on the South end of the Lake near Ley Creek and Destiny. The property is owned by Onondaga County and the County Legislature has passed a resolution to consider the possibility of conveying this land to the Onondaga Nation. The parcel does have contamination issues and Honeywell is obligated by Order to complete an investigation and feasibility study of the site. Responsible parties have not been determined for the site, and there may be a desire to further remediate the site to allow for traditional Nation uses. Additional remedial obligations, above any legal obligation Honeywell may have, could be considered for NRD, including habitat improvements. A portion of the property is a regulated wetland which should be considered in further developing the project.

10. **Eagle viewing observation deck** – Given the increased eagle activity on the Lake, there has been a need and demand for a safe and appropriately placed observation area on the lake shore.

11. **Eagle nesting platform** – Audubon had once requested permission to explore the possibility of constructing a platform on the lake to facilitate nesting. Potential areas may have been identified, but there are no current plans for any construction.

12. **Other bird habitat projects** – Wastebeds 1-8 as well as wastebeds 9-15 provide large undeveloped areas near the lake for habitat enhance projects for birds and potentially other wildlife.

13. **Potential for public access around mitigation wetlands** – Is there or should there be potential for access to the mitigation wetlands area on the Wastebed 1-8. Currently the plan references an "eastern shoreline access pathway". This will be a permanent gravel/vegetated access pathway that will be in place when the work is finished. The main purpose is to allow regular access to the groundwater collection structures and system. If it doesn't conflict with the monitoring system, there may be an opportunity to provide recreational or educational access in this area. Currently, there are no specific access paths to the lakeshore, although the road will run close to the lake and will be generally elevated from the surrounding elevations. The property is owned by the County so their plans for this park property should be discussed.

14. **Onondaga Creek Projects** – The existing project data base includes many projects along Onondaga Creek, most of which came out of the Creek Conceptual Plan developed several years ago. The DEC is supportive of many of these concepts, especially those with habitat improvements and renaturalization proposals. Since creek redesign often raises questions about flood impacts, perhaps enhancement or protection of flood plain areas can also be included in some of these projects.

OEI Proposals (Ley Creek, Beartrap Creek, Dorwin Avenue Drop Structure Onondaga Creek, Harbor Brook, Furnace Brook)

Onondaga Lake
Natural Resource Damage Assessment and Restoration
Trustee Council

RESTORATION SUGGESTION FORM

ONONDAGA LAKE NATURAL RESOURCE DAMAGE ASSESSMENT

Background:

The Onondaga Nation, Department of the Interior Fish and Wildlife Service and New York State Department of Environmental Conservation are conducting a natural resource damage assessment at Onondaga Lake. We are in the process of identifying potential projects to restore, replace or compensate for injuries to and lost use of natural resources caused by hazardous substances released in and around Onondaga Lake. We invite you to submit suggestions for restoration projects. Please understand we are currently collecting ideas and suggestions, not funding grant proposals for work to be done by a specific group. Projects that meet these requirements will be evaluated based on:

- Connection to potentially injured resource (proximity, linkage to resources or resource services affected by hazardous substance releases)
- Likelihood of success
- Cost effectiveness
- Ability to produce demonstrable, quantifiable benefits
- Compatibility with Trustee resource management goals

More information about the Natural Resource Damage Assessment can be found at:
http://www.fws.gov/northeast/nyfo/ec/onondaga.htm

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Anne Secord, USFWS
3817 Luker Road, Cortland, NY 13045
Anne_Secord@fws.gov

Your Name: Onondaga Environmental Institute	**Street Address:**
City, State, Zip: Syracuse, NY 13204	**Phone and Email:**

Project Description: Briefly describe project, including objectives, and explain how the project would address potentially injured resources and/or losses to the public.
This project will restore upper Ley Creek to natural conditions and mitigate the effects of urban runoff and pollution. In-stream structures will be installed to restore a more natural flow pattern and reduce sediment transport. Wetlands will be constructed and riparian restoration will be performed to improve nutrient cycling, minimize stream bank erosion and sedimentation, reconnect habitat, increase canopy cover, restore and increase habitat for biota, improve water quality, and increase flood storage capacity. Restoration will foster increased connectivity between Onondaga Lake and Ley Creek and provide more desirable habitat for migratory species identified as important in the Onondaga Lake Habitat Restoration Plan (e.g., Northern pike). With the lower segement of Ley Creek considered a subsite of the Onondaga Lake Clean-up, this project will help to ensure the success of remedial activities and contribute to the holistic restoration of Onondaga Lake and its watershed.

Project Description, continued: Will the restoration project accomplish any of the following (check all that apply):

_X__ Enhance fish habitat and or fish species (e.g., dam removal, fish passage, stocking, spawning habitat, stream improvements).

_X__ Enhance avian resources (e.g., nesting enhancement, species protection, habitat enhancement or protection).

_X__ Enhance, restore, and protect wetland habitat.

_X__ Enhance reptiles and amphibian habitat or increase reptile or amphibian populations.

_X__ Provide invasive species control.

_X__ Enhance or protect rare, threatened and endangered species or species of special concern.

_X__ Enhance or restore terrestrial, aquatic, and/or semi-aquatic mammals or their habitat.

_X__ Provide new or enhanced fishing/boating opportunities.

_X__ Provide new or enhanced natural resource cultural or recreational activities

_X__ Enhance natural resource education/outreach

Project Location and Cost: If you have a specific site in mind, briefly describe location; town/city and county; other identifying landmarks; historic conditions of site; potential cost (if known) and the landowner.
Ley Creek is a low-gradient, urban stream, descending less than 15 m over the course of its total length of 16 km. Ley Creek is a major tributary to Onondaga Lake, whose watershed was predominantly a hardwood swamp prior to major development. The Ley Creek watershed resides within the towns of Dewitt and Salina, NY. The lower segment of Ley Creek is located within the City of Syracuse and is considered a Brownfield Opportunity Area. The North and South branches of Ley Creek originate and flow through the Town of Dewitt's most industrialized and developed areas, including Syracuse Hancock International Airport and the village of East Syracuse. Locations for restoration will include one stretch along the mainstem near Townline Rd, one stretch in the North Branch near E Malloy Rd, several locations in the South Branch near Rte 690, Carr St, Exeter Rd, and Thompson Rd, and at least one site in the tributaries Teall Brook and Sanders Creek. The total cost for this project is estimated at $696,365 or less, depending on the extent and number of resotartion sites. The project duration is anticipated to be 36 months and will include in-stream, riparian, and wetland restoration, as well as potential daylighting at certain stretches. In addition, an education and outreach program will be developed that will engage community members and promote environmental stewardship.

Actions to date: If known, briefly describe any actions, studies, or funding commitments that have already been initiated for this project.
OEI has received funds through the NY Water Quality Improvement Program (~$111,000) to conduct in-stream, riparian, and wetland restoration at 3 sites in the Ley Creek Watershed (project duration: April 2015 - April 2017). Education & outreach activities will also be supported under an EPA Environmental Education grant recieved by OEI (~$134,000). On-going water quality monitoring is being performed by OEI and Onondaga County, as part of the Microbial Trackdown Studies. Initiatives from the Save the Rain Program currently includes tree-planting and rain barrel programs in the Town of Dewitt, which include areas within the Ley Creek Watershed. The Town of Dewitt has added storm water controls at Carrier Park that capture stormwater runoff from within the park and would enhance restoration efforts in the South Branch and Sanders Creek by building flood storage capacity. In addition, the Town of Dewitt has issued a building ordinance, requiring new construction to include designs that can hold and/or withstand a 100-yr flood event. These efforts will help protect in-stream and riparian restoration efforts in the event of significant flooding; particlularly in the highly residential areas of the watershed.

Participants/Contacts: If known, please identify agencies/organizations likely to participate in or are knowledgeable about the project.
Organizations familar with the project and/or likely to participated include:

- Onondaga Environmental Institute
- NYS DEC
- Onondaga Co. Water Environment Protection
- Haudenosaunee Environmental Task Force
- Natural Systems Engineering
- Town of Dewitt
- Town of Salina
- Onondaga Co. Soil & Water Consevation Dist.
- Onondaga-Madison Co. BOCES
- 174th National Guard
- Bristol-Myers Squibb
- Dupli Graphics
- Carrier Corporation
- Onondaga Earth Corps
- Izaak Walton League
- Cornell Cooperative Extension
- East Syracuse-Minoa School District
- Dewitt Rotary
- Girl Scouts
- Audubon
- SUNY-ESF
- LeMoyne College
- Homeowners in the East Syracuse, Park Hill, Franklin Park, Dunrovan, and Parkwood Neighborhoods

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Onondaga Lake
Natural Resource Damage
Assessment and Restoration
Trustee Council

RESTORATION SUGGESTION FORM

ONONDAGA LAKE NATURAL RESOURCE DAMAGE ASSESSMENT

Background:

The Onondaga Nation, Department of the Interior Fish and Wildlife Service and New York State Department of Environmental Conservation are conducting a natural resource damage assessment at Onondaga Lake. We are in the process of identifying potential projects to restore, replace or compensate for injuries to and lost use of natural resources caused by hazardous substances released in and around Onondaga Lake. We invite you to submit suggestions for restoration projects. Please understand we are currently collecting ideas and suggestions, not funding grant proposals for work to be done by a specific group. Projects that meet these requirements will be evaluated based on:

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Your Name: Onondaga Environmental Institute	Street Address:
City, State, Zip: Syracuse, NY 13204	Phone and Email:

Project Description: Briefly describe project, including objectives, and explain how the project would address potentially injured resources and/or losses to the public.
This project would expand upon the recent restoration work conducted in Beartrap Creek by the Izaak Walton League and enhance restoration efforts in the Ley Creek Watershed. Recent efforts have included in-steam structures to restore habitat for brown trout. The objectives of this study are to: (1) restore in-stream habitat that would expand and enhance recently restored locations, (2) improve riparian habitat along the Beatrap Creek corridor to increase canopy cover, minimize erosion, and buffer the stream from urban runoff, (3) support the Izaak Walton League's educational opportunities in Beartrap Creek, and (4) contribute data to Project Watershed to better understand long-term spatial and temporal changes in stream condition and guide recommendations for furture studies that would contribute to the revitalization of the entire Ley Creek Watershed.

Project Description, continued: Will the restoration project accomplish any of the following (check all that apply):

_X_ Enhance fish habitat and or fish species (e.g., dam removal, fish passage, stocking, spawning habitat, stream improvements).

_X_ Enhance avian resources (e.g., nesting enhancement, species protection, habitat enhancement or protection).

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_X_ Provide new or enhanced fishing/boating opportunities.

_X_ Provide new or enhanced natural resource cultural or recreational activities.

_X_ Enhance natural resource education/outreach

Project Location and Cost: If you have a specific site in mind, briefly describe location; town/city and county; other identifying landmarks; historic conditions of site; potential cost (if known) and the landowner.
Beartrap Creek is a small urban stream (5 km) that is a tributary to Ley Creek. The headwaters originate near a swamp adjacent to Hancock Airport, where it then flows adjacent to Rte 81 behind Northern Lights Plaza in Mattydale and other commercial and residential properties, discharging to Ley Creek at 7th North St. The creek historically supported a natural brown trout fishery. In recent decades, urban pollution, including runoff from the airport and highways and habitat degration due to development severely impaired water quality, resulting in the loss of sensitive fish and inverterbrate species. Recent efforts to restore Beartrap Creek has led to improvements in habitat quality and aquatic invertebrate composition. However, results still show signs of impairment and the successful establishment of brown trout is not evident. This study proposes to restore in-stream and riparian habitat downstream of areas of recent restoration, in an effort to increase the amount of suitable habitat for fish. Riparian restoration will also occur at restored locations, in an effort to regulate stream temperatures and mitigate the effects of urban runoff (e.g., road salts); creating habitat conditions suitable for long-term, sustainable populations of sensitive and ecologically and recreationally important fish species, such as brown trout. The estimated cost for this project is $75,000.

Actions to date: If known, briefly describe any actions, studies, or funding commitments that have already been initiated for this project.
Restoration of Beartrap Creek was conducted at 5 locations between 2010 and 2012. A number of surveys have been performed in Beartrap Creek as result of these projectects. Additional restoration and monitoring work is scheduled for 2015, and will include in-stream restoration near Brookfield Rd. Data collected as part of Project Watershed will be used to evaluate long-term trends in stream quailty in response to restoration.

Participants/Contacts: If known, please identify agencies/organizations likely to participate in or are knowledgeable about the project.
Onondaga Environmental Institute, Town of Salina, NYSDEC, Onondaga County Dept. Water Environment Protection, Onondaga County Soil & Water Conservation District, Natural Systems Engineering, Izaak Walton League, Trout Unlimited, Project Watershed, Onondaga Earth Corps, Audubon, SUNY-ESF, and LeMoyne College.

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Onondaga Lake
Natural Resource Damage
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Trustee Council

RESTORATION SUGGESTION FORM

ONONDAGA LAKE NATURAL RESOURCE DAMAGE ASSESSMENT

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Your Name: Onondaga Environmental Institute	**Street Address:**
City, State, Zip: Syracuse, NY 13204	**Phone and Email:**

Project Description: Briefly describe project, including objectives, and explain how the project would address potentially injured resources and/or losses to the public.

This project proposes to install a fish ladder at the Dorwin Ave drop structure in Onondaga Creek. The drop structure at Dorwin Ave was installed to regulate stream flows, prevent flooding in the City of Syracuse, and minimize erosional forces at the bridge buttresses for Dorwin Ave. The current design of the drop structure impedes fish migration and likely prevents many fish species from returning to their natal spawning grounds in the Upper Onondaga Creek Watershed. Ecologically, culturally, and recreationally valuable fish species such as brown trout, brook trout, Atlantic salmon, and Lake sturgeon populations are greatly reduced or completely extirpated from the Onondaga Creek and Onondaga Lake Watersheds. By removing physical barriers to spawning and nesting habitats, it is possible to restore and enhance populations throughout the watershed that are otherwise restricted to fragmented habitats in Onondaga Creek. This could have important implications for the Onondaga Lake fishery.

Project Description, continued: Will the restoration project accomplish any of the following (check all that apply):

_X_ Enhance fish habitat and or fish species (e.g., dam removal, fish passage, stocking, spawning habitat, stream improvements).

___ Enhance avian resources (e.g., nesting enhancement, species protection, habitat enhancement or protection).

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___ Enhance reptiles and amphibian habitat or increase reptile or amphibian populations.

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___ Enhance or protect rare, threatened and endangered species or species of special concern.

___ Enhance or restore terrestrial, aquatic, and/or semi-aquatic mammals or their habitat.

_X_ Provide new or enhanced fishing/boating opportunities.

_X_ Provide new or enhanced natural resource cultural or recreational activities.

___ Enhance natural resource education/outreach

Project Location and Cost: If you have a specific site in mind, briefly describe location; town/city and county; other identifying landmarks; historic conditions of site; potential cost (if known) and the landowner.
The drop structure in Onondaga Creek is located immedately upstream of Dorwin Ave, adjacent to Kelley Brothers Park on the City of Syracuse and Nedrow border. The structure is approximately 7 ft high and extends 50 ft between the upstream and downstream edges. Currently, there are no structures in place to facilitate the migration of fish to the upper watershed, serving as major impediment. This study proposes to evalute, design, and construct a fish ladder that would allow successful fish passage. In addition, a short-term (2-yr) monitoring and maintenance program would be designed and implemented to evaluate the efficacy of the fish ladder and monitor fish community composition above and below the drop structure, as well as fish migration (via a fish mark/recapture study). The estimated cost for this project is $390,600.

Actions to date: If known, briefly describe any actions, studies, or funding commitments that have already been initiated for this project.
Biological monitoring was conducted by OEI in 2007 above and below the Dorwin Ave drop structure, the data of which will serve as a baseline comparison of fish community structure prior to the installation of the fish ladder. In addition, fish sampling is scheduled for the summer of 2015 that will include locations in the Onondaga Creek Watershed above and below Dorwin Ave. Data collected from the Microbial Trackdown (OEI 2008-2015) and Upper Onondaga Creek Study (OEI,2012) will be used to assess spatial and temporal changes in water quality and assess what impact, if any, the addition of a fish ladder may have on stream condition. Public input during the development of the Onondaga Creek Conceptual Revitalization Plan (OEI, 2009), identified the public's desires for more recreation and fishing opportunities in Onondaga Creek, as well as wanting to see the restoration of historic, native fishes.

Participants/Contacts: If known, please identify agencies/organizations likely to participate in or are knowledgeable about the project.
Onondaga Environmental Institute, NYS DEC, City of Syracuse, Onondaga County Dept. of Water Environment Protection, Onondaga Nation, Haudenosaunee Environmental Task Force, Town of Onondaga, Onondaga County Soil & Water Conservation District, Natural Systems Engineering, Izaak Walton League, Trout Unlimited, Carpenters Brook Fish Hatchery, Cornell Cooperative Extension, Tunison Labs, SUNY-ESF, and LeMoyne College.

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Onondaga Lake
Natural Resource Damage
Assessment and Restoration
Trustee Council

RESTORATION SUGGESTION FORM

ONONDAGA LAKE NATURAL RESOURCE DAMAGE ASSESSMENT

Background:

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Your Name: Onondaga Environmental Institute	
City, State, Zip: Syracuse, NY 13204	

Project Description: Briefly describe project, including objectives, and explain how the project would address potentially injured resources and/or losses to the public.

Recent studies have found that the upper watershed is impaired by agricultural inputs, sedimentation, and development. In addition, biological sampling efforts have shown the gradual extirpation of recreationally and culturally signficant species, such as the NYS Fish, brook trout (Salvelinus fontinalis). This project proposes to restore in-stream, wetland, and riparian habitat in the Upper Onondaga Creek Watershed, with the goal of restoring plant, fish, and wildlife species of ecological and cultural importance. This study would include (but not be limited to): (1) installing in-stream habitat, such as cobble substrate, j-hook, cross veins, and bendway-weirs to increase and enhance suitable habitat for biota in the mainstem and tributaries; (2) creating and enhancing wetland habitat along the Onondaga Creek mainstem corridor, West Branch, and other important tributaries to increase habitat for waterfowl, restore native vegetation, provide fish spawning and nursery habitat, increase flood storage capacity and sediment retention; (3) restore riparian zones by planting native vegetation in an effort to stabilize steam banks, buffer zones of development and agriculture, thereby reducing runoff, increase canopy cover; which will help to regulate stream temperatures and help off-set the impacts caused by climate change. Restoring ecological conditions in the Upper Watershed will not only enhance recreational opportunities, but it will restore species that are of cultural significance to the Onondaga Nation.

Project Description, continued: Will the restoration project accomplish any of the following (check all that apply):

_X_ Enhance fish habitat and or fish species (e.g., dam removal, fish passage, stocking, spawning habitat, stream improvements).

_X_ Enhance avian resources (e.g., nesting enhancement, species protection, habitat enhancement or protection).

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_X_ Provide invasive species control.

_X_ Enhance or protect rare, threatened and endangered species or species of special concern.

_X_ Enhance or restore terrestrial, aquatic, and/or semi-aquatic mammals or their habitat.

_X_ Provide new or enhanced fishing/boating opportunities.

_X_ Provide new or enhanced natural resource cultural or recreational activities

_X_ Enhance natural resource education/outreach

Project Location and Cost: If you have a specific site in mind, briefly describe location; town/city and county; other identifying landmarks; historic conditions of site; potential cost (if known) and the landowner.
The Upper Onondaga Creek Watershed resides within the Towns of Tully, Lafayette, Onondaga, and the Onondaga Nation. Land use is a fairly even mix of forest and agriculture. Target sites for restoration include the West Branch (Town of Onondaga), locations in the mainstem within the Honeywell property, Kennedy Creek (Town of Lafayette), and Onondaga Nation Council-approved locations within the Onondaga Nation territory that are of concern and interest for Nation members. Historically, the upper watershed supported a diverse, coldwater fish community that included brook trout, Atlantic salmon, American eel, and lake sturgeon. Recent studies suggest that successful colonization of aquatic biota are not limited by stream temperatures or dissolved oxygen, but are rather impaired by habitat degradation. Similarly the loss or fragmentation of wetlands has resulted in the loss of critically valuable habitat for birds, reptiles and amphibians, and fishes. Existing wetlands are currently dominated by the invasive Phragmites. Previous studies and field visits suggest that minimal improvements to habitat select locations (e.g., West Branch) could significantly improve the ecological condition. To achieve all these objectives, total project cost is estimated at $725,000, with in-stream restoration costing $225,000, riparian restoration at $175,000, and wetland restoration and creation at $325,000. Project costs include education and outreach opportunities as well.

Actions to date: If known, briefly describe any actions, studies, or funding commitments that have already been initiated for this project.
An extensitve number of surveys have been performed in Onondaga Creek, including the Onondaga Lake TMDL Survey (OEI, 2007), the Onondaga Creek Conceptual Revitalization Plan (OEI, 2009), a habitat reconnaissance study of the Flood Control Dam (USACE, 2011), the Upper Onondaga Creek Study (OEI 2012), the Microbial Trackdown Studies (OEI, 2008-2015), and routine biological surveys performed by the NYS DEC; all of which provides an extensive dataset of the biological, chemical, and physical conditions of the watershed, and will help guide site selections. OEI has secured funding (~$178,000) through the Sustain Our Great Lake Initiative to restore habitat for the native brook trout. Restoration work is scheduled to begin in late summer 2015, and will provide the foundation for future restoration work in the upper watershed.

Participants/Contacts: If known, please identify agencies/organizations likely to participate in or are knowledgeable about the project.
Onondaga Environmental Institute, Onondaga Nation, Haudenosaunee Environmental Task Force (HETF), NYS DEC, Town of Tully,Town of Lafayette, Town of Onondaga, Onondaga County Soil & Water Conservation District, SUNY-ESF, LeMoyne College, Natural Systems Engineering, Izaak Walton League, Onondaga Earth Corps, Audubon, Carpenters Brook Fish Hatchery, Trout Unlimited, NY Sturgeon for Tomorrow, Cornell Cooperative Extension, Project Watershed, Tunison Labs.

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Onondaga Lake
Natural Resource Damage
Assessment and Restoration
Trustee Council

RESTORATION SUGGESTION FORM

ONONDAGA LAKE NATURAL RESOURCE DAMAGE ASSESSMENT

Background:

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Your Name: Onondaga Environmental Institute	**Street Address:**
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Project Description: Briefly describe project, including objectives, and explain how the project would address potentially injured resources and/or losses to the public.
The Harbor Brook Watershed has been a comparatively neglected tributary to Onondaga Lake, suffering from industrial and domestic pollution. In the upper watershed, water quality is unimpaired and supports a natural brown trout population. One major hinderance to improving the biological health downstream, is the diversion of large sections of the creek underground between Delaware St and Hiawatha Blvd. Daylighting these segments of Harbor Brook not only has the potential to restore the creek proper, but to also restore ecological connectivity with Onondaga Lake and enhance the recreational and aesthetic value of Harbor Brook. This study proposes to perform a feasibility analysis of daylighting Harbor Brook, that would include (but not be limited to) reviewing existing conditions, performing a cost-benefits analysis and environmental impact assessment, identifying alternatives, and developing conceptual designs.

Project Description, continued: Will the restoration project accomplish any of the following (check all that apply):

_X__ Enhance fish habitat and or fish species (e.g., dam removal, fish passage, stocking, spawning habitat, stream improvements).

_X__ Enhance avian resources (e.g., nesting enhancement, species protection, habitat enhancement or protection).

____ Enhance, restore, and protect wetland habitat.

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_X__ Provide new or enhanced natural resource cultural or recreational activities

_X__ Enhance natural resource education/outreach

Project Location and Cost: If you have a specific site in mind, briefly describe location; town/city and county; other identifying landmarks; historic conditions of site; potential cost (if known) and the landowner.
Harbor Brook (town of Onondaga and City of Syracuse) is a minor tributary to Onondaga Lake that has a predominantly rural upper subwatershed and an urban lower subwatershed. The tributary is impacted by Combined Sewer Overflows (CSOs), as well as impacts caused by urbanization (e.g., high stream conductivity levels, channelization, habitat degradation). Furthermore, areas around the tributary outlet have been impaired, and subsequently remediated, due to industrial pollution. This study would examine the feasibility of daylighting Harbor Brook Brook between Delaware St and Hiawatha Blvd. The estimated cost for this study is $186,400 (project duration 30 months).

Actions to date: If known, briefly describe any actions, studies, or funding commitments that have already been initiated for this project.
In 2007, Onondaga Environmental Institute performed a comprehensive survey of the ecological condition of Harbor Brook. In addition, on-going water quality monitoring is being performed by OEI and Onondaga County, as part of the Microbial Trackdown Studies. The data collected from both of these studies will help serve as a baseline for stream quality and contribute to the expected environmental benefits assessment.

Participants/Contacts: If known, please identify agencies/organizations likely to participate in or are knowledgeable about the project.
Organizations familar with the project and/or likely to participated include:
- Onondaga Environmental Institute
- Natural Systems Engineering
- City of Syracuse
- Onondaga County Soil & Water Conservation District
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City, State, Zip: Syracuse, NY 13204	

Project Description: Briefly describe project, including objectives, and explain how the project would address potentially injured resources and/or losses to the public.

Furnace Brook is an entirely urban stream that is a tributary to Onondaga Creek. A survey of biological quality in 2007 found Furnace Brook to support a signficant, natural population of brown trout, with minimal water quality impairments. Located in the City of Syracuse, Furnace Brook is diverted underground at Elmwood Park and discharges to Onondaga Creek above creek level - disconnecting from Ononaga Creek and preventing fish migration. Daylighting Furnace Brook not only has the potential to restore ecological condition in the creek proper, but could reconnect it to Onondaga Creek. This would significantly increase habitat for migrating fishes, and could improve brown trout population in Onondaga Creek and Onondaga Lake. Daylighting would also increase recreational accessibility and awareness. This study proposes to perform a feasibility analysis of daylighting Furnace Brook, that would include (but not limited to) reviewing exsiting conditions, perform a cost-benefits analysis and environmental impact assessement, identify alternatives, and develop conceptual designs.

Project Description, continued: Will the restoration project accomplish any of the following (check all that apply):

_X_ Enhance fish habitat and or fish species (e.g., dam removal, fish passage, stocking, spawning habitat, stream improvements).

_X_ Enhance avian resources (e.g., nesting enhancement, species protection, habitat enhancement or protection).

___ Enhance, restore, and protect wetland habitat.

_X_ Enhance reptiles and amphibian habitat or increase reptile or amphibian populations.

___ Provide invasive species control.

_X_ Enhance or protect rare, threatened and endangered species or species of special concern.

_X_ Enhance or restore terrestrial, aquatic, and/or semi-aquatic mammals or their habitat.

_X_ Provide new or enhanced fishing/boating opportunities.

_X_ Provide new or enhanced natural resource cultural or recreational activities

_X_ Enhance natural resource education/outreach

Project Location and Cost: If you have a specific site in mind, briefly describe location; town/city and county; other identifying landmarks; historic conditions of site; potential cost (if known) and the landowner.
Furnace Brook (City of Syracuse) is an urban tributary to Onondaga Creek that discharges to Onondaga Creek north of Elmhurst Ave. Upstream of Glenwood Ave, the brook is a minimally impacted stream that is dominated by brown trout. Furnace brook flows through Elmwood Park, which is a small urban park that serves as a unique and valuable recreational fishing site for the City residents. Downstream of Glenwood Ave, Furnace Brook is diverted underground until its point of discharge to Onondaga Creek, which occurs above creek level - disconnecting Onondaga Creek from this subwatershed, fragmenting habitat and preventing fish migration. This study proposes to perform a feasibility analysis of daylighting Furnace Brook and reconnecting it to Onondaga Creek. The estimated cost for this study is $163,900 (30 months), and will include public outreach and participation.

Actions to date: If known, briefly describe any actions, studies, or funding commitments that have already been initiated for this project.
In 2007, Onondaga Environmental Institute (OEI) performed a survey of the ecological condition of Furnace Brook. In addition, water quality monitoring is being performed by OEI and Onondaga County as part of the Microbial Trackdown Studies, where the outfall for Furnace Brook is monitored several times a year for bacteria and water quality. The data collected from both of these studies will help serve as a baseline for stream quality and contribute to the expected environmental benefits assessment. In addition, public input during the development of the Onondaga Creek Conceptual Revitalization Plan (OEI, 2009) identifed the public's desires to see Furnace Brook daylighted, so as to provide more recreational and fishing opportunities, as well as improving overall aesthetics and property values.

Participants/Contacts: If known, please identify agencies/organizations likely to participate in or are knowledgeable about the project.
- OEI
- Natural Systems Engineering
- City of Syracuse
- Onondaga County Soil & Water Conservation District
- SUNY-ESF
- Izaak Walton League
- Trout Unlimited

PLEASE NOTE: THIS IS NOT A REQUEST FOR PROPOSALS. CONSIDERATON OR SELECTION OF A PROJECT DOES NOT IMPLY THAT THE GROUP SUGGESTING THE PROJECT WILL BE CHOSEN FOR PROJECT IMPLEMENTATION. THANK YOU FOR YOUR TIME AND IDEAS!

Pumpkin Hollow Preserve

Onondaga Lake
Natural Resource Damage
Assessment and Restoration
Trustee Council

RESTORATION SUGGESTION FORM

ONONDAGA LAKE NATURAL RESOURCE DAMAGE ASSESSMENT

Background:

The Onondaga Nation, Department of the Interior Fish and Wildlife Service and New York State Department of Environmental Conservation are conducting a natural resource damage assessment at Onondaga Lake. We are in the process of identifying potential projects to restore, replace or compensate for injuries to and lost use of natural resources caused by hazardous substances released in and around Onondaga Lake. We invite you to submit suggestions for restoration projects. Please understand we are currently collecting ideas and suggestions, not funding grant proposals for work to be done by a specific group. Projects that meet these requirements will be evaluated based on:

- Connection to potentially injured resource (proximity, linkage to resources or resource services affected by hazardous substance releases)
- Likelihood of success
- Cost effectiveness
- Ability to produce demonstrable, quantifiable benefits
- Compatibility with Trustee resource management goals

More information about the Natural Resource Damage Assessment can be found at:
http://www.fws.gov/northeast/nyfo/ec/onondaga.htm

Instructions:
Please complete as many sections as possible. Your suggestion will be considered even if you are unable to fill out every section. If you need more space, please use additional paper and label appropriate sections. This form is also available on the web at: http://www.fws.gov/northeast/nyfo/ec/onondaga.htm. Send completed forms to:
Anne Secord, USFWS
3817 Luker Road, Cortland, NY 13045
Anne_Secord@fws.gov

Your Name: Meredith Perreault, Executive Director Central New York Land Trust	**Street Address:**
City, State, Zip: Syracuse, NY 13290	**Phone and Email:**

Project Description: Briefly describe project, including objectives, and explain how the project would address potentially injured resources and/or losses to the public.

Title: Pumpkin Hollow Biopreserve
a. Purpose: Cooperative protection of habitat in Pumpkin Hollow and Cedarvale Creek in the Onondaga Creek watershed, Town of Onondaga.
b. Goals: Wetland/floodplain species protection and restoration and biopreserve creation to protect sensitive habitat that hosts rare species of orchids and breeding/nesting area of Louisiana waterthrush; public education about sensitive habitat.
c. Objectives:
i. Work with landowners to establish conservation easements and habitat protection measures in this area;
ii. Perform active land management in existing protected areas and newly eased properties, including:
1. Increasing public enjoyment opportunities through connectivity and education projects;
2. Improving habitat through invasive species control and restoration projects;
d. Benefits: Improved protection for protected species or sensitive or unique habitats, linkage to injured resources or associated services, habitat connectivity, increased public enjoyment and use of natural resources.

Project Description, continued: Will the restoration project accomplish any of the following (check all that apply):

___ Enhance fish habitat and or fish species (e.g., dam removal, fish passage, stocking, spawning habitat, stream improvements).
_X_ Enhance avian resources (e.g., nesting enhancement, species protection, habitat enhancement or protection).
_X_ Enhance, restore, and protect wetland habitat.
_X_ Enhance reptiles and amphibian habitat or increase reptile or amphibian populations.
_X_ Provide invasive species control.
_X_ Enhance or protect rare, threatened and endangered species or species of special concern.
___ Enhance or restore terrestrial, aquatic, and/or semi-aquatic mammals or their habitat.
___ Provide new or enhanced fishing/boating opportunities.
_X_ Provide new or enhanced natural resource cultural or recreational activities
_X_ Enhance natural resource education/outreach

Project Location and Cost: If you have a specific site in mind, briefly describe location; town/city and county; other identifying landmarks; historic conditions of site; potential cost (if known) and the landowner.

The Pumpkin Hollow Biopreserve project site is near the West Branch tributary of Onondaga Creek, in the Town of Onondaga.

Cost estimates will require working with NRDAR Trustees to determine desired scope of this project.

Actions to date: If known, briefly describe any actions, studies, or funding commitments that have already been initiated for this project.

Note: This "Central New York Stewardship Collaborative" proposal is based on the Onondaga Creek Conceptual Revitalization Plan and listed as Project # 86 in the Onondaga Lake Proposed Restoration and Redevelopment Project Database.

Participants/Contacts: If known, please identify agencies/organizations likely to participate in or are knowledgeable about the project.

Central New York Land Trust proposes this list with the caveat that consultation with Onondaga Lake NRDAR Trustees would be essential to determine the full complement of likely participants.
Likely to participate:
Regional land trusts and land care groups
Environmental organizations, clubs & nonprofits
Outdoors and sportsmen's clubs
Schools, university students, and youth groups
Gardening/native plant organizations
Restoration projects may recruit organizations who have or wish to acquire restoration skills.

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West Branch Onondaga Creek Public Access Park

Onondaga Lake
Natural Resource Damage
Assessment and Restoration
Trustee Council

RESTORATION SUGGESTION FORM

ONONDAGA LAKE NATURAL RESOURCE DAMAGE ASSESSMENT

Background:

The Onondaga Nation, Department of the Interior Fish and Wildlife Service and New York State Department of Environmental Conservation are conducting a natural resource damage assessment at Onondaga Lake. We are in the process of identifying potential projects to restore, replace or compensate for injuries to and lost use of natural resources caused by hazardous substances released in and around Onondaga Lake. We invite you to submit suggestions for restoration projects. Please understand we are currently collecting ideas and suggestions, not funding grant proposals for work to be done by a specific group. Projects that meet these requirements will be evaluated based on:

- Connection to potentially injured resource (proximity, linkage to resources or resource services affected by hazardous substance releases)
- Likelihood of success
- Cost effectiveness
- Ability to produce demonstrable, quantifiable benefits
- Compatibility with Trustee resource management goals

More information about the Natural Resource Damage Assessment can be found at:
http://www.fws.gov/northeast/nyfo/ec/onondaga.htm

Instructions:
Please complete as many sections as possible. Your suggestion will be considered even if you are unable to fill out every section. If you need more space, please use additional paper and label appropriate sections. This form is also available on the web at: http://www.fws.gov/northeast/nyfo/ec/onondaga.htm. Send completed forms to:

Anne Secord, USFWS
3817 Luker Road, Cortland, NY 13045
Anne_Secord@fws.gov

Your Name: Meredith Perreault, Executive Director Central New York Land Trust	**Street Address:**
City, State, Zip: Syracuse, NY 13290	**Phone and Email:**

Project Description: Briefly describe project, including objectives, and explain how the project would address potentially injured resources and/or losses to the public.

Title: West Branch Public Access Park
a. Purpose: Develop fishing access and create accessible park on Central New York Land Trust-owned "South Onondaga Marsh" preserve.
b. Goals: Increase public recreational access on the West Branch of Onondaga Creek.
c. Objectives:
   i. Design and establish parking area, trail system, and way-finding and educational signage for preserve.
   ii. Design and establish fishing access area on West Branch shore at the preserve.
   iii. Perform active land management in existing protected area, including:
      1. Increasing public enjoyment opportunities through connectivity and education projects;
      2. Improving habitat through invasive species control and aquatic/wetland restoration projects;
d. Benefits: Linkage to injured resources or associated services, habitat connectivity, increased public enjoyment and use ofnatural resources.

Project Description, continued: Will the restoration project accomplish any of the following (check all that apply):

- X Enhance fish habitat and or fish species (e.g., dam removal, fish passage, stocking, spawning habitat, stream improvements).
- ___ Enhance avian resources (e.g., nesting enhancement, species protection, habitat enhancement or protection).
- X Enhance, restore, and protect wetland habitat.
- X Enhance reptiles and amphibian habitat or increase reptile or amphibian populations.
- X Provide invasive species control.
- ___ Enhance or protect rare, threatened and endangered species or species of special concern.
- ___ Enhance or restore terrestrial, aquatic, and/or semi-aquatic mammals or their habitat.
- X Provide new or enhanced fishing/boating opportunities.
- X Provide new or enhanced natural resource cultural or recreational activities
- X Enhance natural resource education/outreach

Project Location and Cost: If you have a specific site in mind, briefly describe location; town/city and county; other identifying landmarks; historic conditions of site; potential cost (if known) and the landowner.

The West Branch Public Access Park project site is located at Hogsback Road and Route 80, on the West Branch tributary of Onondaga Creek, in the Town of Onondaga.

Cost estimates will require working with NRDAR Trustees to determine desired scope of this project.

Actions to date: If known, briefly describe any actions, studies, or funding commitments that have already been initiated for this project.

Note: This "Central New York Stewardship Collaborative" proposal is based on the Onondaga Creek Conceptual Revitalization Plan and listed as Project # 88 in the Onondaga Lake Proposed Restoration and Redevelopment Project Database.

Participants/Contacts: If known, please identify agencies/organizations likely to participate in or are knowledgeable about the project.

Central New York Land Trust proposes this list with the caveat that consultation with Onondaga Lake NRDAR Trustees would be essential to determine the full complement of likely participants.
Likely to participate:
Environmental organizations, clubs & nonprofits
Outdoors and sportsmen's clubs
Schools, university students, and youth groups
Gardening/native plant organizations
Restoration projects may recruit organizations who have or wish to acquire restoration skills.

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habitat connectivity, increased public enjoyment and use of natural resources, long-term coordinated structure for land stewardship and invasive species control.

Stewardship/Grant Program

Onondaga Lake
Natural Resource Damage Assessment and Restoration
Trustee Council

RESTORATION SUGGESTION FORM
ONONDAGA LAKE NATURAL RESOURCE DAMAGE ASSESSMENT

Background:

The Onondaga Nation, Department of the Interior Fish and Wildlife Service and New York State Department of Environmental Conservation are conducting a natural resource damage assessment at Onondaga Lake. We are in the process of identifying potential projects to restore, replace or compensate for injuries to and lost use of natural resources caused by hazardous substances released in and around Onondaga Lake. We invite you to submit suggestions for restoration projects. Please understand we are currently collecting ideas and suggestions, not funding grant proposals for work to be done by a specific group. Projects that meet these requirements will be evaluated based on:

- Connection to potentially injured resource (proximity, linkage to resources or resource services affected by hazardous substance releases)
- Likelihood of success
- Cost effectiveness
- Ability to produce demonstrable, quantifiable benefits
- Compatibility with Trustee resource management goals

More information about the Natural Resource Damage Assessment can be found at:
http://www.fws.gov/northeast/nyfo/ec/onondaga.htm

Instructions:
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Anne Secord, USFWS
3817 Luker Road, Cortland, NY 13045
Anne_Secord@fws.gov

Your Name: Meredith Perreault, Executive Director Central New York Land Trust	**Street Address:**
City, State, Zip: Syracuse, NY 13290	**Phone and Email:**

Project Description: Briefly describe project, including objectives, and explain how the project would address potentially injured resources and/or losses to the public.

Title: Central New York Stewardship Collaborative
a. Purpose: An endowment intended to generate sufficient funds through interest to support a partnership network for integrated urban and rural environmental stewardship in the Onondaga Lake Watershed, led by a regional stewardship coordinator.
b. Goals: Increase CNY stewardship ethic, skills, and coordination, build capacity for future land management challenges, link agricultural and ecological land protection. Create urban and rural equity for public access and enjoyment of open space, parks, and preserves.
c. Objectives:
  i. Establish stewardship network through regular workshops as venues for education and collaboration;
  ii. Seed and leverage funds for active land management in existing protected areas, including:
    1. Increasing public enjoyment opportunities through connectivity and access projects;
    2. Improving habitat through invasive species control and restoration projects;
  iii. Support agricultural livelihoods by building local capacity/partnerships for farmland conservation easements, particularly farms subject to development pressure, contributing significantly to local food supply, or harboring headwaters or rare ecosystems.
  iv. Create grants program for specific stewardship projects undertaken by partnerships of local organizations, consisting of schools, youth groups, environmental organizations, urban/rural agriculture groups, and nonprofits, in cooperation with government agencies.
d. Benefits: Improved protection for protected species or sensitive or unique habitats, linkage to injured resources or associated services, habitat connectivity, increased public enjoyment and use of natural resources, long-term coordinated structure for land stewardship and invasive species control.

Project Description, continued: Will the restoration project accomplish any of the following (check all that apply):

i Enhance fish habitat and or fish species (e.g., dam removal, fish passage, stocking, spawning habitat, stream improvements).
i Enhance avian resources (e.g., nesting enhancement, species protection, habitat enhancement or protection).
X Enhance, restore, and protect wetland habitat.
i Enhance reptiles and amphibian habitat or increase reptile or amphibian populations.
X Provide invasive species control.
i Enhance or protect rare, threatened and endangered species or species of special concern.
i Enhance or restore terrestrial, aquatic, and/or semi-aquatic mammals or their habitat.
X Provide new or enhanced fishing/boating opportunities.
X Provide new or enhanced natural resource cultural or recreational activities
X Enhance natural resource education/outreach

X = Direct accomplishments of stewardship network; i = indirect benefits of greater collaboration, seed funds, and grant program.

Project Location and Cost: If you have a specific site in mind, briefly describe location; town/city and county; other identifying landmarks; historic conditions of site; potential cost (if known) and the landowner.

The Central New York Stewardship Network would operate in the Onondaga Lake watershed.

Cost estimates will require working with NRDAR Trustees to determine desired scope of this project.

Actions to date: If known, briefly describe any actions, studies, or funding commitments that have already been initiated for this project.

Note: This "Central New York Stewardship Collaborative" proposal is informed by an effort of the NRDA Trustee Council for Commencement Bay, Tacoma, WA.

Central New York Land Trust is proposing a series of stewardship workshops for its volunteers in the 2015 funding cycle of the New York State Conservation Partnership Program.

Participants/Contacts: If known, please identify agencies/organizations likely to participate in or are knowledgeable about the project.

Central New York Land Trust proposes this list with the caveat that consultation with Onondaga Lake NRDAR Trustees would be essential to determine the full complement of likely participants.

Likely to participate:
Regional land trusts and land care groups
Foundations
Environmental organizations, clubs & nonprofits
Outdoors and sportsmen's clubs
Schools, university students, and youth groups
Gardening/agriculture organizations

Governments:
NRDAR Trustees
Potential collaborations could be sought with regional planning agencies, City of Syracuse, Onondaga County, Onondaga County Towns, and New York state agencies and US Federal agencies

Restoration projects may recruit organizations who have or wish to acquire restoration skills.

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Riparian Habitat Acquisition Support

Onondaga Lake
Natural Resource Damage
Assessment and Restoration
Trustee Council

RESTORATION SUGGESTION FORM

ONONDAGA LAKE NATURAL RESOURCE DAMAGE ASSESSMENT

Background:

The Onondaga Nation, Department of the Interior Fish and Wildlife Service and New York State Department of Environmental Conservation are conducting a natural resource damage assessment at Onondaga Lake. We are in the process of identifying potential projects to restore, replace or compensate for injuries to and lost use of natural resources caused by hazardous substances released in and around Onondaga Lake. We invite you to submit suggestions for restoration projects. Please understand we are currently collecting ideas and suggestions, not funding grant proposals for work to be done by a specific group. Projects that meet these requirements will be evaluated based on:

- Connection to potentially injured resource (proximity, linkage to resources or resource services affected by hazardous substance releases)
- Likelihood of success
- Cost effectiveness
- Ability to produce demonstrable, quantifiable benefits
- Compatibility with Trustee resource management goals

More information about the Natural Resource Damage Assessment can be found at:
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Instructions:
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Anne Secord, USFWS
3817 Luker Road, Cortland, NY 13045
Anne_Secord@fws.gov

Your Name: Meredith Perreault, Executive Director Central New York Land Trust	**Street Address:**
City, State, Zip: Syracuse, NY 13290	**Phone and Email:**

Project Description: Briefly describe project, including objectives, and explain how the project would address potentially injured resources and/or losses to the public.

Title: Riparian Habitat Acquisition Support in Onondaga Lake Watershed

a. Purpose: Identification and acquisition of ecologically important riparian corridors and connected uplands, for restoration and/or protection.
b. Goals: Protect fragile riparian, aquatic and connected upland habitats; build capacity to manage fee simple and conservation easement land protection efforts, create preserves for "low-impact" public use.
c. Objectives:
   i. Conduct collaborative strategic planning for riparian protection (see proposal for CNY Stewardship Collaborative);
   ii. Prioritize protection adjacent to existing conservation areas;
   iii. Create or increase buffers between "high-impact" land uses and riparian and aquatic habitats;
   iv. Increase local expertise for using diverse mechanisms for land conservation.
d. Benefits: Linkage to injured resources and associated services, habitat connectivity, proximity to protected lands, benefits to protected species or sensitive or unique habitats.

Project Description, continued: Will the restoration project accomplish any of the following (check all that apply):

X Enhance fish habitat and or fish species (e.g., dam removal, fish passage, stocking, spawning habitat, stream improvements).

X Enhance avian resources (e.g., nesting enhancement, species protection, habitat enhancement or protection).

X Enhance, restore, and protect wetland habitat.

X Enhance reptiles and amphibian habitat or increase reptile or amphibian populations.

X Provide invasive species control.

X Enhance or protect rare, threatened and endangered species or species of special concern.

X Enhance or restore terrestrial, aquatic, and/or semi-aquatic mammals or their habitat.

X Provide new or enhanced fishing/boating opportunities.

X Provide new or enhanced natural resource cultural or recreational activities

___ Enhance natural resource education/outreach

Project Location and Cost: If you have a specific site in mind, briefly describe location; town/city and county; other identifying landmarks; historic conditions of site; potential cost (if known) and the landowner.

As far as CNY Land Trust is aware, thought has been put into potential acquisition sites in the Onondaga Creek, Ninemile Creek, Otisco Lake and Spafford Creek watersheds, however, potential acquisitions in Ley, Bloody Brook and Sawmill watersheds should be evaluated.

Cost estimates will require working with NRDAR Trustees to determine desired scope of this project.

Actions to date: If known, briefly describe any actions, studies, or funding commitments that have already been initiated for this project.

Note: This "Riparian Habitat Acquisitions Support" proposal is modeled on a similar effort by the Santa Clara River Trustee Council NRDAR Plan, Los Angeles and Ventura Counties, CA.

Central New York Land Trust owns 12 fee simple land trust preserves within the Onondaga Lake Watershed; other protected areas are owned by the City of Syracuse, New York State and Onondaga County and Town governments; as noted, ideally proposed acquisitions would build on this existing set of protected areas.

Planning efforts include Onondaga Lake Partnership's Onondaga Creek Conceptual Revitalization Plan; Syracuse-Onondaga County Planning Agency and New York State Department of Environmental Conservation have data available to help identify potential acquisitions, Ninemile Creek Conservation Council has undertaken watershed assessment efforts.

Participants/Contacts: If known, please identify agencies/organizations likely to participate in or are knowledgeable about the project.

Central New York Land Trust proposes this list with the caveat that consultation with Onondaga Lake NRDAR Trustees would be essential to determine the full complement of likely participants, and we have not yet consulted with the current list.

Likely to participate:
New York Agricultural Land Trust
Ninemile Creek Conservation Council
Onondaga Audubon Society
Onondaga County Federation of Sportsmens Clubs
Izaak Walton League, Central New York Chapter
Trout Unlimited, Iroquois Chapter

Governments:
NRDAR Trustees
Potential collaborations could be sought with regional planning agencies, City of Syracuse, Onondaga County, Onondaga County Towns, and New York state agencies and US Federal agencies

Restoration projects may recruit: Atlantic States Legal Foundation, Onondaga Earth Corps, Onondaga Lake Conservation Corps, and other organizations with restoration skill sets.

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Floatables Debris Collection/Oxygenation

Onondaga Lake
Natural Resource Damage Assessment and Restoration
Trustee Council

RESTORATION SUGGESTION FORM
ONONDAGA LAKE NATURAL RESOURCE DAMAGE ASSESSMENT

Background:

The Onondaga Nation, Department of the Interior Fish and Wildlife Service and New York State Department of Environmental Conservation are conducting a natural resource damage assessment at Onondaga Lake. We are in the process of identifying potential projects to restore, replace or compensate for injuries to and lost use of natural resources caused by hazardous substances released in and around Onondaga Lake. We invite you to submit suggestions for restoration projects. Please understand we are currently collecting ideas and suggestions, not funding grant proposals for work to be done by a specific group. Projects that meet these requirements will be evaluated based on:

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- Likelihood of success
- Cost effectiveness
- Ability to produce demonstrable, quantifiable benefits
- Compatibility with Trustee resource management goals

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Instructions:

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Anne Secord, USFWS
3817 Luker Road, Cortland, NY 13045
Anne_Secord@fws.gov

Your Name:	**Street Address:**
S	3 St.
	Phone and Email:

Project Description: Briefly describe project, including objectives, and explain how the project would address potentially injured resources and/or losses to the public.

well the information ive obtained on Onondaga Lake Says Oxygen levels are lovend in the Summer & aquatic plants are nessasary. I was thinking, to begin, About a fish tank aquarium & the airbubbles that are discharged into the water to refresh the water with oxygen levels, ONly if you used like P.S.C. Pipeing or somthing like it cheap & efficiantly aquiring it might do the trick, im not Albert Einstien, but he inspires me.

check additional paper:

Floating Classroom

Onondaga Lake
Natural Resource Damage
Assessment and Restoration
Trustee Council

RESTORATION SUGGESTION FORM
ONONDAGA LAKE NATURAL RESOURCE DAMAGE ASSESSMENT

Background:

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http://www.fws.gov/northeast/nyfo/ec/onondaga.htm

Instructions:
Please complete as many sections as possible. Your suggestion will be considered even if you are unable to fill out every section. If you need more space, please use additional paper and label appropriate sections. This form is also available on the web at: http://www.fws.gov/northeast/nyfo/ec/onondaga.htm. Send completed forms to:

Anne Secord, USFWS
3817 Luker Road, Cortland, NY 13045
Anne_Secord@fws.gov

Your Name: Onondaga Environmental Institute	
City, State, Zip: Syracuse, NY 13204	**Phone and Email:**

Project Description: Briefly describe project, including objectives, and explain how the project would address potentially injured resources and/or losses to the public.

This study proposes to develop, implement, and manage a floating classroom on Onondaga Lake. Both formal and informal educational experiences will be designed to accommodate an array of participants, including grade school, colleges, clubs and organizations, and the general public. Participants will explore issues concerning their lake and environmental factors that affect freshwater systems. Schools will monitor the progress of cleanup efforts in Onondaga Lake, fostering a sense of community stewardship and appreciation for this tremendous natural resource. Students will help implement research programs that will be designed to monitor and analyze the recovery of native plant and animal species. Current perceptions and misconceptions will be challenged through exciting learning experiences as involved youth gain a broader, more accurate understanding of the Onondaga Lake Watershed and its recovery.

Project Description, continued: Will the restoration project accomplish any of the following (check all that apply):

___ Enhance fish habitat and or fish species (e.g., dam removal, fish passage, stocking, spawning habitat, stream improvements).

___ Enhance avian resources (e.g., nesting enhancement, species protection, habitat enhancement or protection).

___ Enhance, restore, and protect wetland habitat.

___ Enhance reptiles and amphibian habitat or increase reptile or amphibian populations.

___ Provide invasive species control.

___ Enhance or protect rare, threatened and endangered species or species of special concern.

___ Enhance or restore terrestrial, aquatic, and/or semi-aquatic mammals or their habitat.

_X_ Provide new or enhanced fishing/boating opportunities.

_X_ Provide new or enhanced natural resource cultural or recreational activities.

_X_ Enhance natural resource education/outreach

Project Location and Cost: If you have a specific site in mind, briefly describe location; town/city and county; other identifying landmarks; historic conditions of site; potential cost (if known) and the landowner.
The Floating Classroom would consist of one passenger vessel (e.g., pontoon boat) and one research vessel (e.g., john boat); both of which would be docked at the Onondaga Lake Inner Harbor. Activities, lessons, and tours would be performed on these vessels. The classroom will provide first-hand experience to educate the students and the public about Onondaga Lake's water quality issues and restoration, including human-health advisories. Restrictions on swimming and eating fish from Onondaga Lake will be explained so that students know how to safely enjoy the lake. As Onondaga Lake is currently monitored by a number of agencies, students will learn water testing methods and be able to compare the data they collect with that of environmental professionals, thereby encouraging interest in environmental careers. The estimated cost for this project is $750,000, and will fund the development of education plans and support operations. The project duration is indefinite, and informal educational experiences (e.g., public tours, special events, etc.) will be designed to generate revenue (e.g., ticket sales, memberships, donations, etc) to maintain the program.

Actions to date: If known, briefly describe any actions, studies, or funding commitments that have already been initiated for this project.
OEI has performed extensive research for designing the floating classroom, including performing industry, financial, customer, and competitive analysis reviews of existing programs, as well as begun developing marketing, operating, and financial plans. The floating classroom would be part of the recently funded Water Research Education Center (WREC), through which OEI is a project partner and has secured funds for purchasing vessels and equipment.

Participants/Contacts: If known, please identify agencies/organizations likely to participate in or are knowledgeable about the project.
- Onondaga Environmental Institute
- SUNY-ESF
- LeMoyne College
- Upstate Freshwater Institute
- Cornell Biological Field Station
- USGS Tunison Aquatic Laboratory
- US Fish & Wildlife Services
- NYS Department of Environmental Conservation
- US Environmental Protection Agency

PLEASE NOTE: THIS IS NOT A REQUEST FOR PROPOSALS. CONSIDERATON OR SELECTION OF A PROJECT DOES NOT IMPLY THAT THE GROUP SUGGESTING THE PROJECT WILL BE CHOSEN FOR PROJECT IMPLEMENTATION. THANK YOU FOR YOUR TIME AND IDEAS!

Fish Passage Restoration Prioritization

Onondaga Lake
Natural Resource Damage Assessment and Restoration
Trustee Council

RESTORATION SUGGESTION FORM
ONONDAGA LAKE NATURAL RESOURCE DAMAGE ASSESSMENT

Background:

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- Likelihood of success
- Cost effectiveness
- Ability to produce demonstrable, quantifiable benefits
- Compatibility with Trustee resource management goals

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http://www.fws.gov/northeast/nyfo/ec/onondaga.htm

Instructions:
Please complete as many sections as possible. Your suggestion will be considered even if you are unable to fill out every section. If you need more space, please use additional paper and label appropriate sections. This form is also available on the web at: http://www.fws.gov/northeast/nyfo/ec/onondaga.htm. Send completed forms to:

Anne Secord, USFWS
3817 Luker Road, Cortland, NY 13045
Anne_Secord@fws.gov

Your Name:	**Street Address:** The Nature Conservancy 1048 University Ave
City, State, Zip:	**Phone and Email:**

Project Description: Briefly describe project, including objectives, and explain how the project would address potentially injured resources and/or losses to the public.

Barriers exist at the scale of the road-stream crossing (e.g., inappropriately sized culverts) on up to major dams on the downstream system which limit passage through the Onondaga Lake system. Many site specific projects have already been identified in the various restoration plans for Onondaga Lake and its watershed; we propose to help identify the most important places to prioritize fish passage restoration using a combination of desktop models and field based data collection.

Project Description, continued: Will the restoration project accomplish any of the following (check all that apply):

___ Enhance fish habitat and or fish species (e.g., dam removal, fish passage, stocking, spawning habitat, stream improvements).
___ Enhance avian resources (e.g., nesting enhancement, species protection, habitat enhancement or protection).
___ Enhance, restore, and protect wetland habitat.
___ Enhance reptiles and amphibian habitat or increase reptile or amphibian populations.
___ Provide invasive species control.
___ Enhance or protect rare, threatened and endangered species or species of special concern.
___ Enhance or restore terrestrial, aquatic, and/or semi-aquatic mammals or their habitat.
___ Provide new or enhanced fishing/boating opportunities.
___ Provide new or enhanced natural resource cultural or recreational activities
___ Enhance natural resource education/outreach

Project Location and Cost: If you have a specific site in mind, briefly describe location; town/city and county; other identifying landmarks; historic conditions of site; potential cost (if known) and the landowner.

Actions to date: If known, briefly describe any actions, studies, or funding commitments that have already been initiated for this project.

Participants/Contacts: If known, please identify agencies/organizations likely to participate in or are knowledgeable about the project.

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In-Lake Habitat Structures (Ringler, Bassmasters, Kirby)

Onondaga Lake
Natural Resource Damage
Assessment and Restoration
Trustee Council

RESTORATION SUGGESTION FORM

ONONDAGA LAKE NATURAL RESOURCE DAMAGE ASSESSMENT

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Anne Secord, USFWS
3817 Luker Road, Cortland, NY 13045
Anne_Secord@fws.gov

Your Name:	**Street Address:**
City, State, Zip:	**Phone and Email:**

Project Description: Briefly describe project, including objectives, and explain how the project would address potentially injured resources and/or losses to the public.

We propose that installation of fish habitat structures (i.e. rock piles, porcupine cribs) in Onondaga Lake outside of current remediation areas would provide substantial benefits to the warm and cool water fish communities that are currently present in the lake. The objectives would be to provide additional complex structure in key areas with the intent of increasing desirable sport-fish and food fish species as well as angling opportunities. The project would address past loss of habitat due to industrial discharges, loss of aquatic vegetation and alteration of sediment. It would also address years of lost angling opportunities in the lake. The benefits would be assessed based on fish and fish feed (invertebrates) associated with the structures using underwater cameras, nets and traps. The additional proposed resources would also be translated into recreation benefits.

Project Description, continued: Will the restoration project accomplish any of the following (check all that apply):

- [x] Enhance fish habitat and or fish species (e.g., dam removal, fish passage, stocking, spawning habitat, stream improvements).
- [ ] Enhance avian resources (e.g., nesting enhancement, species protection, habitat enhancement or protection).
- [x] Enhance, restore, and protect wetland habitat.
- [x] Enhance reptiles and amphibian habitat or increase reptile or amphibian populations.
- [ ] Provide invasive species control.
- [x] Enhance or protect rare, threatened and endangered species or species of special concern.
- [ ] Enhance or restore terrestrial, aquatic, and/or semi-aquatic mammals or their habitat.
- [x] Provide new or enhanced fishing/boating opportunities.
- [x] Provide new or enhanced natural resource cultural or recreational activities
- [x] Enhance natural resource education/outreach

Project Location and Cost: If you have a specific site in mind, briefly describe location; town/city and county; other identifying landmarks; historic conditions of site; potential cost (if known) and the landowner.

Sites will be picked around the lake based on areas that have the greatest potential for enhancement as well as ease of placement of the structures. Cost would be a modeled as a pilot study planned for 2015 and 2016 to work out beneftis with regard to fish and invertebrates.

Actions to date: If known, briefly describe any actions, studies, or funding commitments that have already been initiated for this project.

In conjunction with Honeywell Corp, Anchor QEA, and Parsons studies related to the project have been conducted for many years. New work anticipating this project is currently in planning stages.

Participants/Contacts: If known, please identify agencies/organizations likely to participate in or are knowledgeable about the project.

Mark Arrigo - Parsons
John McCullif - Honeywell Corp
Margaret Murphy - Anchor QEA

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Onondaga Lake
Natural Resource Damage
Assessment and Restoration
Trustee Council

RESTORATION SUGGESTION FORM

ONONDAGA LAKE NATURAL RESOURCE DAMAGE ASSESSMENT

Background:

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Anne Secord, USFWS
3817 Luker Road, Cortland, NY 13045
Anne_Secord@fws.gov

Your Name: Salt City Bassmasters President: Tom Pavlot	**Street Address:**
City, State, Zip: Utica, N.Y. 13502	**Phone and Email:**

Project Description: Briefly describe project, including objectives, and explain how the project would address potentially injured resources and/or losses to the public.

After the dredging and capping process is complete the new bottom will be virtually sterile. Salt City Bassmasters would like to suggest ideas that would propogate the smallmout bass population by creating known favorable habitat. Salt City Bassmasters knows from experience smallmouth bass favor specific habitat for spawning and territorial habitat. Smallmouth favor broken rocks and gravel for spawning. Not round rocks. Boulders and large rock piles are used for protection from the sun and fisherman. These structures should be placed 2 feet deep to 20 feet deep. Specific aquatic vegetation like Chara, Cabbage Leaf, Curly Leaf Pond Weed should be placed between these structures so the Smallmouth have a pathway of cover. As a benefit of these suggestions, other fish species will use the Habitat and promote a healthy fish population. In return these suggestions will adventageous to the public as a sustainable healthy fishery.

Project Description, continued: Will the restoration project accomplish any of the following (check all that apply):

__X__ Enhance fish habitat and or fish species (e.g., dam removal, fish passage, stocking, spawning habitat, stream improvements).
___ Enhance avian resources (e.g., nesting enhancement, species protection, habitat enhancement or protection).
__X__ Enhance, restore, and protect wetland habitat.
__X__ Enhance reptiles and amphibian habitat or increase reptile or amphibian populations.
___ Provide invasive species control.
__X__ Enhance or protect rare, threatened and endangered species or species of special concern.
__X__ Enhance or restore terrestrial, aquatic, and/or semi-aquatic mammals or their habitat.
__X__ Provide new or enhanced fishing/boating opportunities.
__X__ Provide new or enhanced natural resource cultural or recreational activities
__X__ Enhance natural resource education/outreach

Project Location and Cost: If you have a specific site in mind, briefly describe location; town/city and county; other identifying landmarks; historic conditions of site; potential cost (if known) and the landowner.

Onondaga Lake

Actions to date: If known, briefly describe any actions, studies, or funding commitments that have already been initiated for this project.

Participants/Contacts: If known, please identify agencies/organizations likely to participate in or are knowledgeable about the project.

Salt City Bassmasters, Syracuse, NY

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Onondaga Lake
Natural Resource Damage
Assessment and Restoration
Trustee Council

RESTORATION SUGGESTION FORM

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Anne Secord, USFWS
3817 Luker Road, Cortland, NY 13045
Anne_Secord@fws.gov

Your Name: Dr. Lucas Kirby, SUNY-ESF	**Street Address:**
City, State, Zip: Syracuse, NY, 13224	**Phone and Email:**

Project Description: Briefly describe project, including objectives, and explain how the project would address potentially injured resources and/or losses to the public.

The main objective of this project is to increase diversity of aquatic macroinvertebrates and restore populations of species that were extirpated from Onondaga Lake during the past century. The aquatic macroinvertebrate community continues to have low species richness and is dominated by pollution tolerant taxa. This community has received limited interest even though they are vital components to the aquatic and riparian foodweb. This project will have two components: 1) The addition of medium size angular stone to the shallow (0-0.5 m) littoral zone in areas with moderate wave energy. This area will provide habitat for various aquatic macroinvertebrates that are currently not found in the lake. 2) The reintroduction of extirpated species (to restored areas) that are currently found in the Onondaga Lake outlet and have limited colonization potential. In the Onondaga Lake outlet we have documented four large snail species that historically were found in the lake, and a mayfly (Heptageniidae) that would be targeted for stocking. Mayflies have been identified as a target group, but there are currently no proposals that would specifically promote their establishment. This large substrate would also be used by spawning bass.

Project Description, continued: Will the restoration project accomplish any of the following (check all that apply):

- x Enhance fish habitat and or fish species (e.g., dam removal, fish passage, stocking, spawning habitat, stream improvements).
- x Enhance avian resources (e.g., nesting enhancement, species protection, habitat enhancement or protection).
- ___ Enhance, restore, and protect wetland habitat.
- ___ Enhance reptiles and amphibian habitat or increase reptile or amphibian populations.
- ___ Provide invasive species control.
- x Enhance or protect rare, threatened and endangered species or species of special concern.
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- ___ Provide new or enhanced fishing/boating opportunities.
- ___ Provide new or enhanced natural resource cultural or recreational activities
- ___ Enhance natural resource education/outreach

Project Location and Cost: If you have a specific site in mind, briefly describe location; town/city and county; other identifying landmarks; historic conditions of site; potential cost (if known) and the landowner.

I propose the addition of medium sized angular stones to the littoral (0 - 0.5 m depth) zone in areas with moderate wave energy in Onondaga Lake (Eastern shore, possibly north of Nine Mile Creek). Each area that receives stones should be a minimum of 100 m in shoreline length and 2 meters wide to promote natural colonization.

Select species of aquatic macroinvertebrates would be collected in the Onondaga Lake outlet and stocked into the restored area after algae was established (~1 month).

Estimated total cost for this project would be ~$25,000.

Actions to date: If known, briefly describe any actions, studies, or funding commitments that have already been initiated for this project.

Neil Ringler's Lab has worked on Onondaga Lake since 1989. We have documented extensive biological recovery because of restoration efforts. One group of organisms that have not recovered are the benthic and epiphytic macroinverterbates. Stephanie Johnson (OEI) documented a pollution tolerant benthic macroinverterbate community in 2009. In 2011 and 2012, I studied the epiphytic communities of aquatic macroinvertebrates in Onondaga Lake, Onondaga Lake outlet, Oneida Lake, and Otisco Lake. Onondaga Lake was found to have low taxa richness and was dominated by pollution tolerant taxa. In 2014, I collected snails and mayflies from 20 sites within the Onondaga Lake outlet to extensively document species richness and distribution. This summer I am investigating the survival and growth of extirpated snail species in a controlled introduction to conditions in Onondaga Lake.

Participants/Contacts: If known, please identify agencies/organizations likely to participate in or are knowledgeable about the project.

SUNY ESF and the Onondaga Environmental Institute will be partners in this project.
Parsons would likely be a partner in the distribution of substrate into Onondaga Lake.

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Water Research Center

Onondaga Lake
Natural Resource Damage
Assessment and Restoration
Trustee Council

RESTORATION SUGGESTION FORM

ONONDAGA LAKE NATURAL RESOURCE DAMAGE ASSESSMENT

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htt ://www.fws. ov/northeast/n fo/ec/ononda a.htm

Instructions:

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Annie Secord, USFWS
3817 Luker Road, Cortland, NY 13045
Anne_Secord@fws.gov

Your Name:	
City, State, Zip:	

Project Description: Briefly describe project, including objectives, and explain how the project would address potentially injured resources and/or losses to the public:

The Project Description is attached as EXHIBIT A

Project Description, continued: Will the restoration project accomplish any of the following (check all that apply):

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x Provide new or enhanced fishing/boating opportunities.
x Provide new or enhanced natural resource cultural or recreational activities
x Enhance natural resource education/outreach

NOTE: The increased research conducted through the SUNY Water Research and Education Center would likely enhance all the project areas.

Project Location and Cost: If you have a specific site in mind, briefly describe location; town/city and county; other identifying landmarks; historic conditions of site; potential cost (if known) and the landowner.

SUNY Water Research and Education Center
Inner Harbor
Syracuse, New York

Requested Operating Assistance: $1M over 5 years.
NOTE: To be matched by Federal and State Grants over the 5 year period.

Actions to date: If known, briefly describe any actions, studies, or funding commitments that have already been initiated for this project.

Estimated Capital Cost: $20M (NYSUNY 2020 Construction Grant Secured in the amount of $20M)

EYP, Inc. has been retained by COR Development Company, LLC, and has largely completed the conceptual design.

The preliminary conceptual design package is attached as EXHIBIT B.

Participants/Contacts: If known, please identify agencies/organizations likely to participate in or are knowledgeable about the project.

SUNY College of Environmental Science and Forestry
Onondaga Community College
Upstate Freshwater Institute
Onondaga Environmental Institute
COR Development Company, Inc.

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Exhibit A

Center Activities to Monitor and Improve the Terrestrial and Aquatic Ecosystem of Onondaga Lake

The 50 faculty and 2,500 students at the Center will focus on the enhancement of fish habitat and fish species through applied research, service learning, and field experiences. The students studying fisheries science will take on at least one project every year associated with improving the fisheries of Onondaga Lake. Most of the recent monitoring of the improvement of the fish populations of Onondaga have been conducted by both undergraduate and graduate students enrolled in the SUNY College of Environmental Science and Forestry.

The Center will also address the issue of the control of aquatic invasive species such as the zebra mussel, round goby, and the future threat of Asian carp also through applied research, service learning, and field projects. The Center will offer the opportunity to get a broader population of students under the leadership of Dr. Neil Ringler.

There are significant issues along the shoreline of Onondaga Lake associated with invasive terrestrial vegetation. Significant efforts were undertaken during the remediation to replant disturbed areas of the shoreline of Onondaga Lake. The identification of appropriate native populations and the planting plan was directed by Dr. Don Leopold.

The Center will continue to engage undergraduate students, graduate students and the general population in the continued eradication of terrestrial invasive species and replanting of native species along the shoreline of Onondaga Lake. At least one project will be taken on during each year.

Dr. Richard Smardon, over the last 3 years, has designed and constructed wetlands in the Onondaga Lake basin. The wetland has been designed and constructed in the Harbor Brook watershed to assist in the treatment of stormwater and combined sewer overflows.

With Dr. Smardon's engagement the Center, together with its undergraduate and graduate students, will either enhance an existing wetland or create a wetland within the Onondaga Lake watershed on an annual basin.

The activities of faculty and students through the SUNY Water Research and Education Center will continue to monitor and help improve the quality of Onondaga Lake long after the sediment remediation and upgrade to the Syracuse Metropolitan Sewage Treatment Plant have been completed.

Innovative ideas incorporated into the Center include: real-time monitoring of the improving water quality of Onondaga Lake; a remotely operated submersible vehicle; and tie into real-time monitoring data from lakes and oceans around the world.

SUNY Water Research and Education Center at Onondaga Lake

The State University of New York in collaboration with Governor Andrew Cuomo awarded a $20 million grant in the fall of 2014 to the SUNY College of Environmental Science and Forestry (ESF) to design and build the *SUNY Water Research and Education Center at Onondaga Lake* at the Inner Harbor in Syracuse, New York. The Center represents a collaboration between ESF, Onondaga Community College, the Upstate Freshwater Institute, the Onondaga Environmental Institute, the Museum of Science and Technology, the Onondaga Historical Association, the Great Lakes Research Consortium, and COR. The Mission of the Center is to *Harness NYS Academic Power to Support the Economy and Improve the Environment*.

The founding purpose of the Center is as follows:

- New Lake-Focused Education Programs
  - A floating classroom
  - An aquarium
  - Expanded Syracuse City School programming
- A New Wave of Research
- An Education Anchor for Syracuse's Inner Harbor Development
- Contribute to the Regional Economic Development Vision
- Help Advance the SUNY Strategic Plan
- Provide Economic Impact
- Provide Access to Academic Excellence and Student Success
- Stimulate Collaboration
- Celebrate the importance of the history of Native Americans and Onondaga Lake

It is expected that the SUNY Water Research and Education Center will provide the following local stimulus:

- $25M increase in sponsored research
- Sponsor new academic programs
- Support 50 faculty and research investigators
- Serve 2,500 students
- Support and educate 20,000 visitors
- Host 20 research seminars and conferences
- Contribute $10M to the local economy

ESF has twenty-three faculty that have been involved in conducting research associated with Onondaga Lake. Onondaga Community College has identified five faculty that are interested in participating in the Center. The Upstate Freshwater Institute have identified nine research scientists and engineers that are expected to use the facility along with seven research and administrative staff for the Onondaga Environmental Institute.

Gere Lock

Onondaga Lake
Natural Resource Damage Assessment and Restoration
Trustee Council

RESTORATION SUGGESTION FORM
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Instructions:

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Anne Secord, USFWS
3817 Luker Road, Cortland, NY 13045
Anne_Secord@fws.gov

Your Name: Elisabeth and David Beebe
town of Camillus - Erie Canal Park
Camillus Parks & Recreation

Street

City, State, Zip:

Project Description: Briefly describe project, including objectives, and explain how the project would address potentially injured resources and/or losses to the public.

Project Description –To connect the canalway trail from Route173 to Onondaga Lake and Syracuse and the Restoration of Gere's Lock, located at the corner of Horan Road and Gere Lock Roads, Camillus, New York. A suggested solution to a critical problem!

1. We suggest that the canalway trail continue from the eastern end of the Camillus Canal Park, pass through Reed Webster Park, run by the Honeywell waste bed on an existing suitable road, exiting onto Gere Lock Road and continuing on the towpath along side Gere's Lock to Bridge Street where the bike trail could turn left to the Onondaga Lake trail or to the right to Milton Avenue and Erie Blvd. West to Syracuse. See enclosed map.
2. Restore Historic Gere's Lock = please see enclosed letter of Jan. 02, 2015.

Project Description, continued: Will the restoration project accomplish any of the following (check all that apply):

- ✓ Enhance fish habitat and or fish species (e.g., dam removal, fish passage, stocking, spawning habitat, stream improvements). Fish Ladder under Gere Lock Road - Geddes Brook flows under Gere's Lock
- ✓ Enhance avian resources (e.g., nesting enhancement, species protection, habitat enhancement or protection).
- ✓ Enhance, restore, and protect wetland habitat.
- ✓ Enhance reptiles and amphibian habitat or increase reptile or amphibian populations.
- ✓ Provide invasive species control.
- ___ Enhance or protect rare, threatened and endangered species or species of special concern.
- ___ Enhance or restore terrestrial, aquatic, and/or semi-aquatic mammals or their habitat.
- ___ Provide new or enhanced fishing/boating opportunities.
- ✓ Provide new or enhanced natural resource cultural or recreational activities
- ✓ Enhance natural resource education/outreach Field trips - Camillus Canal Society - Bus tours - 2000 School Children May - June - Boat rides & lectures -

Project Location and Cost: If you have a specific site in mind, briefly describe location; town/city and county; other identifying landmarks; historic conditions of site; potential cost (if known) and the landowner.

Gere's Lock -owned by Honeywell, leased by the Camillus Erie Canal Park for over 40 years
Corner of Horan and Gere Lock Road, Town of Camillus. Lock site stabilized and ready for immediate restoration.
Re: Parking lot at Gere's lock filled in by Allied Chemical-water must be tested west of lock to determine if it presents a hazard

Actions to Date: Maintained by the Camillus Erie Canal Park Volunteers –To preserve the lock gates from further deterioration they were removed and are exhibited behind Sims' Museum. Please see the chapter pertaining to Gere's Lock in the enclosed book. The overflow pit is now covered with protective doors leading to a rare 220-foot water exit tunnel. Gere's lock , gateway to the west, was the first lift lock constructed for the First Enlargement and the first to be doubled in length. Allied Chemical pushed the top three layers of limestone blocks into the prism to prevent people falling into the canal bed. The blocks can be removed and replaced on a strong foundation. Gere Lock road is closed and a fish ladder is adjacent to the Lock. We must continue to place water into the lock to prevent deterioration of the foundation. This will create a great marine environment for birds, mammals and invertebrates.

Participants/Contacts: If known, please identify agencies/organizations likely to participate in or are knowledgeable about the project.

2

Acquire Public Fishing Rights

RESTORATION SUGGESTION FORM
ONONDAGA LAKE NATURAL RESOURCE DAMAGE ASSESSMENT

Your Name: Les Monostory, Izaak Walton League Central New York Chapter, and board member, Onondaga County Federation of Sportsmen's Clubs
Street Address:
City, State, Zip:
Phone and Email:
Project Description:

Onondaga Creek has a long history of stream water contamination from two principal sources, (a) leakage of brine solution from wooden pipe lines that supplied brine from salt wells in the Tully Valley to the Allied Chemical soda ash plant in the Village of Solvay, and (b) discharge of chlorides and mud sediments high in clay content into Onondaga Creek from the Tully Valley "mud boils".

Measures to control the sources of contamination were developed as part of the Onondaga Lake Cleanup under the US and NY State "Superfund", with the Honeywell Corporation as the responsible party. Those measures were initially fairly successful in controlling contaminants, but new problems of a similar nature developed due to natural causes that have caused further setbacks in the improvement of the Creek. New solutions to the recently developed problems are under consideration at this time.

In the meantime, this proposal is to acquire public fishing rights ("PFR") along sections of Onondaga Creek and its major tributaries. The acquisitions would result partly from the transfer of lands presently owned by Honeywell and would provide public access to the stream resource. The purpose of the acquisitions would be to make the community aware of the existing resource, and the potential for continued significant future enhancement of it. The desired result is more community use and appreciation of this historically high value fishery within the Onondaga Creek basin, the larger of Onondaga Lake's two principal tributaries.

History of Solution Mining of Brine from the Tully Valley Rock Salt Beds
According to the Upstate Freshwater Institute report, "Limnological and Engineering Analysis of a Polluted Urban Lake" (Steven W. Effler, editor, 1996), the Solvay Process Company began solution mining of the Tully Valley salt beds in 1889, and subsequently the Allied Chemical Company continued those brine solution mining operations until 1986. The liquid brine solutions mined from the underground rock salt formations were then transported by gravity feed through a wooden pipeline that extended from the upper Onondaga Creek valley approximately 20 miles to a brine reservoir located near Milton Avenue in the Village of Solvay. The brine solution was an integral part of the soda ash manufacturing conducted for nearly a century by the Solvay Process and Allied Chemical Companies.

Periodic breaks or ruptures in the wooden pipes that supplied brine solutions from the Tully Valley salt beds to the Allied Chemical soda ash plant in Solvay have reportedly caused historic fish kills in Onondaga Creek, according to newspaper accounts and a draft report prepared by the Onondaga Environmental Institute in 2009. The "Onondaga Creek Conceptual Revitalization Plan" report includes a timeline of flooding and waste treatment developments along Onondaga Creek between 1900 and 2005. According to this report, between 1948 to 1985 over eighty Allied brine pipeline breaks or spills were recorded that leaked concentrated brine solutions into Onondaga Creek. Allied closed down its soda ash manufacturing plant in Solvay in 1986.

Discharges to Onondaga Creek from the Tully Valley "Mud Boils"

The occurrence of mud boils in the Tully Valley between Otisco Valley Road and Tully Farms Road has been documented as a continual source of mud and silt entering Onondaga Creek since the late 1890's (Steven W. Effler, ed., 1996). These inputs seem to increase during periods of heavy rain, and the mud discharges can have a significant impact on the water quality of Onondaga Creek.

Effler and others measured suspended solids concentrations in 1992 in an established mud boil tributary to Onondaga Creek, and in the Creek bed above and below the mud boil tributary input. Suspended solids concentrations ranged from 760-871 mg/l in the mud boil tributary. Concentrations in Onondaga Creek just above the mud boil input ranged from 15.9-18.5 mg/l and below the mud boil input concentrations of suspended solids increased substantially, ranging from 102-114 mg/l.

The Tully Valley mud boils and volcanoes produce a tannish-colored turbid stream flow that subsequently enters Onondaga Creek and completely mixes with the stream flow. The mud boil turbidity can be clearly observed in stream flow for several kilometers downstream from the principal mud boils under low flow conditions, and down to the mouth of Onondaga Creek during runoff events (Steven W. Effler, ed., 1996).

Brown Trout Communities in Onondaga Creek

Fish communities in Onondaga Creek were studied in 1991 at fifteen sites along Onondaga Creek and its principal tributaries. Brown trout, white sucker, creek chub, slimy sculpin and blacknose and longnose dace were the major components of the fish communities collected at all sites. Table 6.47 in the "Limnological and Engineering Analysis" report contains information on the fish density and maximum size of the brown trout collected along six sites in Onondaga Creek between Dorwin Avenue in Syracuse and the Creek headwaters above Woodmancy Road in the Town of Tully.

Webster Road crosses Onondaga Creek approximately halfway between Dorwin Avenue on the south side of Syracuse and the Creek headwaters above Woodmancy Road. The 1991 study of fish communities in Onondaga Creek indicates that natural reproduction of brown trout was observed throughout the entire Onondaga Creek valley, despite the turbid stream flows originating from the Tully "mud boils". Brown trout are a popular game fish with trout anglers, and sections of Onondaga Creek have been periodically stocked with trout from Onondaga County's Carpenter's Brook Fish Hatchery.

Brown trout densities were found to be lowest in the northern sections of Onondaga Creek between Dorwin Avenue and Webster Road. Trout densities were somewhat higher in the mid-valley section between Webster Road and the Tully "mud boils" area, while the highest brown trout densities were found in the southern headwater sections of Onondaga Creek, between the Tully "mud boils" and Woodmancy Road.

The 1991 fish community study included surveys of fish communities in the Rattlesnake Gulf and Kennedy Creek tributaries, but did not include any fish surveys in the West Branch of Onondaga Creek that extends from the vicinity of the Onondaga Nation westward towards the Village of Marcellus. The West Branch of Onondaga Creek is a principal tributary that has an established community of native

brown and brook trout, and is not directly influenced by turbid waters from the Tully "mud boils", or by historic brine pipeline leaks.

Onondaga Creek has been stocked annually with brown trout from the County's Carpenter's Brook Fish Hatchery since at least 1987 at several road intersections between NYS Route 20 and Route 11A or Tully Farms Road in the Town of Tully. Brown trout have also been stocked annually in the West Branch of Onondaga Creek. However, there are no state-acquired Public Fishing Rights lands along any stretch of either Onondaga Creek or any of its tributaries.

Stream Sections in Onondaga County with Designated NYSDEC Public Fishing Rights

The NYS Department of Environmental Conservation, and its predecessor, the NYS Conservation Department, have purchased numerous miles of public fishing rights across New York State since the mid-1930's. During that time, more than 1,300 miles of public fishing rights (PFR) easements have been purchased on more than 400 streams across New York State. Fishing rights also allow the public to park in designated parking areas and to access the stream via marked footpaths.

Within the County of Onondaga, the Department has purchased over 16 miles of PFR easements along six stream segments, nearly half of which are located along Butternut Creek in the east central portion of the County. Anglers can look up maps of the PFR stream segments on the NYSDEC web page (www.dec.gov/outdoor/7746.html). A list of the available PFR sections along the six streams in Onondaga County is presented below:

Stream	No. of PFR Stream Sections	No. of DEC Angler Parking Areas	Total Length of designated PFR's
Butternut Creek	12	8	8.1 miles
Carpenter's Brook	1	1	0.8 miles
Fabius Brook	4	0	1.4 miles
Limestone Creek	5	0	1.6 miles
Ninemile Creek	8	5	4.3 miles
Shotwell Brook	1	0	0.01 miles
Onondaga Creek	0	0	0 miles

Lack of Public Fishing Rights along Onondaga Creek

Although Onondaga Creek is one of the two largest tributaries to Onondaga Lake, and supports a naturally reproducing population of brown trout, the NYS Department of Environmental Conservation has never purchased any public fishing rights (PFR's) along this major tributary of Onondaga Lake, nor has it purchased PFR's along any of the Onondaga Creek tributaries, including the West Branch.

Despite the adverse effects of periodic brine pipeline leaks and high levels of turbidity entering the Creek, trout populations in Onondaga Creek have nevertheless proved to be resilient over the years, thanks largely to the inflow of high quality waters from its numerous smaller tributaries.

Recommendations for NRDA Based Remediation

Purchase of Additional Public Fishing Rights along Onondaga Creek

Onondaga Creek and its principal West Branch tributary offer a major potential source of additional trout fishing opportunities for recreational anglers from Onondaga and neighboring counties. The Creek was historically a primary source of trout, salmon, and other fish species for native residents of the Onondaga Nation as well. The existing Onondaga Nation Reservation is located along the main branch of Onondaga Creek, and is also directly connected to Kennedy Creek and the West Branch of Onondaga Creek. This substantial trout fishing resource has been underutilized for decades due to limited public access to the Creek and its tributaries.

The NYS Department of Environmental Conservation has purchased over 8 miles of Public Fishing Rights along Butternut Creek since the 1940's, as well as 4.3 miles of Public Fishing Rights along Ninemile Creek. Missing from the DEC acquisitions is the considerable mileage of stream sections along Onondaga Creek (approximately 30 miles from Onondaga Lake to the Creek headwaters) that offer great opportunities for future purchases of PFR's in order to enhance existing trout fishing opportunities for recreational anglers. Purchase of additional PFR's for recreational fishing can generate enhanced fishing and travel related expenditures, and the resulting economic benefits for the County of Onondaga.

A few years ago, based on recommendations from the Onondaga County Federation of Sportsmen's Clubs, Honeywell opened a parking area for public fishing on Tully Farms Road where Onondaga Creek flows through the former Allied salt mining lands. However, presently there are still no State purchased PFR easements or public parking areas located along Onondaga Creek or any of its tributaries.

NRDA Project Objectives for Onondaga Creek

The principal objective of this project is to provide for the purchase of public fishing rights along the main stem and principal tributaries of Onondaga Creek upstream from the Syracuse City boundary (Dorwin Avenue), to the stream headwaters near Woodmancy Road in the Town of Tully. The project is intended to provide recreational anglers in Onondaga and neighboring counties with the same opportunities for public fishing access that have been provided by the NYSDEC for other significant trout waters in Onondaga County such as Butternut Creek, Ninemile Creek, and Limestone Creek.

Additional objectives and potential results from this project could include:

- Provide new or significantly enhanced opportunities for brook, rainbow and brown trout fishing
- Enhanced public awareness of threatened and endangered species, such as brook trout, and the previous history of Atlantic salmon, whitefish, and American eel populations in Onondaga Creek
- Restoration of trout and salmon populations on the lands of the Onondaga Nation, the community most directly affected by water quality degradation upstream from the Onondaga reservation. Nation elders have described widespread use of Onondaga Creek in previous years for fishing, swimming, and other community activities
- Enhanced public awareness and interest in restoring aquatic mammals such as mink and otter
- Enhance natural resource education and outreach by providing improved public access to the Onondaga Creek riparian areas for recreational anglers and other outdoor interested citizens.
- Continued stocking of trout in Onondaga Creek and its tributaries by Onondaga County's Carpenter's Brook Fish Hatchery.

Potential Future Enhancements to Onondaga Creek

The principal source of diminished water quality affecting the upper and middle sections of Onondaga Creek is the continued discharges of mud and silt sediments and the high level of chlorides originating from the Tully "mud boils". Mud and silt discharges can reduce the spawning success of trout and other fish species, while high levels of chlorides can result in reduced populations of aquatic insects and macroinvertebrates that are a principal source of food for the trout.

The Onondaga Lake Partnership has allocated significant funds over the past two decades to the US Geological Survey and other research organizations in order to find solutions that helped to significantly reduce "mud boil" discharges into Onondaga Creek. However, the effectiveness of those control measures has been reduced in recent years due to a tendency of the mud boils to "wander" from one location to another.

The current Onondaga Lake Watershed Partnership is in the process of appointing an "expert panel" with the goal of developing new and improved solutions to limiting the "mud boil" discharges. While the physical process of controlling these discharges into Onondaga Creek is an ongoing problem, there is new hope that future control measures will lead to an improved measure of water quality in Onondaga Creek that can help restore the full potential of the stream's native brown and brook trout populations.

Onondaga County's Established Fishing Constituency

Recreational fishing in New York State is reported to be a $2 billion annual industry, and the fishing related expenditures by anglers in Onondaga County may exceed $40 million per year, based on information gathered by the County appointed Fisheries Advisory Board. Fishing license sales in Onondaga County generally exceed 30,000 annually, with additional income generated by bass fishing clubs and out of county anglers visiting lakes and streams in our County and across Central New York.

Onondaga County operates the Carpenter's Brook Fish Hatchery, one of only two county run fish hatcheries in New York State, producing over 80,000 brown, brook, and rainbow trout annually for stocking in streams and lakes across the county. The NYSDEC operates a major walleye hatchery in Oswego County just north of Oneida Lake that provides an additional source of a popular game fish for stocking in Oneida and other area lakes, including Onondaga County's Otisco and Cross Lakes.

Onondaga County's Federation of Sportsmens Clubs includes some 40 fish and game clubs with a membership totaling over 5,000. Member clubs focused primarily on fishing include the Oneida Lake Association, Salt City Bassmasters, Iroquois Chapter of Trout Unlimited, the Anglers Association of Onondaga (the nation's oldest continuously operating fishing club), and the CNY Chapter of the Izaak Walton League of America. The angling constituency from these member clubs wishes to have greater access to trout fishing in Onondaga Creek, both in its present condition and in an enhanced future state.

Project Description, continued: Will the restoration project accomplish any of the following (check all that apply):

X_ Enhance fish habitat and or fish species (e.g., dam removal, fish passage, stocking, spawning habitat, stream improvements).
X _ Enhance, restore, and protect wetland habitat.
X_ Enhance or protect rare, threatened and endangered species or species of special concern.
X _ Enhance or restore terrestrial, aquatic, and/or semi-aquatic mammals or their habitat.

X_ Provide new or enhanced fishing/boating opportunities.
X_ Provide new or enhanced natural resource cultural or recreational activities
X_ Enhance natural resource education/outreach

Project Location and Cost:
The project location is the Onondaga Creek valley from the Onondaga Nation Reservation south to the Creek headwaters near Solvay Road, and along the adjacent West Branch and Fall Creek (Rattlesnake Gulf) tributaries of Onondaga Creek.

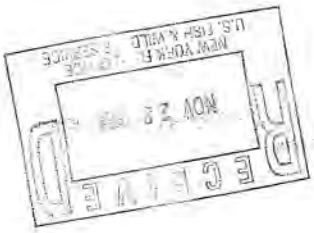
Targeted areas for public access to recreational fishing could potentially include up to 3 miles of Public Fishing Rights (PFR's) along the main stem of Onondaga Creek between the Onondaga Reservation and Solvay Road in the Towns of Onondaga and Tully, plus purchases of 1-2 miles of PFR's along the West Branch of Onondaga Creek, and ½ mile of PFR's along Fall Creek (Rattlesnake Gulf) in the vicinity of Tully Farms Road. However, the future purchase of public fishing rights is limited to willing sellers only.

The cost of purchasing five miles of Public Fishing Rights at $22,500 per mile (based on DEC provided estimates) is approximately $112,000, and purchase of five public parking areas at a cost between $5,000-10,000 per parking area would amount to another $25-50,000. These costs may be reduced substantially by working out agreements with Honeywell for allowing transfers and/or acquisition of public fishing easements along sections of Onondaga Creek that are presently owned by the company.

Honeywell currently owns and/or leases a significant acreage of land in the upper Tully Valley, including the lands formerly used for salt mining. Honeywell may be willing to allow acquisitions of fee easements and transfers of easements along the upper Onondaga Creek as part of a negotiated Onondaga Lake cleanup agreement.

Actions to date:
Honeywell has constructed a public fishing site and parking lot on its property near Solvay Road where Tully Farms Road crosses Onondaga Creek. However, there are no additional sections of DEC purchased PFR's or designated public parking areas along Onondaga Creek or its principal tributaries, including Fall Creek (Rattlesnake Gulf), and the West Branch.

Participants/Contacts:
Izaak Walton League Central New York Chapter
Onondaga County Federation of Sportsmen's Clubs
Onondaga County Fisheries Advisory Board
Trout Unlimited Iroquois Chapter



Hudson Farms

An Ecological and Recreation Assessment of Honeywell International, Inc.'s Hudson Farm Property

Final Report to:

Honeywell International, Inc.

From the:

Hudson Farm Survey Team
State University of New York
College of Environmental Science and Forestry
Syracuse, New York

Sept. 20, 2005

Survey Team Members:

Pablo Ramirez de Arellano and Matthew Buff — Ecosystem mapping and landscape analysis
Matthew Buff and Matthew Distler— Vascular plants
Dr. John Cooper and Dr. John Farrell — Fishes
Dillon Finan, Kevin Shoemaker, and Nancy Karraker — Amphibians and reptiles
Daniel Crane — Birds
Dr. Mark Lomolino and Scott LaPoint— Mammals
Chris DeBolt — Recreation potential assessment
Dr. James Gibbs and Dr. Donald Leopold — Project oversight and coordination

July 2015

Onondaga County, New York

Natural Resource Damages Restoration Projects Proposal

Onondaga Lake, Syracuse, New York

I. Introduction

Onondaga Lake and its immediate environs have been impacted by decades of hazardous substance releases into and about the lake and its environs. These releases have damaged or resulted in the lost use of natural resources previously found or still existing in each of the open lake, wetlands, upland shoreline and riverine environments associated with Onondaga Lake. Injuries have been suffered by surface water, sediment, geological and groundwater resources. As a result, there is evidence of both ecological damages and human use damages. The ecological damages are the result of injuries to biological resources – vegetation, benthic macroinvertebrates, fish, reptiles and amphibians, birds and mammals. The use damages are the result of lost or eliminated uses and/or diminished use and potential lost cultural uses by indigenous and non-indigenous populations, including the Onondaga Nation, which has long been a steward of the Lake.

The Trustees have stated their intent to generally follow the guidelines for conducting Natural Resource Damage Assessments published by the U.S. Department of Interior including determining the appropriate measure of damages required, in the form of natural resources damages restoration, to fully compensate the public for these damages. In part, the selection and scaling of appropriate primary restoration activities will be intended to reduce future use and service losses, and compensatory restoration actions to reduce interim reductions in services pending full restoration. In doing so, the clear preference of the trustees will be to focus on the restoration of the injured resource. Thus, examples of potential restoration projects identified by the

Trustees have included improved habitat for shoreline birds or water quality in wetlands that support amphibians and reptiles.

In response to the Trustees' November 17, 2014 letter request soliciting suggested or recommended restoration projects, and considering the County's ownership of the vast majority of lands abutting and immediately surrounding the lake and lands dedicated public use as parkland, Onondaga County has invested its time and resources investigating and understanding both the impacts on the lake system's natural resources and restoration activities or projects that address both the public's needs and desires and the mandates of CERCLA and its implementing regulations. Having done so, as described in more detail below, the County proposes the following restoration recommendations:

- In-lake and upland shoreline habitat restoration in conjunction with increased and improved public access;
- Establishment of fishing and boating docks and piers
- Education facilities at and about Onondaga Lake Park;
- Restoration of Murphy's Island resources and environments;
- Restoration or enhancement of Onondaga Creek resources;
- Ecological restoration and enhanced public use opportunities on, at and about the Wastebeds;
- Mitigation of on-going mudboil impacts and restoration of the historically impacted resources; and
- Grants for Municipal Green Infrastructure.

II. Historic Overview

Onondaga Lake's role in the State's history predates the State's quest for territorial expansion and rapid economic development. According to the oral history of the Haudanosaunee, Onondaga Lake was the site of the founding of the Haudonsaunee Confederacy by the Peace Maker. As such, the people of the Onondaga Nation have placed great significance on the need for the environmental restoration of the Lake and its environs.

In 1654, when the first Europeans arrived, they were shown a spring of salt water, which ultimately led to 250 years of salt production on the shores of the Lake. In 1788 the Haudanosaunee transferred some 20,000 acres around the lake to the state of New York on condition "*that it shall remain forever, for the common benefit of the people of the State of New York and the Onondagas for the purpose of making salt.*" That same year, the first two men to commercially exploit the salt springs were Asa Danforth and Comfort Tyler, Revolutionary War veterans who settled on land given to them in lieu of salary by the newly formed government of the United States. Thereafter, the methods of salt production changed over time and the fortunes of the salt industry waxed and waned. By 1920 most of the salt production was used to pack fish, in ceramic production, to de-ice the railroad and trolley tracks, and for use by the chemical companies that were replacing the old salt manufacturing facilities along the shore of Onondaga Lake. In 1922 a wind storm left much of the remaining salt yards in ruins. Some repairs were made and the industry struggled along until August 1926, when the last nine salt workers drew the final batch of brine and the industry closed completely.

1880's view of solar evaporation pans. (From the collection of the Onondaga County Parks Office of Museums.)

Strangely, it was the Great Depression that brought new life to the abandoned area of salt production. Then Governor Franklin Delano Roosevelt turned the state-owned land over to Onondaga County. With funding through the Work Relief Bureau, the County turned the area into a park. Included in the project was the construction in 1933 of the Salt Museum built around a still standing Boiling Block chimney.

Since the early 19th century, Onondaga Lake and its surrounding environment have played an even greater role in the growth and development of the state. This critical role in the state's economic expansion was initially spurred by the Lake's integration into the New York State Canal System, which facilitated the rapid industrial development of the metropolitan Syracuse area and triggered profound changes in the ecology and use of the Lake and its environment.

Since the late 1950's, Onondaga County has invested hundreds of millions of dollars in upgrades to the Metropolitan Wastewater Treatment Plant (METRO) and its associated collection system in increasingly successful efforts to improve the environment in and around Onondaga Lake. Concurrently, the County also has invested tens of millions of dollars to develop parks, multiuse trails and other recreational amenities along the shores of Onondaga Lake,

again aimed at maximizing all potential uses of the multiple resources the Lake represents. As a result of these efforts, the parks and trails along Onondaga Lake now attract over a million visitors a year.

III. The Resources and Identified Injuries

A. Identified Resources

Onondaga Lake is within the Atlantic flyway and provides habitat for a number of DOI trust species, including 112 species of birds during the breeding season, 70 over-wintering species, including the American Bald Eagle (*Haliaeetus leucocephalus*), and 15 waterfowl and 6 waterbird species (TAMS and YEC 2002, National Audubon Society 2005). Migratory shorebirds forage in the shallow water and mud flats along the lakeshore. Killdeer (*Charadrius vociferus*), spotted sandpiper (*Actitis macularia*), and other birds breed along the shoreline and near the lake. Waterfowl use the lake for nesting during the breeding season, and for feeding and resting during migration. Mallard (*Anas platyrhynchos*), blue-winged teal (*Anas discors*), wood duck (*Aix sponsa*), common tern (*Sterna hirundo*), and others breed along the lake shore. Waterfowl nest along the northwest shoreline of the lake and in marshes near the Ninemile Creek waste beds. Other DOI trust species present include tree swallow (*Tachycineta bicolor*), red-tailed hawk (*Buteo jamaicensis*), belted kingfisher (*Ceryle torquata*), osprey (*Pandion haliaetus*), great blue heron (*Ardea herodias*), double-crested cormorant (*Phalacrocorax auritus*), black duck, green-winged teal (*Anas crecca*), and redhead (*Aythya americana*).

Historically, the lake supported a coldwater fishery with species such as Atlantic salmon (*Salmo salar*), cisco (*Coregonus artedii*), American eel (*Anguilla rostrata*), and burbot (*Lota lota*) (Auer *et al.* 1996). By 1927, a fishery survey reported that the coldwater fishery had been disturbed due to

the impacts of soda ash production. The Onondaga Lake fishery is now characterized as a warmwater fish community reportedly dominated by gizzard shad (*Dorosoma cepedianum*), carp (*Cyprinus carpio*), and white perch (*Morone americana*). Sunfish are abundant in the littoral zone. The lake supports several important sportfish, including channel catfish (*Ictalurus punctatus*), largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieui*), and walleye (*Stizostedion vitreum*). It is understood that the composition of the fish community in the lake varies seasonally, with migration between the Seneca River and the lake being an important contributor to the variability (Tams and YEC 2002). During colder periods in the year, the Lake draws coldwater species such as brown trout and white bass (OCDWEP 2007).

Over 300 acres of wetland exist adjacent to Onondaga Lake and along tributaries to the lake, including approximately 320 acres of state wetlands that are either directly connected to Onondaga Lake or within its floodplain. Habitat types in the complex of wetland around the lake include forested wetlands, scrub-shrub wetlands, emergent wetlands, and floating aquatic vegetation. Additional smaller wetlands are found along its tributaries. These wetlands support birds as mentioned above, as well as amphibians, reptiles, and mammals, upon which birds and fish depend.

B. Recognized Injuries

There are known injuries to the above-described ecosystems and the fish, reptiles and amphibians, mammals and migratory birds they support, by way of example only:

- Sediments exhibit toxicity to amphipods and chironomids, and/or have reduced benthic macroinvertebrate diversity. This impaired quality of the sediments as a result of contamination results in a reduction in the quality of the habitat for migratory birds.

- Data shows that the amphibian populations of Onondaga Lake are depauperate (Ducey 1997). Data indicate that Onondaga Lake itself and any wetlands directly receiving lake water, appear not to support amphibian reproduction and exhibit reduced species richness (Ducey and Newman 1995, Ducey *et al.* 1998). This impaired quality of the ecosystem results in a reduction in the quality of habitat for migratory birds, particularly those that use amphibians as a food source, such as herons

Lost or reduced uses damages have also been demonstrated. Research conducted under the RIA indicated that, absent contamination, the Lake could support higher levels of or higher values for swimming, wildlife viewing, and although not yet quantified, the Lake would have supported higher levels of land based recreation such as biking, walking, wildlife viewing and picnicking.

IV. **Project Objectives**

Known as the "public trust doctrine," New York courts have held that parkland held by a municipality is for the benefit of the public at large and not just for the benefit of residents of the local community. Moreover, the courts have consistently held that "once land has been dedicated to use as a park, it cannot be diverted for uses other than recreation, in whole or in part, temporarily or permanently, even for another public purpose, without legislative approval." Indeed, merely terminating public outdoor recreational uses of park property requires legislative approval. As explained by the New York courts,

> A park is a pleasure ground set apart for recreation of the public, to promote its health and enjoyment. It need not, and should not, be a mere field or open space, but no objects, however worthy, such as courthouses and schoolhouses, which have no connection with park purposes, should be permitted to encroach upon it without legislative authority plainly conferred, even when the dedication to park purposes is made by the public itself and the strict construction

> of a private grant is not insisted upon. . . . Monuments and buildings of architectural pretension which attract the eye and divert the mind of the visitor, floral and horticultural displays, zoological gardens, playing grounds, and even restaurants and rest houses, and many other common incidents of a pleasure ground, contribute to the use and enjoyment of the park. The end of all such embellishments and conveniences is substantially the same public good. They facilitate free public means of pleasure, recreation, and amusement, and thus provide for the welfare of the community. The environment must be suitable and sightly or the pleasure is abated. Art may aid or supplement nature in completing the attractions offered.

See, Williams v. Gallatin, 128 N.E. 121, 122-23 (N.Y. 1920).

Map of Parks Property around Onondaga Lake

Given the longstanding use of County lands that adjoin the lake as parkland, the loss or diminished use of the lake' s resources, the legal imperative to maintain parkland as parkland, the County is focused, in part, on issues of access and reducing any future loss or reduction in use. That being said, the County submits that the restoration of lost uses can and should be enhanced and the gross benefit to the population as a whole can be magnified if the restoration of surface water, groundwater, geologic and biological resources (including both flora and fauna) are integrated into and made a component part of projects intended to abate loss of use damages. Doing so serves not only intrinsic and natural value but also recreational and

historic cultural value to humans. Recreational activities such as hiking, running, and bird watching, kayaking and fishing (among many others) are directly affected by the quality of the resources available for these activities. Thus, it is the community's best interest to secure investments in the ecological restoration of the habitats in and surrounding the Lake. The creation and restoration of habitat in these areas will both positively affect the natural and anthropogenic uses of these areas. The County's goal is to continue to seek enhancement of the quality of and accessibility to these natural resources so that the public can enjoy them and increase the quality of life for all state residents, who will benefit from these restored resources.

V. Proposed Projects

The objective of the County proposed restoration projects is to incorporate ecological and habitat restoration and creation as an element of and contemporaneous with increased access and recreational uses. Both the County and the general public have expressed the desire for such restoration. Ecological restoration, recreation and historic cultural representation will jointly make the Lake a greater asset for our community and the natural environment. There is great opportunity for many of these projects to be impactful in all three goal areas and protect and enhance not only the natural resources in and around the Lake but also provide recreational opportunities for the public. NRD restoration projects, focused on ecological restoration and increased recreation and public access, include:

- Restoration and stabilization of the eastern shoreline with enhanced wildlife habitat;
- Increased public access via western shore trail;
- Establishment of fishing and boating docks and piers;
- Education facilities installed at and about the Onondaga Lake Park;
- The restoration of Murphy's Island habitat and resources;

- The restoration and/or enhancement of Onondaga Creek resources;
- Ecological restoration and enhanced public use opportunities on, at and about the Wastebeds;
- Mitigation of on-going mudboil impacts and restoration of the historically impacted resources; and
- Promotion of municipal green infrastructure.

A. The Eastern Shore Stabilization and habitat restoration

In 2004, the US Army Corps of Engineers conducted a study, "Onondaga Lake Trail 3C & Habitat Project" (the "Habitat Project"), which investigated the concept of an in-lake constructed earthen embankment to create the low energy zone needed to support habitat creation. It was estimated that through the construction of the embankment, as much as 29+ acres of various habitat types could be created. The fact that the embankment could also be used to support a trail along the east shore and thus, close the remaining gap of the Loop the Lake trail, and thereby avoid conflict with the CSX railroad, parkway and interchange, was a significant added benefit. The *Habitat Project* concept was presented at a public information meeting held at the Liverpool Public Library in June of 2004, but the projected costs for the project exceeded the available funding and the project went dormant.

Diagram from 2004 Habitat Project Plan

The County proposes that now is the time to implement the *Habitat Project*, which will serve to restore multiple varieties of lost habitat both on- and off-shore, offset damages to flora and fauna and increase access.

1. Habitat Restoration

This project seeks to re-establish critical habitat along the shore of the Lake. The habitats described below are proposed as part of this project.

Please note that the *Habitat Project* study included a detailed Geotechnical Subsurface Investigation report that ascertained that the construction of the embankment was feasible.

This restoration would serve two important purposes. Most importantly, the embankment would serve to restore and/or create new and diverse habitat that has been lost over the years along a substantial portion of the lake shoreline. Second, the embankment would provide a means for extending the Lake Trail around the lake from Bloody Brook to Onondaga Creek with a combination of on-land and in-lake structures.

2. Shallow Water Marsh Habitat (15.1 acres)

This habitat was selected to enhance and expand upon a habitat that currently is limited in Onondaga Lake. Inland salt marshes, freshwater emergent and forested wetlands occurred historically around the lake and along the major tributaries inland from the lakeshore. While the lowering of the lake surface in the 1820s likely affected some of these wetlands, filling for wastebed use, transportation, and industrial facilities eliminated much of the original wetlands around the lake. Much of the shallow water marsh habitat that is available is dominated by invasive species, primarily phragmites. This habitat would be located in water depths of less than one meter and primarily consist of non-persistent emergent plants that are rooted in the substrate, emerge above the water surface, but die back during the winter months. This will potentially provide habitat for Northern Pike (*Esox lucius*) resting and spawning and cover for Pumpkinseed (*Lepomis gibbosus*) and various young-of-year fish species. Other species likely benefitting from this marsh habitat include snakes, turtles, frogs, muskrat, and birds including dabbling ducks, herons, and kingfisher.

3. Submerged Aquatic Vegetation Pilot Habitat (2.9 acres)

In 2003-2004 when the *Habitat Project* was first developed, submerged aquatic vegetation (SAV) coverage in the lake was still sparse, with less than 100 to 150 acres throughout the entire littoral zone between (OCDWEP 2003). By 2003 SAV acreage increased to 250 acres and by 2005 to over 350 acres throughout the littoral zone (OCDWEP 2006). SAV has been identified by many researchers to be important to the diversity, distribution, abundance, and productivity of the fisheries in northern temperate lakes, with a higher diversity and life stages observed in areas with vegetation (Pratt and Smokorowski, 2003). This habitat was included as a pilot to create habitat behind a jetty where wind/wave action would be minimized allowing plants to root in the substrate. This pilot area as well as other areas along the 2.5 mile trail will likely naturally re-colonize with SAV providing habitat to fish species including Yellow Perch (*Perca flavescens*), Largemouth Bass (*Micropterus salmoides*), and

other juvenile fish. In addition, dabbling and diving ducks and other birds that feed by diving in the water, as well as wading birds, such as the great blue heron will utilize this habitat. Mammals also may use the shallow areas of this habitat as a travel corridor.

4. Large Woody Debris Habitat (5.3 acres)

Within lakes, structures other than macrophytes can include woody debris, fallen trees, and substrate differences where the distribution of such structure is a function of wave action, slope, and wind (Smokorowski and Pratt, 2007). Large woody debris was thought to be sparse in the lake and additions of such debris will provide more diverse habitats for many fish species. Addition of large woody debris to the deeper water along the proposed trail will provide habitat for Smallmouth Bass (*Micropterus dolomieu*), Walleye (*Sander vitreus*) and shallower water will provide foraging, basking, and roosting areas for birds, reptiles, amphibians, and mammals, and cover for spawning fishes. Along the shoreline anchored logs also can provide structure for fish, birds, reptiles, amphibians, and mammals as well as wind and wave protection.

5. Rock Shoreline Habitat (6.1 acres)

Rock shoreline habitat is proposed along the trail in areas of shallow water as well as adjacent to drop off areas. This habitat will reduce wind and wave action and potential erosion of softer substrates in the shallow areas and provide fish habitat adjacent to drop-offs of the bottom. This habitat is included in the conceptual plan to increase habitat diversity as well as provide stabilization along the lake-side edge of the islands. Lake sturgeon (*Acipenser fulvescens*), Walleye, and Smallmouth Bass also may use these drop-off areas, while shorebirds, reptiles, and amphibians will use the shallow rock shoreline.

B. The Loop the Lake Trail

The concept of a "Loop the Lake" trail around Onondaga Lake originated in the mid-1960's, when City Parks Commissioner Jim Heath challenged his

staff to identify the method and means by which they could connect the City to the surrounding fabric of the Greater Syracuse community. The vision of a contiguous open space system, extending along Onondaga Creek from the hamlet of Nedrow, NY to Onondaga Lake and a trail that looped around the Lake was born and promoted for years.

The early '80's saw a big step forward with the establishment of Onondaga Lake Park, which included the nascent Loop the Lake trail system. A detailed study, sponsored by Onondaga Co. Parks and NYSDOT, was completed in 1992. The trail study identified segments of the trail system that had been built to date, and segments of trails and bridges yet to be built. In 2004, the West Shore trail was constructed, extending the existing trail over the Seneca River outlet and along the west side of the Lake to Nine Mile Creek. Further expansion of the trail system was completed in 2014, with the opening of a trail segment through the Solvay wastebeds, including a bridge over Nine Mile Creek.

The County also has advanced planning studies for the segment of trail that would cross the CSX railroad mainline at the southwest corner of the Lake, as well as for the connection to Hiawatha Blvd. Part of a city of Syracuse project scheduled for 2016 will construct pedestrian facilities and bike lanes along Hiawatha Boulevard, which is immediately south of the Lake. The Hiawatha component will connect to the existing Onondaga Creek trail system at the Destiny Mall and thus, will complement and assist in completing the trail. When these listed projects are completed, they will fulfill the dream envisioned in the 1960's and create the first continuous trail system connecting the Village of Liverpool (and the suburbs beyond) to the City of Syracuse, linking trail users with businesses, parks, civic and educational institutions, and cultural centers along its path.

As explained to the Onondaga Lake Partnership in 2002 by the then County Executive Nicholas J Pirro, the County's trail project is intended to rehabilitate aquatic, shoreline and upland habitat and provide public access

and recreational opportunities. In 2004, an in-lake trail section was identified and discussed in the Lake Bottom remedial investigation prepared for Honeywell by Exponent.

The last segments necessary to complete the Loop the Lake trail system are the southwest corner of the Lake and the eastern shore from Ley Creek to Onondaga Lake Park.

To date, the Loop the Lake project has been constructed with no specific focus on addressing the loss of habitat that accrued during two plus centuries of development around the Lake. The remaining undeveloped segment of the Loop the Lake project, along the south and eastern shore, is the last and best chance to address this loss of habitat in the context of completing the Loop the Lake Trail.

Renewed interest in completing the Loop the Lake project has come about in response to many factors, including the substantial trail construction progress of late on the west side of the Lake. Issues such as the need for alternative modes of travel, connecting urban to suburban areas, connecting workers with the workplace, and a higher focus on improving the overall health of our community, have all contributed to the interest in completing the Loop the Lake project.

1. Western Shore Trail

This project will complete the multiuse trail access for the western portion of the Lake. This trail will follow the footprint of the current construction paths used by Honeywell and connect to the northwestern portion of the trail near the last outlook pavilion at the current terminus. After crossing Harbor Brook, Onondaga County Department of Transportation has secured funding for a bridge that will cross over the CSX railroad, running parallel to Interstate 690. Restoration funding is required for those portions of the trail that follows the construction paths and to provide trail users a seamless experience from one segment of the trail to the next. Additional nature trails, or

those not paved, also should be included to provide pedestrian access to the flora and fauna around the area. Besides creating connectivity around the Lake, this location provides for excellent wildlife viewing, especially the American Bald Eagles that now roost on the southern shore of the Lake.

C. Construction of Fishing Docks and Piers

Interest in fishing, swimming and boating in Onondaga Lake has grown with the progress in remediating this community resource. Onondaga County anticipates continued growth in this public interest and recommends the construction of publicly accessible fishing docks and piers as a means of redressing past lost use opportunities through the NRD process. These docks will allow the public to recoup the lost years of angling, sailing, rowing and more while also promoting opportunities for research through public access. The piers will give the public more recreational opportunities, such as walking and socializing, and allow more access to enjoy the environment surrounding the Lake. Currently the only docks for docking boats are on the eastern shore at the yacht club. Creating more opportunities for the public to access the lake via the western shore will significantly increase public access to the lake.

D. Environmental Education

The focus of this project is environmental education through the construction and implementation of educational resources on, at and about Onondaga Lake. Examples of educational resources include signage placed near native plants and vistas to educate and inform trail users about the environment they using and enjoying. Simple educational resources, like signage, can have a profound impact in a park, leaving the visitor more informed and aware of their environment and the resources it provides. These practices also will assist in bringing the community back to the Lake, change the dated paradigm that views the Lake as a liability, not as a resource, and promote environmental stewardship. This same concept has been implemented at Seneca Meadows Landfill and has had success enlightening the public on

the sustainable and various green practices that have been implemented at the landfill over the years and to date.

E. The Restoration of Murphy's Island

The restoration of the environments and resources available on, at and about Murphy's Island is critical to restoring the southeast corner of the lake. Reportedly a man made "island," this site is comprised of fill containing industrial waste that restricts or limits the potential of what could and should be a productive natural habitat. This recommendation focuses on restoration and, as may be necessary the remediation and clean-up, of this 36-acre parcel of land, thereby, transforming it into an area rich with ecological resources and a healthy habitat for native plant and animal species.

Murphy's Island defines opportunity, especially in the context of restoring lost habitat and potentially invigorating lost cultural uses. This location is part of migratory bird flyways and if habitat was created, Murphy's Island, considering its close proximity to the Lake, would serve as a hospitable habitat for migrating and native avian species. Since this land is technically considered a wetland, amphibian and some terrestrial species would also find Murphy's Island a suitable habitat. The island is swampy, similar to the other wetlands surrounding the Lake; therefore native species from the area will find a restored Murphy's Island ideal habitat.

F. Onondaga Creek

This proposal is focused on the expansion of the Onondaga Creek trail and restoration of parks and flora along the Creek. It is the outgrowth of a comprehensive study of the Onondaga Creek Corridor by Professor Emanuel Carter, of SUNY-ESF, and his Landscape and Urban Ecology landscape architecture studio students (LSA 670), who conducted a comprehensive study of the Onondaga Creek Corridor with a focus on the expansion of the Creek trail system and restoration of parks and vegetation along the creek (Carter, *et*

al.). The proposal recommends creating a four season multi-use trail along the Onondaga Creek Corridor that would serve not only recreational purposes to the user but also an alternative travel route for commuters in the adjacent neighborhoods (Carter, *et al.*). Native flora would be planted along the shoreline of the creek and the trail. In turn, native vegetation would attract native bird populations and/or enhance their habitat along the creek. The study also proposes numerous practices and projects intended to improve, enhance or restore the ecology of the Onondaga Creek watershed. Such projects include creating and enhancing habitat diversity, the planting of native species, establishing greenway corridors that link other open space systems, and implementing education programs that both involve and inform the community about the Creek and how to maintain the ecosystem to maximize its natural resources and the resulting benefits (Carter, *et al.*).

The concepts and recommendations that resulted from the LSA 670 study will, in their current format or as modified based on the recommendations of the Trustees and other interested parties, serve to both restore and revitalize the Lake system as a whole.

In addition, the County recommends the creation of pilot project funding for Onondaga Environmental Institute (OEI) and Onondaga Lake Watershed Partnership (OLWP) by the NRD funding, as a means of readdressing past loss use opportunity through NRD process. The now expired Onondaga Lake Partnership (OLP) was the source of a great deal of pilot funding which was used to research and propose solutions to issues related to Onondaga Lake. Onondaga Creek could benefit from this model which fosters local innovation and ensures researchers have access to funding.

G. Wildlife Trail and Habitat Enhancement of the Wastebeds

There are vast opportunities for ecological restoration and access/recreational development at, on or about Wastebeds. This recommendation is intended to secure even greater focus on those

opportunities, and more specifically the experimental opportunities being explored by Honeywell and SUNY-ESF. Honeywell is currently partnered with the State College of Environmental Science and Forestry (SUNY-ESF) managing a shrub willow farm at the Solvay Settling Basin in Camillus. This experimental farm will examine whether the growing of shrub willow for the use as a bio-fuel will prove productive, sustainable and financially feasible as a potential alternative energy/fuel source. If successful and productive, the planting of shrub willow on the Wastebeds could be an area for alternative energy source development for both the County and the City of Syracuse. If implemented on this site, it also would provide habitat for displaced wildlife. Further, a trail system could be created for the public to use and signage could be installed in key locations to inform the public of the history of the wastebed site, its current restoration, and the science behind using shrub willow as a bio-fuel.

Historically, the land surrounding the Lake has been classified as wetlands, including bogs, swamps and marshes. Wastebeds are part of this historically wetland area as such it included bogs, marshes and swamps and was home to a variety of native plant species and wildlife, including migrating fowl and the American Bald Eagle. Whether as a small or large scale willow bio-mass project, efforts and action needs to be taken to restore this location to the maximum extent possible as an ecological resource and habitat for the maximum variety and scope local species.

H. The Tully Valley Mudboils

The Tully Valley mudboils are a phenomenon unique to Central New York and the source of sediment in Onondaga Creek and Onondaga Lake. The mudboil sediment increases the turbidity of the Creek and southern portions of the Lake, thereby negatively impacting the ecology and general observed quality of the water in both the Creek and Lake (Upstate Freshwater Institute 2015).

The County recommends that the mudboil area itself and/or the Creek or Lake are appropriate locations for additional restoration projects as

identified by the Trustees and public stakeholders. The goal of this project will be the long-term resolution of the impacts associated with the mudboils, the restoration of impacted lost or reduced resources. While it is still not clear what the actual proposed remedy or restoration plan may be, the County fully supports the Trustee's securing one or more recommended solutions by an expert panel that would benefit both the Creek and the Lake.

Both the County and the NYSDEC have committed to support such an expert panel tasked with reviewing the history of the mudboils and to provide recommendations as to how best to address the resulting sediments issues and potential and appropriate restoration projects. Committing the NRD process to supporting the recommended solution would ensure these efforts address the negative effects of the mudboils.

I. Grants for Municipal Green Infrastructure

Onondaga County has demonstrated the value and economic benefits that green infrastructure (G.I.) can provide in reducing the deleterious impacts of stormwater in the urban area of the Onondaga Lake watershed. This proposal is intended to expand the use of G.I. and similar related benefits throughout the Onondaga Lake watershed, focusing particularly on non-point source and agricultural run-off as a means of improving and preserving water quality and associated habitat restoration gains in the Lake.

This proposed expansion of G.I. to assist communities to develop and implement significant G.I. stormwater and agricultural run-off initiatives would expand the capabilities of local governments and the Soil and Water Conservation District capabilities to undertake significant non-point pollution control projects.

The success of the Save the Rain program provides a model that the NRD Trustees can utilize as the basis for including G.I. projects in the portfolio of funded projects that can meet both restoration and retention/treatment

objective. As with the Save the Rain program, the Trustees could set aside restoration funds that can be awarded by allowing municipalities to compete for funding on an annual basis through a grant application process that focuses on the ability of proposed projects to meet restoration, treatment and conservation objectives.

Onondaga County has been very effective at promoting the use of G.I. within the areas served by public sewers. By assisting local governments with the financial costs of incorporating G.I. into public works programs, the County has been able to increase use of G.I. as a means of promoting practices aimed at reducing inflow and infiltration (I&I) to the public sewers. The County has demonstrated that G.I. can be used as a stormwater related pollution abatement strategy. Based on this demonstrated success, the County urges the Trustees to incorporate G.I. projects in their efforts to promote restoration of the entirety for the Onondaga Lake system and its related environs.

VI. Budget

Onondaga County is currently seeking funds to assist in restoration of the eastern shore habitat and shoreline build up, along with completion the Loop the Lake trail project, particularly the construction of necessary bridges. Those funds will not however be adequate to support the enhanced restoration of resources that the County has proposed here, all of which would be maximized by the establishment of a trial in the Lake itself.

The County estimates a minimum of $16.7 million or more in NRD restoration funding will be required to successfully implement the eastern shore habitat restoration and shoreline build up. Based on potential additional or modified enhanced restorations components as requested by the Trustees, the cost may exceed the above preliminary projection.

Onondaga County is also seeking $750,000 to fund trail construction on the footprint of current Honeywell working paths. That funding will supplement

Federal DOT monies that will allow for the construction of the bridgework necessary to this trail segment with the current western shore trail, but not the recommended and complementary restoration components. Again, providing funding for the Loop the Lake project will allow for maximum ecological restoration conducted in conjunction with trail construction and at the same time provide for significant increased access, recreational and educational opportunities.

With respect to the County's other proposals, they are too preliminary at this point in time to allow for meaningful budget projections. More information is necessary before even a preliminary budget can be crafted. Should the Trustees indicate a willingness to consider and pursue these additional recommendations, the County will be able to assist, as may be necessary and appropriate, by providing the level of detail necessary to establish initial budget estimates.

VII. Conclusion

The County submits its proposals, to provide an opportunity for the Trustees to maximize the restoration of resources in conjunction with a vision and project the County has been pursuing for 50 or more years.

The proposed projects, particularly those focused on restoring habitat projects will improve or restore lost, damaged or diminished habitats that in turn will support the restoration of vegetation, benthic macroinvertebrates, fish, reptile and amphibian, bird and mammal resources. At the same time, these projects will compensate the community for its lost access and use over many years and mitigate against any future lost use damages.

Beginning in the 1930's with the transfer of the former state-owned salt works, there has been significant investment over the intervening years by the residents of Onondaga county, private parties and the state and federal government to remediate conditions at, on or about the Lake and its environs

and to return Onondaga Lake to a public resource. The County submits this proposal as an aspect of the County's ongoing efforts to restore Onondaga Lake and its environs.

VIII. Addendums

Addendum 1: Case Studies

Settlements for NRD cases have frequently been used to recover and enhance natural resources associated with recreation and the recreational structures themselves. In the case of a bridge crash and oil spill in San Francisco, the settlement compensated in part for lost recreation uses. Due to the loss of recreational opportunities for the public, the city suffered loss of revenue from activities serviced by the park. Many parks require an admission fee or have equipment rentals upon entering the park that bring in revenue for the municipality that runs the park. The loss of visitors and recreation uses to the park was seen as damage and thus compensated justly. Approximately $9 million was given to local government to fund shoreline recreational projects. These projects are similar to the proposed projects of creating jetties, piers, fishing docks, wetland creation and multiuse trails. Shoreline restoration is key in maintaining a healthy and prosperous ecosystem along any water body's shore. Furthermore, $5 million was used to fund bird restoration, $4 million to fund habitat restoration, $2.5 million for fish and eelgrass restoration and $18.8 million for recreational use improvements. The local government distributed the largest amount from the settlement to fund recreational use improvements because they saw the damages done to their recreational resources too great not to repair and improve. Recreation not only affects the natural resources in an area but more so the humans in the area and their quality of life. Improving recreation in a community directly affects the community's quality of life, which directly affects the city's image.

The Housatonic River in Massachusetts suffered damages to its natural resources over many decades and in the early 2000s received a settlement of $15,000,000 for natural resource remediation. The injured resources at this site included surface water, riverbank and floodplains, fisheries, wildlife, aquatic life, vegetation and recreational fishing and boating. The NRD trustees

distributed $250,000 to create a park with the goals of protecting wildlife habitat and providing recreational opportunities. $415,000 was distributed to enhance public access to the river. Similarly, funding should be distributed to the various projects enhancing public access at Onondaga Lake. Both the County and the public have expressed a great deal of interest in increasing the amount of public access to the Lake. $244, 047 was distributed to fund the creation of a passive trail that gives the public more access to the river. The Housatonic River NRD case puts a great deal of emphasis on the recovery of injured natural resources and how they affect recreational uses. The NRD trustees in this case appropriated portions of the settlement the state received to enhance recreational opportunities, which the NRD trustees should look to in the case of Onondaga Lake in distributing funding for projects that not only protect and restore the natural resources of the Lake but also enhance recreational opportunities.

In regards to the case of the Guadalupe River, the water quality, aquatic species health and fish habitat were all injured. Funding to restore these resources were obtained mostly from grants and matching funds. The Parks and Recreation department near the upper region of the river received $2 million to restore the conditions of the parks injured in the area. The downtown San Jose region received $12 million to fund trail improvements, park acquisition and landscaping. The Los Gatos Creek Reach 4 region received a $200,000 Recreational Trails Program grant at the state level and a $100,000 Habitat Conservancy Program grant at the state level. It should be noted that the city of San Jose takes the health of the Guadalupe River's resources into great consideration and appropriated large sums of funding to restore recreational uses for the public to enjoy those resources. A great deal of funding was also used to create and maintain trails around the Guadalupe River.

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APPENDIX D. ADDITIONAL RESTORATION PROJECT IDEAS SUBMITTED TO TRUSTEES DURING THE PUBLIC COMMENT PERIOD FOR THE DRAFT RESTORATION PLAN AND ENVIRONMENTAL ASSESSMENT

The following is a compilation of project ideas submitted to the Trustees between April 24, 2017, and July 17, 2017. Their inclusion on this list does not imply that they are being considered as restoration projects or that they would be suitable NRDAR restoration projects. For the purposes of NRDAR, restoration projects must restore, replace, rehabilitate, or acquire the equivalent of injured natural resources and resource services lost due to the release of hazardous substances. The Trustees will be performing additional restoration projects through the use of the future project fund, and will consider whether these types of projects meet the criteria at a later date.

Ecological, Habitat Protection, Water Quality Projects (non-Onondaga Creek)

- Atlantic salmon restoration
- Create salt marsh along Onondaga Creek
- Alleviate mudboils
- Improve water quality
- Aerate the lake
- Abate combined sewer overflows
- Shallow water cattail areas for birds
- Address invasive weeds along West Shore Trail
- Cool wastewater treatment effluent to benefit coldwater fishery
- Inland salt marsh along Onondaga Lake parkway
- Restore native trees
- Sound barriers along highways
- Mudflat creation
- Common tern nesting platforms
- Support stewardship grant program - West Branch Onondaga Creek corridor, Peppermill Gulf

Onondaga Creek Projects – Ecological and Human Use

- Un-channelize Onondaga Creek; return to a more natural state within City of Syracuse
- Extend Onondaga Creek Walk
- Develop projects along Onondaga Creek (increase accessibility, make more natural)
- Canoe/kayak access at Kelly and Kirk Parks, Armory Square, Inner harbor
- Renaturalized area at Arsenal Park
- Enhance Creek Walk Phase 2 opposite Kirk Park

- Create wetland retention area upstream of City to reduce mudboil sedimentation
- Rich Street overlook
- Spencer Street barrier mitigation
- Dorwin Avenue fish ladder
- Seneca Turnpike overlook/access area
- Widen Kirk Park, slow down water, have canoe and kayak access
- At least 6 access points on Onondaga Creek - like behind the MOST (Milton J. Rubenstein Museum of Science and Technology)
- Increase ecological restoration at Kirk Park, section south Ballantyne Road
- Work at Kirk Park, Onondaga Park, and Elmwood Park

Education/Outreach Projects

- Increase educational signage
- Fish consumption signage
- Advance outdoor recreation and education in City of Syracuse
- More information in visitor center on lake history
- Curriculum development for schools about industrial history
- Project that funds a broad, thorough, culturally, and socially appropriate outreach campaign on health hazards of consuming fish from lake
- Educational initiatives that address lake's ecocultural legacy - curriculum development
- Public education and outreach about fish consumption
- Turn visitor center into nature center
- Encourage use of restoration projects by school children - fund for field trips
- Support for Onondaga Lake Historical Ecology website
- Educational signage along trails

Trail Projects

- Complete Loop the Lake Trail
- Public use trails at Tully – horseback ride, hike, bike, ski
- Biking on Erie Canal Trail
- Mountain bike trails – Tully & wastebeds
- Improve trail vistas and access
- Work on east side trail and access
- Wheelchair accessible trails
- Existing trail maintenance
- Great Law of Peace Center trails and plantings
- Complete Loop the Lake Trail to Inner harbor

Onondaga Nation Cultural Projects

- Designate Haudenosaunee sacred areas
- Return land to Onondaga Nation
- Curriculum indigenous values
- Traditional gardens
- Public education about Haudenosaunee - kiosks, make copies of Onondaga Nation Vision available, Great Law of Peace Center support
- Return lands to Onondaga Nation - Tully or former Bailey Farm
- Include plants of cultural importance in projects

Boating Projects

- Promote sailing
- Kite-boarding access on the lake
- More boat launches
- Motorized boat launch – east side
- Boat building supplies and education program for youth

Other Projects

- Upgrade playground at Onondaga Park
- Performance facility at Willow Bay
- Flood control
- Restore Gere Lock
- Reduce Hg levels in fish
- Murphy's Island (disposal site; acquire)
- Upgrade pedestrian bridge over Route 690
- Billboard at Willow Bay or elsewhere with information on Great Law of Peace
- Alleviate onerous flood insurance requirements
- Replace chain link fence along Route 690
- Shoreline stabilization
- Remove mud spoil and weeds between Hiawatha Boulevard and Willis Avenue
- Compensate families impacted by Wastebed 13
- Fund for urban resiliency projects
- Widen Onondaga Creek, reduce slope of walls and increase flood capacity
- Return edible fish - whitefish, horned dace, Atlantic salmon
- Fund a fish trade program
- Entertainment for the public restored to Onondaga Creek
- Develop fund that lasts at least seven generations
- Bathrooms along trails
- Turn NW side opposite Willow Bay into campground

- Assist Marcellus financially with phosphorus TMDL mandate
- Research into why creek is flooding and what can be done
- Remove fence and weeds along Onondaga Creek
- Public beach on lake

APPENDIX E RESPONSIVENESS SUMMARY

Preamble

The purpose of this Responsiveness Summary is to present and respond to public comments submitted to the United States Fish and Wildlife Service (USFWS) and New York State Department of Environmental Conservation (NYSDEC) on the Draft Onondaga Lake Natural Resource Damage Assessment Restoration (NRDAR) Plan and Environmental Assessment (draft RP). The 90-day public comment period was held between April 24, 2017, and July 17, 2017. The USFWS, acting on behalf of the United States Department of the Interior (DOI), and the New York State Department of Environmental Conservation (NYSDEC), acting on behalf of the Commissioner of Environmental Conservation, (collectively, the "Trustees") held four public meetings on the draft RP, occurring on April 27, May 11, May 18 and May 19, 2017, as well as a public hearing on June 22, 2017. These meetings were attended by more than 250 individuals. At each of these five public meetings/hearing, the Trustees presented an overview of the Draft RP, and provided an opportunity for attendees to interact with representatives from the USFWS and the NYSDEC.

The Trustees received written responses and comments during the public comment period from over 230 sources that consisted of municipalities, state and federal agencies, the Onondaga Nation, nonprofit entities, other organizations and associations, businesses, and individuals. Due to significant interest from the public, the public comment period was extended from 45 days to 90 days and a public hearing was held on the evening of June 22, 2017, at which 45 individuals voiced comments on the record. In addition, the Trustees met with attorneys representing the Onondaga Nation during this comment period on July 14, 2017, to discuss restoration projects.

Since beginning to study injuries to Onondaga Lake and the watershed, and throughout the process, the Trustees worked to involve a wide range of stakeholders. The Trustees will continue stakeholder involvement and participation, holding restoration project scoping meetings, and engaging stakeholders throughout restoration implementation. The Trustees value the input of the stakeholders in the area.

This Responsiveness Summary summarizes public comments on the RP, grouped by categories, and provides the Trustees' responses to those comments. Appendix D provides a list of additional restoration project ideas submitted during the 90-day comment period that will provide the Trustees with restoration project categories to explore with additional funding.

Changes have been made to the Restoration Plan in response to public comments. Specifically, the Trustees have added information on the proposed projects in Appendix B, as well as those projects not proposed for implementation at present in Exhibit 4-4. All project suggestions submitted in response to our request for project suggestions are included in Appendix C. We have added text to clarify our assessment methodologies, explain the public participation process, and discuss the role of the Onondaga Nation. We have also clarified that Alternative B, the preferred alternative, is a suite of projects

that best meet the regulatory criteria. We recognize that certain geographic areas (e.g. Onondaga Creek) are not represented in Alternative B, but the trustees will consider projects in those areas as we plan for additional projects under the Future Project Fund, as appropriate.

A. Comments on Public Involvement

A1. Extend Public Comment Period

In response to requests for a longer comment period, the Trustees extended the public comment period from 45 days to 90 days.

A2. Hold a Public Hearing

Also in response to public comment, the Trustees held a public hearing on June 22, 2017, at the Southwest Community Center. This hearing was recorded by a court stenographer and hosted by an Administrative Law Judge experienced in these types of meetings that allow members of the public to place verbal comments on the record. This hearing was in addition to four other public meetings held at three locations around the City of Syracuse. The transcript from that public information hearing can be found at http://www.fws.gov/northeast/nyfo/ec/onondaga.htm and participant comments are addressed below.

A3. Meeting with Counsel for the Onondaga Nation

One commenter requested a meeting at the Onondaga Nation.

Response: A meeting was held at the office of the attorneys for the Onondaga Nation on July 14, 2017, to discuss the restoration projects.

A4. Schedule for Future Public Participation and Submission of Project Ideas

One commenter requested that future public participation opportunities should be discussed in the RP.

Response: The RP discusses the existence and eventual expansion of a Restoration Project Fund. Prior to additional projects being implemented by the Trustees utilizing that fund, the Trustees will provide additional opportunities for public and stakeholder participation.

A5. Convene Citizen's Advisory Panel to review future projects

One commenter requested that a Citizen's Advisory Committee be convened to review future projects and review the progress of approved projects.

Response: Natural Resource Trustees are federal natural resource management agencies as designated in the National Contingency Plan and any state agency designated by the Governor of each state, pursuant to section 107(f)(2)(B) of CERCLA, 42 U.S.C. § 9607(f)(2)(B), that may assert claims for damages under section 107(f) or 111(b) of CERCLA. In this case, the NYSDEC, acting on behalf of the Commissioner of Environmental Conservation, and the USFWS, acting on behalf of DOI, are the Natural Resource Trustees. These Trustees are responsible for selecting and ensuring the implementation of restoration projects under both Federal and State law, and will

continue working with stakeholders and the public throughout the process as described in Response A4 above.

A6. Allow for larger space on form for project submittals

A number of commenters felt that the restoration project suggestion form did not allow sufficient space to provide project information that could then be fairly evaluated.

Response: Individuals were not limited to the one-page restoration project suggestion form. The Restoration Suggestion Form expressly stated "Please complete as many sections as possible. Your suggestion will be considered even if you are unable to fill out every section. *If you need more space, please use additional paper and label appropriate sections*" *(emphasis added).*

A7. Public engagement was minimal

One commenter expressed that public engagement was nominal and was one-way – from the Trustees to the people. Another commenter expressed that the Trustee Council should have representatives of people from the City of Syracuse – particularly African Americans.

Response: The Trustee Council is comprised of representatives from the Trustee agencies. The City of Syracuse is, by law, not a Trustee. The Trustees do, however, value the opinions and ideas of all people in the City of Syracuse. The Trustees engaged the public on numerous occasions throughout the NRDAR process, requesting input on restoration project ideas via public meetings, a press release, and other media. For additional information on public participation, please see Section 1.7 of the Final RP and the Preamble to the Responsiveness Summary above.

B. Support for the Projects in the Draft Restoration Plan

The Trustees received a large number of comments supporting one or more of the proposed projects. These individual comments are summarized as follows:

- Major accomplishment
- Particularly like grassland habitat
- Pleased to see so much going on
- Great job so far – support grassland and butterfly habitat
- Good future ideas
- Exciting environmental success
- Results look wonderful
- Thanks for open house
- Impressed with ideas at open house – displays and breadth of information
- Favors invasive species fund
- Supports Erie Canal extension
- Support the Gere Lock acquisition
- Thanks to FWS and NYSDEC for improving habitat

- Pleased to see parking and public access at Tully
- USFWS and NYSDEC should be commended for comprehensive list of beneficial projects
- In general, supports what is proposed
- Very much in agreement with plans to restore and create habitat; delighted with turning abandoned parking lot into native grassland; purchasing land is beneficial
- Plan has potential to benefit species like wood thrush, Baltimore oriole, and rose-breasted grosbeak
- Wetland restoration will benefit black ducks, mergansers, ring-necked duck
- Grassland habitat will support bobolink, Northern harrier, Savannah sparrow, and Eastern meadowlark
- Agree whole-heartedly with invasives removal
- Applauds Trustees for RP and supports many aspects
- Support creation of habitat for fish, amphibians, and invertebrates on the lake bottom
- Thanks for projects that benefit priority bird species
- Like local focus of projects and protection of land
- Presentation boards were helpful
- Encouraging to have Onondaga Lake rising to top of assets in CNY
- Support Loop the Lake trail for hiking, cycling, running
- Support trails for cycling and walking
- Supports Tully open access – archery hunting only
- Extremely excited about projects suggested
- Implement trail projects without delay
- Support two trail projects
- Preserve the Gere Lock
- Support grassland restoration
- Commend efforts to restore habitat around Onondaga lake
- Onondaga County Federation of Sportmans Clubs unanimously pass resolution in support of proposed NRDAR projects
- Projects go far and above what our expectations were to compensate public and environment for losses
- Habitat preservation for future is a long-term goal that should be met
- Projects go a long way to restoring, protecting wildlife habitat, and increasing access to lake
- I support projects put here today
- Improved jetty will be safer
- Ninemile Creek improvements beneficial
- We believe projects would be great and we should proceed with them
- Erie Canal project should go ahead
- Thanks for good work in advancing healing of Onondaga Lake
- Recreational trails projects - supported by petition with 206 signatures
- Region 7 Fish & Wildlife Management Board feels that proposed projects go far and above expectations

C. Comments on Assessment Methodology

C1. Provide more information on projects accepted and rejected

A number of commenters requested more information on the projects that are proposed (e.g., acreage, location, which invasive species to be targeted) and those that were submitted as project ideas to the Trustees, but not proposed at this time. One commenter expressed that the lack of project detail makes meaningful comments impossible.

Response: After publication of the Draft Restoration Plan, the Trustees subsequently posted informational posters and a presentation on the USFWS website [https://www.fws.gov/northeast/nyfo/ec/onondaga.htm] that provided additional details on proposed projects. These same project sketches are now presented in Appendix B of the Final RP. An additional column has been added to Exhibits 4-1 and 4-2 that identifies the project proponents (new Exhibit 4-3) for the proposed projects. All proposed projects are conceptual until a settlement is negotiated; therefore, no additional details are available at this time. However, any settlement of this NRD matter will involve the preparation of a Consent Decree that will be similarly subject to public comment. After settlement, additional project details will be developed in the design phase of each restoration project.

Additional detail on project ideas submitted, but not proposed for implementation are now included in Exhibit 4-4, with actual proposals included in Appendix C. Additional project ideas submitted during the public comment period are presented in Appendix D.

C2. Restoration Plan does not address all categories of loss

Several commenters either did not find the draft RP discussion of the assessment methodologies used to assess injury clear or disagreed with the analysis of the Trustees. One commenter felt that the Trustees did not appropriately assess injuries to all resources – particularly air, water, and land. This commenter indicated that air is injured if it is too foul to breathe. The same commenter expressed that the Trustees should conduct an assessment of the complete loss of native fish, including Atlantic salmon. This commenter also suggested that there may be injury to the areas that are now wastebeds because they were formerly wetlands and that the limited private development around the lake signals that the land is not desirable.

Two commenters expressed that the draft RP should address passive use or existence value of the lake to the surrounding community. One commenter expressed that harm to the public must be broadened to include losses beyond recreational losses and that part of the claim should address the deep psychological trauma of poor water. Another commenter expressed that the Trustees should have addressed damages to the entire watershed.

Response: In the Trustees' Assessment Plan, the Trustees recognized that the hazardous waste contamination in Onondaga Lake likely resulted in losses to the public beyond those losses, such as recreational fishing, that can be readily quantified. These non-use or passive use losses are extremely difficult to quantify. In fact, one of the reasons for the Onondaga Nation's withdrawal from the Trustees assessment process, as stated through its attorneys, is that the Nation has been irreparably harmed by the contamination of Onondaga Lake and has come to realize that there is no remedy available through the NRD process that would compensate for its losses. Nevertheless, several projects in the draft RP attempt to re-connect the residents of Onondaga County, including the Onondaga Nation, and the City of Syracuse to the lake, including the Erie Canal Trail Project, the Southwest Shore Project, and the Visitors Center Project. The Visitor Center project in particular has been and will continue to be used to educate school children about the lake and its history. Re-connecting the public to Onondaga Lake is a priority for the Trustees, and it will continue to be an important factor in the selection of future projects in and around the lake. The Trustees assessed damages to all areas that were injured by the releases of hazardous substances, including Onondaga Lake, Ninemile Creek, Onondaga Creek, and Ley Creek (see Chapter 3 of the RP). The entire watershed was not injured by the release of hazardous substances. See also the Response C3 below.

C3. Amount of restoration is not sufficient

Several commenters expressed that there should be more restoration projects, that there should be a "large future project fund of unprecedented scale", that all projects in Alternative C should be funded and that Honeywell is "getting off easy."

Response: The restoration projects were "scaled" against the estimated injury. The Trustees had to prioritize the amount and type of restoration projects to compensate for the injury. The Trustees relied upon the NRDAR regulations at 43 C.F.R. § 11.71(d) that recommend the following for the selection of specific resources, services, and methodologies for injury quantification:

Specific resources or services to quantify and the methodology for doing so should be selected based upon the following factors: (1) Degree to which a particular resource or service is affected by the discharge or release; (2) Degree to which a given resource or service can be used to represent a broad range of related resources or services; (3) Consistency of the measurement with the requirements of the economic methodology to be used; (4) Technical feasibility, as that phrase is used in this part, of quantifying changes in a given resource or service as reasonable cost; and (5) Preliminary estimates of services at the assessment area and control area based on resource inventory techniques.

This natural resource damage assessment used Habitat Equivalency Analysis (HEA) to quantify ecological injury and Benefits Transfer and Random Utility Modeling to quantify lost recreational use. The Trustees weighed estimates of damages for the Site against the cost of conducting even more primary research that would be needed to prove such losses in the context of litigation as well as legal risks associated with such litigation. The Trustees also considered the significant delay in achieving any restoration that would be associated with attempts to litigate in order to potentially collect greater damages. Based on this weighting, it was determined that the selected Alternative B was reasonable and in the best interest of the public.

C4. Restoration Plan does not address past or future loss

One commenter stated that the damage assessment failed to consider past or future ecological losses, particularly future loss with a lack of full remediation.

Response*:* The Trustees assessed past, present, and future injuries, and with respect to ecological losses, assumed that the remedy results in a return to baseline conditions in 2025. These assumptions were based on consideration of remedial projections and quantified both past and future ecological losses. Selection and implementation of a remedy to protect human health and the environment is a separate process under the federal superfund law. See Section 3.3.1 of the RP.

C5. Make original proposals available for review

Copies of the original proposals have been included in Appendix C.

C6. Improved fishing access dominates recreational projects

One commenter expressed that the draft Plan overemphasizes recreational projects, particularly recreational fishing projects. They further suggested that the Trustees should focus on restoration of habitat and natural resources, which will have inherent recreational benefits.

Response: The Trustees selected projects that compensated for both lost ecological and recreational services. In fact, many of the recreational projects provide increased opportunities for activities besides fishing, including biking, wildlife viewing, walking, and education. In summary, the selected Alternative B consists of ten ecological projects and ten recreational fishing projects.

C7. Valuation of loss of potential drinking water source

One commenter believed we should address the loss of a potential drinking water source at Onondaga Lake and use a hedonistic comparison of property values to other regional lakes.

Response: The effects of pollution on private property values is a private cause of action and not recoverable under CERCLA. See response to C8.

C8. Value of collapse of commercial fishery

One commenter expressed that the lake was formerly fished commercially and that this loss should be calculated.

Response: CERCLA does not authorize natural resource trustees to bring claims associated with commercial fishery losses. Rather, the natural resource trustees are authorized to pursue public claims for injury to public natural resources. 42 U.S.C. § 9607(a)(4)(C).

C9. How does RP comply with NYSDEC Habitat Action Plan and Wildlife Action Plan

Response: The projects in the draft RP are consistent with other fish and wildlife resource plans. For example, the placement of additional structures in the lake for fish spawning is an enhancement of work Honeywell was required to perform under the remedial action.

C10. Process for evaluating alternatives is flawed

One commenter expressed that the Trustees created a list of preferred projects and list of non-preferred instead of evaluating a reasonable number of alternative restoration actions.

Response: The Trustees considered many restoration actions, including the No Action alternative. The restoration projects that have been proposed met all the relevant criteria for NRD restoration projects set forth in the RP and at 43 C.F.R. § 11.82(d). The non-preferred projects did not meet these criteria or did not meet these criteria as well as projects in Alternative B. The Trustees identified Alternative B as the preferred alternative because it provides a comprehensive set of restoration alternatives to improve ecological services and recreational services in the Lake watershed. Alternative B includes a suite of projects that will benefit multiple resources and the entire watershed.

C11. Discussion of service losses is inadequate; should use highest service loss and not average

One commenter expressed that the quantification of service losses needs details added, requesting the service loss for every species or guild. They expressed confusion about the habitat loss section and would like to see the results of the HEA. This commenter also believes that habitat loss should be for highest range of service loss – otherwise the species that experiences above-average service loss will not be restored to baseline.

Response: While the Trustees looked at specific species and guilds when assessing ecological injury, quantification of injury during the Cooperative Assessment process with Honeywell required taking a broader look at lake and upland habitat losses. Consistent with NRDAR regulations set forth in 43 C.F.R. Part 11, HEA requires that injury is determined by estimating the service loss to the affected habitat. Assessing service loss to the most sensitive or least sensitive organisms would not reflect habitat service loss in general, i.e., as used by a number of species, and would bias the analysis of habitat loss in one direction or the other. The Trustees performed a HEA at the Site to determine the costs of restoration needed to compensate for natural resource injury due to releases of hazardous substances. The HEA determined that sediment, fish, birds, amphibians, and mammals sustained ecological injuries from those hazardous substances released.

The Trustees determined that hazardous substance concentrations were sufficient to cause a loss in baseline services (i.e., level of services but for contamination) provided by lake area resources such as sediment (macroinvertebrates), fish, amphibians, mammals, and birds. Services losses, based on adverse effects such as reductions in growth, reproduction, and survival were estimated using site-specific and literature-based studies. Exposure and effects information were used to quantify losses to these natural resources. The Trustees used an economic tool called HEA to determine how much restoration is required to compensate for the ecological losses. Specifically, the HEA scales the amount of restoration required to compensate for ecological services caused over time by the release of hazardous substances at the Site. See 43 C.F.R. § 11.83(c)(2).

C12. Spend more money on habitat than recreation

One commenter expressed that more money should be spent on habitat than recreation.

Response: The proposed projects and future project fund provide compensation for the scale of injuries that were found during the assessment process. The amount of habitat or ecological projects versus the amount of recreational projects needs to be scaled to the amount of injuries in those categories.

C13. No information on method for lost recreational trips

One commenter stated that the report does not give any details on the methodology used to assess recreational trips lost.

Response: The final RP includes additional information on the methodologies used. Under applicable legal authorities, Trustees may evaluate injuries starting at the time of release, or in 1981 (with the enactment of CERCLA). The recreational fishing analyses began in 1981 and were projected through 2034, the date when the fishing consumption advisories for mercury are expected to be removed. The Trustees, in the RP/EA, present a recreational fishing analysis applying a service-to-service equivalency approach to establish the scale of restoration required to make the public whole for past and expected future recreational fishing losses. Specifically, the Trustees used a site-specific Random Utility Model (RUM), which utilized an angler count study conducted at the lake and other data from New York lakes on angler site choices to determine how anglers trade off site quality attributes (e.g., catch rates, access conditions, presence of fish consumption advisories [FCAs]) with travel costs. The RUM model was applied to determine the losses in recreational fishing benefits. Using a standard discount rate of 3%, the Trustees estimate 1.2 million present value trips were lost between 1981 and 2034, the date when the FCAs for mercury are expected to be removed.

In addition, the Trustees assessed the sufficiency of the expected benefits from the proposed ten recreational projects to compensate for those trip losses, by developing estimates of the potential number of trips gained from a particular recreational project. This enabled the Trustees to scale losses and gains in the same unit to demonstrate that the public is being compensated for the lost trips by the provision of new similar trip opportunities in the future.

C14. Flawed relationship between harm assessed and restoration proposed

One commenter stated that there was inadequate information on the value of assessed losses and benefits provided by proposed projects so that the public can evaluate whether the draft Plan provides sufficient restoration for the harm done. Another commenter indicated that the list of preferred projects bears no obvious relation to the damage assessment and a third commenter expressed that it is unclear how we interpreted our objectives to restore, replace, rehabilitate, or acquire the equivalent of injured natural resources and natural resource services and there is insufficient information on how we estimated costs, benefits, and unintended consequences of projects.

Response: See Response C1, C3, C11 and C13. Any future consent decree will explain in further detail the value of these projects and a future project fund. The Trustees and Honeywell worked cooperatively to ensure the projects were scaled to the losses. Teams were organized with experts from both sides that are both highly trained in their fields and experienced in NRDAR.

C15. Cost effectiveness is not appropriate selection criterion

One commenter indicated that rejecting project proposals because they are not "cost effective" seems to be an improper consideration for the Trustees. They further commented that these are not public funds and the Trustees are under no obligation to ensure that the projects are financially prudent. Another commenter suggested that the Trustees should consider scaling back a project to create an acceptable proposal.

Response: According to the Department of the Interior NRDAR regulations, 43 C.F.R. § 11.82(d), the selected alternative is to be feasible, safe, **cost-effective**, address injured resources, consider actual and anticipated conditions, have a reasonable likelihood of success, and be consistent with applicable laws and policies. Consideration of cost-effectiveness refers to identifying the least costly alternative among alternatives that provide the same or a comparable level of benefits in the judgement of the Trustees.

C16. Projects should be at arm's length from Trustees

One commenter believes that the Trustees are to act out of the interest of the beneficiaries (i.e. the public).

Response: Natural resource damage claims may be brought exclusively by State and Federal government "trustees" of natural resources, acting on behalf of the public. 42 U.S.C. § 9607(f)(1). See also Response to A5. Consistent with the concept that the government is a Trustee "on behalf of the public," the Trustees must use any recovered funds to replenish the common store of natural resources for public use and enjoyment, which the selected restoration projects achieve.

C17. NRDAR should be more transparent

One commenter expressed that the NRDAR process should be transparent, data driven, participatory, and consensus-based.

Response: The Trustees have invited public participation with respect to developing restoration project ideas and selecting restoration projects. Transparency and public involvement and participation throughout the entire NRDAR process is described in detail in Sections 1.6, 1.7, and 1.8 of the RP and the Preamble of the Responsiveness Summary (Appendix E). It is the Trustees' responsibility to evaluate the public input and make decisions on which restoration projects best compensate for injury and meet the criteria in accordance with federal regulations and laws.

D. Comments related to Onondaga Nation

Concerns were expressed about the involvement of the Onondaga Nation, with a request that their involvement in the assessment be better described. There was concern that

projects submitted by the Nation were eliminated and we failed to take the Onondaga Vision statement more seriously. Comments also included that the draft RP should have discussed lost cultural use or at least presented a qualitative assessment of the losses suffered by the Onondaga Nation or Haudenosaunee Confederacy. A commenter suggested that the Trustees have a fiduciary responsibility to Federally recognized Tribes. One commenter stated that the highest restoration priorities should be set by the Nation and other commenters wanted projects that provide cultural restoration to the Onondaga Nation or return land around the lake to the Onondaga Nation. Another commenter expressed that the Onondaga Nation values and perspectives were ignored.

Response: Text has been added to Section 1.6.1 to clarify the involvement of the Onondaga Nation in the cooperative damage assessment. From at least 2008 until 2015, the Onondaga Nation was fully involved and participated in the NRDAR process. During these seven years, the Onondaga Nation and Federal and State trustees met in person and by phone regularly to discuss technical and legal aspects of injury determination and quantification, resource valuation, as well as initial damage assessment and restoration planning. The NRDAR assessment benefited greatly from their involvement and the Federal and State Trustees were disappointed when, in 2015, the Onondaga Nation elected to withdraw from the cooperative damage assessment. The Nation indicated that they had been irreparably harmed by the contamination of Onondaga Lake and had come to realize that there is no remedy available through the process that would compensate for their losses. The USFWS and NYSDEC presented draft restoration projects to the Onondaga Nation in April and November of 2016 and July of 2017, inviting comments on project proposals and the RP.

The Nation did not submit restoration project ideas as part of the solicitation of project ideas in 2015. However, the NYSDEC and USFWS incorporated restoration project ideas from the Onondaga Nation's Vision for a Clean Onondaga Lake Onondaga Nation (2010) into the proposed projects. Because the Nation withdrew from the damage assessment process, the NYSDEC and the USFWS did not want to mischaracterize or misjudge, even qualitatively, the cultural losses that the Onondaga Nation has sustained as the result of the harm done to Onondaga Lake. Additionally, see Response C2 above.

E. Comments on Proposed Restoration Projects

E1. Boating access and use

One commenter requested that kayak/canoe and motor boat access be separate from each other. Another commenter requested that future lake projects do not affect sailable habitat by removing obstructions close to shore.

Response: There are two separate boat launches that have been proposed. One is proposed along the Seneca River outlet, which is discussed and is part of the draft RP, and the other will be adjacent to the current Honeywell Visitor's Center and is required

pursuant to a separate legal agreement between the NYSDEC and Honeywell. The eventual boat launch adjacent to the Visitor's Center will have a car-top canoe and kayak launch, and there is also a car-top only project at the bottom of Ninemile Creek. The Trustees will ensure that any projects implemented do not adversely impact navigation.

E2. Hunting

One commenter stated that hunting should not be allowed on the properties proposed for protection in the draft RP, and has concerns about incompatibility between hunting and hiking. Another commenter suggested that hunting be allowed on the properties where it can be done safely. A third commenter recommended that archery hunting only be allowed at the Tully property due to possible safety concerns.

Response: As stated previously, these projects are still in the conceptual stage and not yet in the design stage. The full range of uses that will be allowed on these parcels is yet to be determined, and the Trustees acknowledge that at times multiple uses are sometimes desired and are sometimes in conflict. The Trustees shall seek stakeholder input, as appropriate, as these projects are implemented.

E3. Trail Development

A large number of commenters (including one petition with over 200 signatories) expressed support for the trails proposed in the draft RP. Others suggested future funds be used to further extend the Loop the Lake trail. Two commenters recommended that trails around lake should leave room for wetland restoration and habitat and one commenter requested that trails not be built until underlying and adjacent waste is remediated so that it is safe to leave the trail. Several commenters also expressed interest in trails being accessible for wheelchair users, in addition to bicyclists, hikers, and runners. One commenter had suggestions for trail layout. Another commenter was concerned about trail disturbance of roosting bald eagles at the northeastern corner and the threat of roost tree removal along the trail from the Visitor Center to Harbor Brook. One commenter expressed that the Loop the Lake Trail is too close to the lake in places. One commenter expressed that the central piece of the Erie Canal trail on Honeywell property is an extremely significant part of this trail.

Response: The trails will be built in conformity with existing ADA requirements and attempt to match existing Onondaga Park trails as closely as possible. Detailed design of the trail components will be determined at a later date. The Trustees will work with local communities and trail groups to develop trail designs and avoid impacts to wetlands and other important wildlife habitat. We are not proposing any trail work at the northeastern corner of the lake and all trail design will avoid impacts to the bald eagle, pursuant to the Bald and Golden Eagle Protection Act that is administered by the USFWS. It is not within the purview of the Trustees to address the location of already

constructed sections of the Loop the Lake Trail. Safety issues will be addressed in the design phase.

E4. Trash and Parking

One commenter expressed concerns about the adequacy of parking and trash removal at improved recreational amenities such as the jetties.

Response: The Trustees believe that there is already adequate parking available for both the east and west jetty. Trash removal and general maintenance will be provided for upon construction and completion of the projects.

E5. Fish Consumption Advisory Signs

A number of commenters expressed concern that increased fishing access will promote exposure of anglers to contaminated fish. They recommended that signage be provided at all improved fishing access points to advise people about the hazards of eating the fish. Signs should be multilingual, with simple language and graphic warnings. Another commenter expressed that the Trustees should address the issue of fish consumption advisories in the RP.

Response: The Trustees are assuming that the preliminary remediation goals established in the Onondaga Lake Record of Decision (ROD) will be achieved. One goal is to achieve CPOI (chemical parameters of interest) concentrations in fish tissue that are protective of humans and wildlife that consume fish. This includes a mercury concentration of 0.2 mg/kg in fish tissue (fillets) for protection of human health based on the reasonable maximum exposure scenario. The ROD further establishes that additional remedial measures will be implemented in profundal areas that do not achieve the preliminary remediation goals. The Trustees will continue to coordinate with the agencies and communities interested in and responsible for appropriate signage about fish consumption advisories.

E6. Invasive Species

One commenter indicated that one invasive species target should be the immediate control (eradication) of a population of slender false brome grass (Brachypodium sylvaticum spp. sylvaticum), which was discovered in the Harbor Brook watershed area in July of 2013. Another commenter recommended that invasive species to be addressed should be prioritized according to levels of likely impact and success in managing them and that the 15-year management period should be extended to 20-25 years. A commenter wanted more information on which invasive species will be addressed.

Response: The Trustees plan to coordinate with local experts, including local academics, regarding the best approach to invasive species control. While the current

planned project covers a 15-year time frame, monies from the additional project fund could be used on an extended time-frame should that project be a priority over other projects.

E7. Disturbing Cap

One commenter expressed concerns that the structures installed on the lake bottom may disturb the cap or be adversely impacted if the cap slips or breaks.

Response: Structures planned for the Maple Bay area will not be installed on or near the remedial cap. Structures that would be placed in the remedial area shall be the same type of structures approved for use in the Onondaga Lake Bottom Subsite remedy.

E8. Develop timeline for project start and stop

One commenter recommended that despite being early in project development phase, it seems beneficial to develop a timeline for project starts and completions. Another commenter wanted information on the timeline for restoration and verifying success.

Response: Critical milestones and deadlines for each restoration project will be set forth in work plans submitted and approved by the Trustees for each project.

E9. Public Education

Several commenters requested that there be more public education and outreach initiatives as part of proposed restoration projects (e.g., brochures,signs, web page). One commenter requested that there be a greater effort at the Visitor Center and at remediation sites to incorporate more information about lake pollution history. Another commenter suggested that we use restoration funds to develop a school curriculum and encourage community service as part of remediation work, when possible. There is also public interest in keeping informed about future restoration efforts. Two commenters expressed that the Visitor Center should be maintained as an environmental education resource.

Response: As restoration is planned, designed, implemented, and monitored, efforts will be considered to further inform the public on the restoration projects and activities. During the design of the projects, the Trustees will attempt to include brochures or signs to help educate the public on the project and any relevant history. The Visitor Center project in particular will continue to provide educational opportunities to school-aged children and the Trustees will work to transfer the facility to an entity that will focus on environmental protection and education. Furthermore, future projects implemented through the use of the future project fund can continue to make education an important component on future work.

E10. Murphy's Island

One commenter expressed that a confined aquatic disposal cell should be developed on Murphy's Island to be used to accept additional dredged material from Onondaga Lake.

Response: Clean up of mercury (i.e., dredging and disposal of contaminated sediment) is addressed through CERCLA activities led by the NYSDEC and the U.S. Environmental Protection Agency. Project updates will continue to be available via NYSDEC's Onondaga Lake News email list. To sign up, visit www.dec.ny.gov/chemical/52545.html. Questions about progress in and around Onondaga Lake can be directed to Info.R7@dec.ny.gov or call (315) 426-7400 or (518) 402-9676. All project documents are available for review at the NYSDEC Central Office and Region 7 Headquarters. Select documents are also available online at ww.dec.ny.gov/chemical/37558.html.

E11. Concerns about mercury at wastebeds

One commenter expressed concern about developing grassland habitat for birds at mercury-contaminated site, such as Wastebed 13.

Response: The Trustees conducted a study to determine whether mercury or chromium at the wastebeds may pose a risk to birds. We determined that median concentrations of mercury in the blood of song sparrows, red-winged blackbirds, and American robins were below the concentrations expected to adversely affect birds.

E12. Concerns about hardened structures around the lake

One commenter expressed that the RP seems to envision the shoreline as an urban park with large areas of paved parking for visitors who wish to attend concerts, fish, and boat and suggested that the Trustees focus more on native wildlife.

Response: The Trustees are seeking to provide a mixture of human use projects and ecological projects. A goal will be to minimize the impacts of human use structures on habitat. The only new parking area envisioned at the lake would be to provide access for the Visitor Center, SW trail, and deep water fishing pier. The trustees will strive to keep all parking areas to the minimum size needed and to utilize porous pavement technologies and downward facing lights to minimize impacts on birds and other wildlife.

E13. Concerns about effects of human use on fish and wildlife

One commenter expressed concerns about human activities on fish and wildlife and recommended that we create and enforce a "no-wake" zone to protect the southeast shoreline, restrict the use of personal watercraft that discharge raw fuel into the water, install monofilament fishing line recycling stations, and conduct tree removal during non-sensitive times of the year.

Response: The Trustees will observe all appropriate time of year restrictions to protect nesting birds, spawning fish, and roosting bats. Unfortunately, it is outside of the Trustees' authority or capability to place restrictions on boats or maintain monofilament line recycling stations.

F. Comments on Additional Restoration Projects

A large number of commenters proposed additional project suggestions for consideration. The full summary of these proposed projects is provided in Appendix D. Some of these projects, such as boat launches or biking on the Erie Canal Trail, are already proposed in the draft RP. Other projects, such as fish consumption advisory signs and wheel chair accessible trails, will be incorporated into restoration projects, as described above. Projects, such as flood control measures, compensation for private losses or constructing public bathrooms are not appropriate restoration projects under NRDAR because they do not restore, replace, rehabilitate, or acquire the equivalent of resources or resource services that were injured as a result of exposure to hazardous substances. A few types of projects were suggested by more than one commenter. They include:

F1. Mudboil Remediation

Several commenters suggested that the most important use of a future project fund is to alleviate turbidity in Onondaga Creek caused by the mudboils. A commenter believed that there should be consideration of compensating landowners for increased flood insurance, ostensibly caused by increased sedimentation from the mudboils.

Response: The mudboils and the sedimentation of Onondaga Creek caused by the mudboils have been and continue to be water quality issues that affect the Onondaga Nation and Onondaga Lake. However, because such turbidity is not the result of the release of a hazardous substance, its negative impacts were not assessed as part of the injury to Onondaga Lake in this NRDA. Nevertheless, the Trustees could still seek to restore Onondaga Creek or mitigate the mudboils if a demonstrable benefit to Onondaga Creek and Onondaga Lake would result from a project. Unfortunately, many experts, including geologists at the USGS, have not yet identified specific projects that will definitively alleviate the mudboil problem. Additionally, there is other funding that has been available to deal with mudboil problem, and separate funding for projects is a criterion that the Trustees have used to evaluate different restoration projects. Should

someone identify a project that has demonstrable benefits to the water quality of Onondaga Creek and Onondaga Lake that meets all of the other criteria for a priority restoration project, the Trustees could implement that project through the use of the future project fund. With respect to the comment requesting that landowners be compensated for increased flood insurance, these are private as opposed to public harms that are not compensable under CERCLA. See Response C7 above.

F2. Onondaga Creek/Urban Syracuse Corridor

We received a large number of comments (generally form letters) expressing an interest in having restoration projects (re-naturalization, access, flood control) along lower Onondaga Creek in the City of Syracuse. Commenters felt that the southside of Syracuse community and Onondaga Creek were ignored, indicating that this is an environmental justice issue. One commenter acknowledged, that although NRDAR related hazardous wastes were not dumped there, Onondaga Creek had been used as a sewer and restoration projects should be proposed there. Other commenters expressed that the Onondaga Nation has been deprived of the use of Onondaga Creek. One commenter encouraged the Trustee Council to look for opportunities to advance outdoor recreation and environmental education in the City of Syracuse, including extending Loop the Lake and Creek walk, as well as un-channelizing the creek and restoring a more natural steam corridor. Another commenter expressed an interest in fishing piers, canoe/kayak launches, retention basins, and other recreational amenities along Onondaga Creek. The Meadowbrook Retention Basin was given as an example of a positive restoration project. One commenter recommended the designation of funds for urban resiliency projects in Syracuse to include green infrastructure, urban nature preserves, orchards, community gardens, and wetland restoration. Other commenters expressed concerns about flooding along Onondaga Creek and increased flood insurance costs. One commenter expressed that issues with Onondaga Creek should not be the responsibility of this NRDAR process.

Response: The Trustees will be implementing additional projects in the future through the use of the Restoration Project Fund. See Response F1 above. The Trustees will consider restoration projects along Onondaga Creek. The Trustees note that flooding mitigation or alleviation projects are not appropriate projects for use of NRDAR restoration funds because they do not restore, replace, rehabilitate, or acquire the equivalent of resources or resource services that were injured as a result of releases of hazardous substances. See responses to C7 and G2.

F3. Trails

There is strong support for the existing trails, as well as additional trail development, such as continuing the Loop the Lake Trail or the Creek Walk.

Response: See Response E3, F1, and G6.

F4. Cultural Injury projects

A number of commenters recommended projects that provide restoration for impacts to the Onondaga Nation – projects such as designating Haudenosaunee sacred areas, returning land to the Onondaga Nation, planting traditional gardens, and developing educational materials about the Haudenosaunee.

Response: See Response C2, D and F1.

F5. Educational projects

A number of commenters expressed interest in expanded educational programs such as increasing educational signage, advancing outdoor recreation in the City of Syracuse, developing school curriculum, and turning the Visitor Center into a nature center.

Response: See Response E9 and F1.

G. Other Comments

G1. Hazardous conditions at amphitheater

One individual commented that there are hazardous conditions at the amphitheater that may pose a health threat.

Response: NRDAR is not a process that assesses injury to humans or addresses human health. We suggest that the commenter contact the New York State Department of Health.

G2. Need proper cleanup of lake and reduction of mercury in fish

One individual suggested that funds be allocated to reduce mercury levels in fish and another individual wanted more effort spent to "do a proper cleanup of the lake." One commenter felt that the draft RP mischaracterized remediation done around the lake.

Response: See Response C4 and G1 above. Clean up of mercury is addressed through CERCLA activities led by the NYSDEC and the U.S. Environmental Protection Agency. For information about cleanup actions and remediation, see response E10. As set forth in the RP, the goal of the natural resource assessment and restoration process, as outlined in CERCLA at 42 U.S.C. § 9601 et seq., and 43 C.F.R. Part 11, is to plan and implement actions to restore, replace, or rehabilitate the natural resources that were injured or lost as a result of the release of a hazardous substance, or to acquire the equivalent resources or the services they provide. The Trustees are legally bound by statute to use natural resource damage recoveries "**only** to restore, replace, or acquire the equivalent of" the affected natural resources. 42 U.S.C. § 9607(f)(1) (emphasis added). Any restoration projects completed in Onondaga Lake watershed must be related to restoring natural resources that were injured from hazardous substance contamination.

G3. Why isn't Onondaga County a PRP

Response: The Trustees agree that Onondaga County is a potentially responsible party ("PRP") for hazardous substance releases at the Site.

G4. Murphy's Island concerns

One commenter expressed that Murphy's Island should be given to the Onondaga Nation.

Response: The Trustees have not considered any restoration projects associated with Murphy's Island and are not involved with discussions regarding the potential transfer of that property to the Onondaga Nation or any other party.

G5. Reissue Draft plan and not Final plan

One commenter suggested that, due to inadequacies in the draft plan that cannot be addressed by responding to comments, a new draft plan should be issued before a final plan is developed.

Response: As stated in this Responsiveness Summary, the Trustees have made a number of changes to the draft plan based on public comments received, and the plan is now final. Although there will not be further public comments on the RP, there will be additional opportunities for public participation related to restoration efforts. See responses A4 and C1 above.

G6. Handicapped accessible trails and piers

Several commenters expressed an interest in having trails, piers, and other amenities that are accessible to individuals with mobility restrictions.

Response: All proposed recreational projects are required to be ADA-compliant to the extent safety can be reasonably provided with such access.