



Lake Ontario National Marine Sanctuary Final Environmental Impact Statement and Management Plan



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**NATIONAL
MARINE
SANCTUARIES**

Cover photo: Tibbetts Point Lighthouse sits where Lake Ontario meets the St. Lawrence River.
Photo: Matt McIntosh/NOAA



Abstract

The National Oceanic and Atmospheric Administration (NOAA) is proposing to designate the Lake Ontario National Marine Sanctuary to recognize the national significance of the area's historical, archaeological, and cultural resources and to manage this special place as part of the National Marine Sanctuary System. In accordance with the National Environmental Policy Act (NEPA, 42 USC 4321 *et seq.*) and the National Marine Sanctuaries Act (NMSA, 16 USC 1434), NOAA has prepared a final environmental impact statement (EIS) that considers three alternatives for the proposed national marine sanctuary. In this final EIS, NOAA uses criteria and evaluation standards under the regulations implementing NEPA (40 CFR parts 1500–1508 (1978)) and the NOAA implementing procedures for NEPA (NOAA Administrative Order 216-6A) to evaluate the environmental consequences of each alternative.

Under the No Action Alternative, NOAA would not designate a national marine sanctuary in New York. Under Alternative 1, the proposed sanctuary boundary would include 1,786 square miles in eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River. Alternative 1 would incorporate 63 known shipwrecks and one known aircraft. Under Alternative 2, the proposed sanctuary would cover the same 1,722 square mile area in eastern Lake Ontario, but would not include the segment of the St. Lawrence River. Under Alternative 2, the sanctuary would encompass 41 known shipwrecks and one known aircraft. While alternatives 1 and 2 have different geographic boundaries, NOAA proposes to apply the same proposed regulations and management plan to manage sanctuary resources under both alternatives. NOAA's preferred alternative is Alternative 2.

This document also serves as a resource assessment that details the present and future uses of the areas identified for potential national marine sanctuary designation, and it includes a proposed management plan that describes the proposed goals, objectives, and strategies for managing the proposed sanctuary. No significant adverse impacts to biological and physical resources, cultural and historic resources, marine area use, recreation, or socioeconomics are expected under any alternative. Long-term beneficial impacts are anticipated if the proposed action is implemented.

Lead Agency: National Oceanic and Atmospheric Administration

For Further Information Contact: Ellen Brody, Great Lakes Regional Coordinator, email: ellen.brody@noaa.gov



UNITED STATES DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

NATIONAL OCEAN SERVICE

Office of National Marine Sanctuaries

1305 East-West Highway

Silver Spring, Maryland 20910

Dear Reviewer:

In accordance with the National Environmental Policy Act (NEPA), we enclose for your review the National Oceanic and Atmospheric Administration (NOAA) Office of National Marine Sanctuaries (ONMS) final environmental impact statement (EIS) and management plan for the Lake Ontario National Marine Sanctuary.

NOAA prepared this document to assess the environmental impacts of designating a national marine sanctuary under the National Marine Sanctuaries Act (NMSA) in Lake Ontario. The NMSA requires that an EIS be prepared for designation of a national marine sanctuary regardless of the significance of the impacts of the proposed action. The management plan contains the non-regulatory management actions for the sanctuary. NOAA will publish a final rulemaking to establish the boundaries, regulations, and terms of designation for the sanctuary. Under the NMSA, after the publication of the final rule the designation becomes effective after 45 days of Congressional session. During this time, Congress and the Governor of New York will review NOAA's designation documents. NOAA will also develop the record of decision and publish the notice of effective date of the designation in the Federal Register after the review period is complete.

Although NOAA is not required to respond to comments received as a result of issuance of the final EIS, any comments received will be reviewed and considered for their impact on issuance of a record of decision. Please send comments to the Sanctuary Official identified below by 5/20/24. NOAA will make the record of decision publicly available following final agency action.

Responsible official: John Armor, Director
Office of National Marine Sanctuaries

Sanctuary official: Ellen Brody, Great Lakes Regional Coordinator
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4840 South State Road
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Sincerely,



John Armor
Director



About this Document

This final environmental impact statement (EIS) and management plan provide detailed information and analysis of a range of reasonable alternatives for the proposed designation of a new national marine sanctuary in Lake Ontario.

NOAA prepared this final EIS in accordance with the National Environmental Policy Act (NEPA, 42 USC 4321 *et seq.*); NOAA Administrative Order (NAO) 216-6A, which describes NOAA requirements, policies, and procedures for implementing NEPA; and the National Marine Sanctuaries Act (NMSA, 16 USC 1431 *et seq.*), which requires preparation of an environmental impact statement for all sanctuary designations. The Council on Environmental Quality (CEQ) regulations implementing NEPA were revised as of September 14, 2020 (85 FR 43304, July 16, 2020), and were further modified by CEQ's Phase I 2022 revisions (87 FR 23453, April 20, 2022). However, NOAA prepared this final EIS using the 1978 CEQ regulations. NEPA reviews initiated prior to the effective date of the 2020 CEQ regulations may be conducted using the 1978 version of the CEQ regulations. This environmental review began on April 17, 2019, when NOAA published a Notice of Intent to conduct scoping and prepare a draft EIS for designating the proposed sanctuary (80 FR 5699), and the agency has decided to proceed under the 1978 regulations. On June 3, 2023, President Biden signed the Fiscal Responsibility Act (Public Law 118-5), which amended NEPA to provide for more efficient analysis. NOAA has determined that, given the late stage at which the EIS was at the time of the amendment, the most efficient way to complete the NEPA process is to finalize the document in the form in which it was scoped, developed, reviewed, and commented on by NOAA, project proponents, regulators, and the public.

NOAA's April 17, 2019 Notice of Intent initiated the public scoping process. Scoping included a period during which NOAA solicited public comments related to the scale and scope of the proposed sanctuary, including ideas presented in the sanctuary nomination (April 17 to July 31, 2019). NOAA then published a draft EIS and draft management plan on July 7, 2021, and solicited public comment on these documents from July 7 to September 10, 2021 (86 FR 35757). During this comment period, NOAA solicited comments on boundary alternatives, regulatory concepts, and the name of the sanctuary. On January 19, 2023, NOAA then published a notice of proposed rulemaking that identified the preferred boundary, proposed sanctuary regulations, and the terms of designation, and solicited comments from January 19 to March 20, 2023 (88 FR 3334). Together, these documents constituted NOAA's proposal to designate Lake Ontario National Marine Sanctuary (LONMS), which would highlight, manage, and protect underwater cultural and historical resources that possess exceptional historic, archaeological, and recreational value.

NOAA is the lead agency for this proposed action. NOAA's Office of National Marine Sanctuaries (ONMS) would be the implementing office for this proposed action.



Recommended Citation

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Acknowledgements

This document was prepared by NOAA’s Office of National Marine Sanctuaries, with assistance from the New York Department of State; New York Office of Parks, Recreation, and Historic Preservation; New York State Museum; New York Office of General Services; New York Department of Environmental Conservation; and New York Division of Military and Naval Affairs. A full list of preparers is in Appendix E.

Glossary of Acronyms

ARPA	Archaeological Resources Protection Act
AUV	Autonomous Underwater Vehicle
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CZMA	Coastal Zone Management Act
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FR	Federal Register
LONMS	Lake Ontario National Marine Sanctuary
LWD	Low Water Datum
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NMSA	National Marine Sanctuaries Act
NOAA	National Oceanic and Atmospheric Administration
NPRM	Notice of Proposed Rulemaking
NRHP	National Register of Historic Places
NYSDEC	New York State Department of Environmental Conservation
NYSOPRHP	New York Office of Parks, Recreation, and Historic Preservation
ONMS	NOAA Office of National Marine Sanctuaries
ROV	Remotely Operated Vehicle
SMCA	Sunken Military Craft Act
USCG	United States Coast Guard
USV	Uncrewed Surface Vehicle
UUV	Uncrewed Underwater Vehicle

Executive Summary

Introduction

Eastern Lake Ontario is a historically rich area where the long relationship between human activity and the maritime environment has created meaning and a sense of place. An intriguing window into history lies on the shores and bottom of Lake Ontario. The first regional inhabitants, the ancestors of the Haudenosaunee Confederacy, populated the area thousands of years ago. As the gateway between the Great Lakes and the ocean, the maritime landscape of this area represents connections between diverse cultures, between a nascent nation and the frontier, and of commerce, opportunity, and ingenuity. The cultural legacy of people who lived along its shores and journeyed across its waters is showcased by the remains left behind and the stories passed down. Forgotten shipwrecks and archaeological resources, hidden in these cold fresh waters, are among the best preserved in the world, offering a chance to learn, share, and connect to the past.

To help preserve and interpret this rich legacy, the National Oceanic and Atmospheric Administration's (NOAA's) Office of National Marine Sanctuaries (ONMS) proposes to designate a national marine sanctuary in Lake Ontario. Through co-management with the state of New York, NOAA would work to ensure future generations can learn about and explore these underwater treasures above and beneath the waves. In partnership with local communities, NOAA would provide a national stage for promoting heritage tourism and recreation to connect more Americans with this special place.

Sanctuary Nomination

On January 17, 2017, leaders of four counties (Oswego, Jefferson, Cayuga, and Wayne) and the city of Oswego, with support from the governor of New York, submitted a nomination to NOAA asking the agency to consider designating an area in eastern Lake Ontario waters as a national marine sanctuary. The nomination focused on protecting and interpreting a nationally significant collection of 21 historic shipwrecks and one aircraft in a 1,746 square mile area in eastern Lake Ontario. According to the nomination, archival research indicated that an additional 47 shipwrecks and two historic aircraft could be found within the nominated area.

Vessels that historically plied Lake Ontario's waters often met with treacherous conditions, which resulted in numerous shipwrecks. The lake's cold, fresh water preserves these shipwrecks well, creating a "submerged museum" of historic sites with exceptional archaeological, historical, and recreational value. This collection includes *St. Peter* (1873–1898), which is listed on the National Register of Historic Places (NRHP), as well as a 19th century Great Lakes cargo vessel, *David W. Mills*, which is a New York State Submerged Cultural Preserve and Dive Site.

Need for a Sanctuary

The proposed Lake Ontario National Marine Sanctuary (LONMS) sanctuary would provide multiple benefits to the region, including enhanced recreation and tourism, interpretation of the area's rich history, and the long-term protection and management of the area's nationally significant underwater cultural and historical resources (including shipwrecks). Through a management plan and regulations implemented under the National Marine Sanctuaries Act (NMSA), NOAA would study and, where possible, reduce threats to these resources that could adversely affect their historical, archeological, recreational, and educational value. Threats to these nationally significant sites include natural processes (such as impacts of wind, waves, currents, storms, ice, and invasive species, such as zebra and quagga mussels), and human activities (e.g., anchoring, poorly attached mooring lines, artifact disturbance and removal, and gear entanglement).

Public Involvement

An important component of the sanctuary designation and environmental review process includes public involvement. NOAA held three public comment periods throughout the designation process to gather public input on the proposed action.

NOAA also established a Sanctuary Advisory Council to bring members of the local community together to provide advice to NOAA, to serve as a liaison with the nominating community, and to assist in guiding NOAA through the designation process. The council consists of 15 members representing the following seats: citizens-at-large, divers/dive clubs/shipwreck explorers, maritime history, education, tourism, economic development, recreational fishing, and shoreline property owners. In addition, representatives of the four counties, the city of Oswego, the U.S. Coast Guard, the Port of Oswego Authority, New York Sea Grant, and the state of New York are non-voting members.

Proposed Action

In proposing to establish a national marine sanctuary in Lake Ontario, NOAA would:

- Manage the sanctuary as a part of the National Marine Sanctuary System under the National Marine Sanctuaries Act;
- Implement a management plan to provide a comprehensive, long-term plan to manage and interpret the sanctuary;
- Set a boundary to identify these nationally significant shipwrecks and other underwater cultural and historical resources and to interpret the maritime cultural landscape that surrounds them; and
- Implement regulations to prohibit activities that negatively affect underwater cultural and historical resources.

NOAA prepared this final environmental impact statement (EIS) based on the requirements of Section 304 of the National Marine Sanctuaries Act and in accordance with the National Environmental Policy Act. This document describes the affected environment, the proposed

action and alternatives, and the environmental consequences to the human and natural environment of each of the alternatives.

Alternatives

NOAA is evaluating a No Action Alternative and two action alternatives. Under the No Action Alternative, NOAA would not move forward with the designation of the Lake Ontario National Marine Sanctuary.

The two action alternatives include three components: (1) a boundary component, (2) a regulatory component, and (3) a management plan component. NOAA is proposing the same regulations and management plan to manage the sanctuary under both alternatives 1 and 2. NOAA is considering two possible boundaries for the proposed sanctuary. Alternative 1's boundary encompasses a portion of eastern Lake Ontario and a segment of the Thousand Islands region of the St. Lawrence River, while Alternative 2 only encompasses the same portion of eastern Lake Ontario. The same proposed management plan and regulations would apply to both alternatives. NOAA's preferred alternative is Alternative 2.

Boundaries

Under Alternative 1, the proposed sanctuary boundary would include 1,786 square miles in eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River. More specifically, the sanctuary would incorporate 1,724 square miles of eastern Lake Ontario waters and 62 square miles of the St. Lawrence River from the mouth of the river to Chippewa Bay. The sanctuary would border the counties of Wayne, Cayuga, Oswego, and Jefferson and a portion of St. Lawrence County (Figure E.1). Alternative 1 would include a total of one known aircraft and 63 known shipwrecks, including one shipwreck (*St. Peter*) listed on the National Register of Historic Places and another listed as a New York State Submerged Cultural Preserve and Dive Site (*David W. Mills*). Additional underwater cultural and historical resources that may be within the boundaries include approximately 19 potential shipwreck sites (shipwrecks may exist, but additional research is needed to verify and describe these shipwrecks); three aircraft; and several other archaeological sites, including remnants of piers, aids to navigation, historic middens, and historic properties that may be of religious and cultural significance to Indigenous nations and tribes (Table E.1).

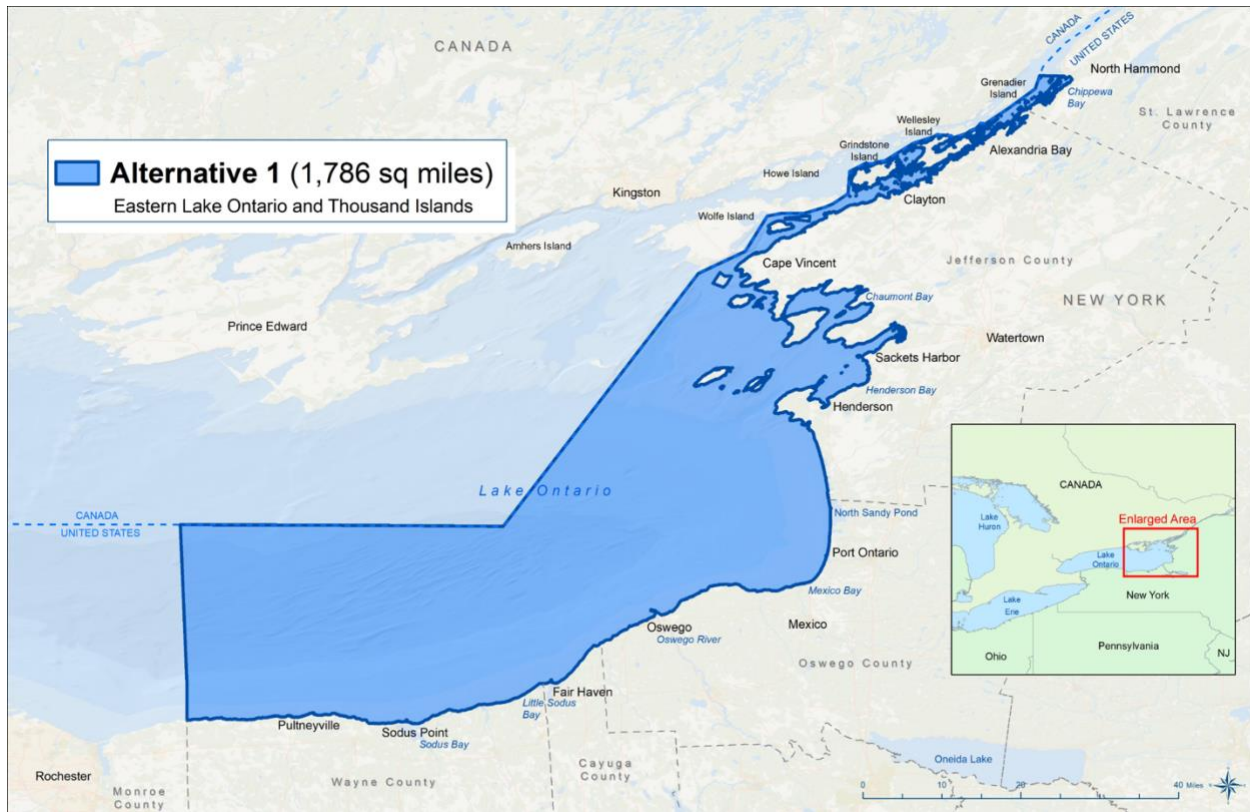


Figure E.1. Geographic boundary of Alternative 1. Image: NOAA

Under Alternative 2, the proposed sanctuary boundary would include 1,722 square miles of eastern Lake Ontario. This area includes the same underwater cultural and historical resources included in Alternative 1 in the eastern Lake Ontario segment but would not include underwater cultural and historical resources in the St. Lawrence River (Figure E.2). Alternative 2 would include a total of one known aircraft and 41 known shipwrecks, including one shipwreck (*St. Peter*) listed on the NRHP and another listed as a New York State Submerged Cultural Preserve and Dive Site (*David W. Mills*). Additional underwater cultural and historical resources that may be within the boundaries include approximately 19 potential shipwreck sites (shipwrecks may exist, but additional research is needed to verify and describe these shipwrecks); three aircraft; and several other underwater archaeological sites, including remnants of piers, aids to navigation, historic middens, and historic properties that may be of religious and cultural significance to Indigenous nations and tribes. NOAA's preferred alternative is Alternative 2.

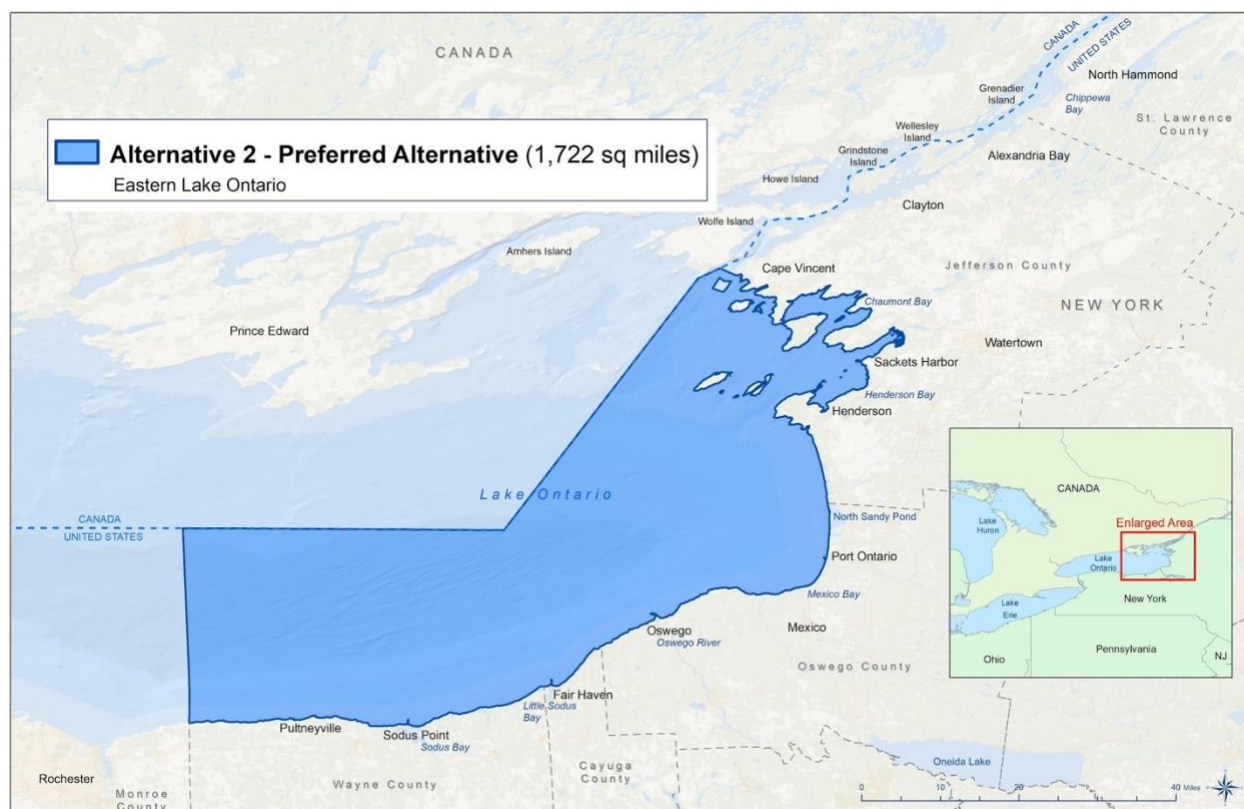


Figure E.2. Geographic boundary of Alternative 2 (Preferred Alternative). Image: NOAA

Table E.1. Number of known and potential shipwrecks and aircraft within the boundaries of Alternative 1 and Alternative 2, which cover part of eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River.

	Known Shipwrecks	Potential Shipwrecks	Known Aircraft	Potential Aircraft
Alternative 1 (1,786 square miles) Eastern Lake Ontario and Thousand Islands	63	19	1	3
Alternative 2 (1,722 square miles) Eastern Lake Ontario	41	19	1	3

Proposed Regulations

NOAA is proposing the following regulations under both alternatives 1 and 2 to manage and protect the underwater cultural and historical resources in the proposed Lake Ontario National Marine Sanctuary:

- Moving, removing, recovering, altering, destroying, possessing or otherwise injuring, or attempting to move, remove, recover, alter, destroy, possess or otherwise injure a sanctuary resource;

- Possessing, selling, offering for sale, purchasing, importing, exporting, exchanging, delivering, carrying, transporting, or shipping by any means any sanctuary resource within or outside of the sanctuary;
- Grappling into or anchoring on shipwreck sites (delayed implementation of two years following sanctuary designation);
- Deploying a tethered underwater mobile system at shipwreck sites; and
- Interfering with, obstructing, delaying, or preventing an investigation, search, seizure or disposition of seized property in connection with enforcement of the Act or any regulation or any permit issued under the Act.

These prohibitions would not apply to any activity necessary to respond to an emergency threatening life, property, or the environment; or to activities necessary for valid law enforcement purposes.

Management Plan

NOAA is proposing to implement the same management plan under both Alternative 1 and Alternative 2. National marine sanctuary management plans fulfill many functions, including outlining staffing and budget needs; setting priorities and performance measures for resource protection, research, and education programs; and guiding development of future budgets and management activities. This plan would chart the course for the proposed sanctuary over the next five to ten years (See Appendix A for the management plan). The Lake Ontario National Marine Sanctuary management plan consists of five action plans:

- **Sanctuary Operations Action Plan:** Create sanctuary infrastructure and program support to ensure effective implementation of the management plan.
- **Research and Monitoring Action Plan:** Conduct research to support resource protection, resource management, and education initiatives.
- **Education and Outreach Action Plan:** Enhance public awareness, understanding, and stewardship of the sanctuary, the Great Lakes, the St. Lawrence River, and the ocean.
- **Tourism and Economic Development Action Plan:** Promote sustainable and community-based tourism and economic development initiatives in Lake Ontario communities in collaboration with communities.
- **Resource Protection Action Plan:** Strengthen resource protection by promoting responsible use of sanctuary resources, developing resource protection-focused outreach, responsible tourism and education initiatives, conducting on-water resource protection activities, and enhancing enforcement efforts.

Summary of Impacts

NOAA evaluated the impacts of its alternatives on underwater cultural and historical resources, human uses and socioeconomic resources, physical resources, and biological resources. The primary underwater cultural and historical resources analyzed in this document are historic shipwrecks. The human uses and socioeconomic resources analyzed are tourism and recreation, commercial activities, military activities, and population statistics. The major physical resources

identified include geology, climate, and water quality. The major biological resources identified include aquatic species, coastal and terrestrial resources, aquatic invasive species, and protected species and their associated habitats.

NOAA's analysis of the potential environmental impacts of each alternative in this final EIS concludes that there would be no significant adverse impacts to biological and physical resources, cultural and historic resources, marine area use, recreation, or socioeconomics under any alternative. NOAA anticipates significant long-term beneficial impacts if the proposed action is implemented.

Chapter 1: Introduction

The National Oceanic and Atmospheric Administration's (NOAA's) Office of National Marine Sanctuaries (ONMS) proposes to designate a national marine sanctuary in New York state waters in eastern Lake Ontario. This final environmental impact statement (EIS) analyzes the environmental impacts of a range of alternatives associated with the proposed sanctuary designation of Lake Ontario National Marine Sanctuary (LONMS). This document is also a resource assessment document that details the present and future uses of the areas identified for potential designation and includes a management plan that describes the proposed goals, objectives, and strategies for managing sanctuary resources.

1.1 National Marine Sanctuary System

NOAA's ONMS serves as the trustee for a network of underwater parks encompassing more than 620,000 square miles of marine and Great Lakes waters from Washington state to the Florida Keys and from New England to American Samoa. The network includes a system of 15 national marine sanctuaries and Papahānaumokuākea and Rose Atoll marine national monuments (see Figure 1.1).

National marine sanctuaries are special areas set aside for long-term protection, conservation, and management and are part of our nation's legacy to future generations. They contain deep ocean habitats of resplendent marine life, kelp forests, coral reefs, whale migration corridors, deep-sea canyons, historically significant shipwrecks, and other important underwater archaeological sites. Each sanctuary is a unique place worthy of special status. Because they serve as natural classrooms, cherished recreational spots, and places for valuable commercial activities, national marine sanctuaries represent many things to many people.

ONMS works with diverse partners and stakeholders to promote responsible, sustainable ocean and Great Lakes uses that ensure the health of our most valued places. A healthy ocean and Great Lakes are also the basis for thriving recreation, tourism, and commercial activities that drive coastal economies.

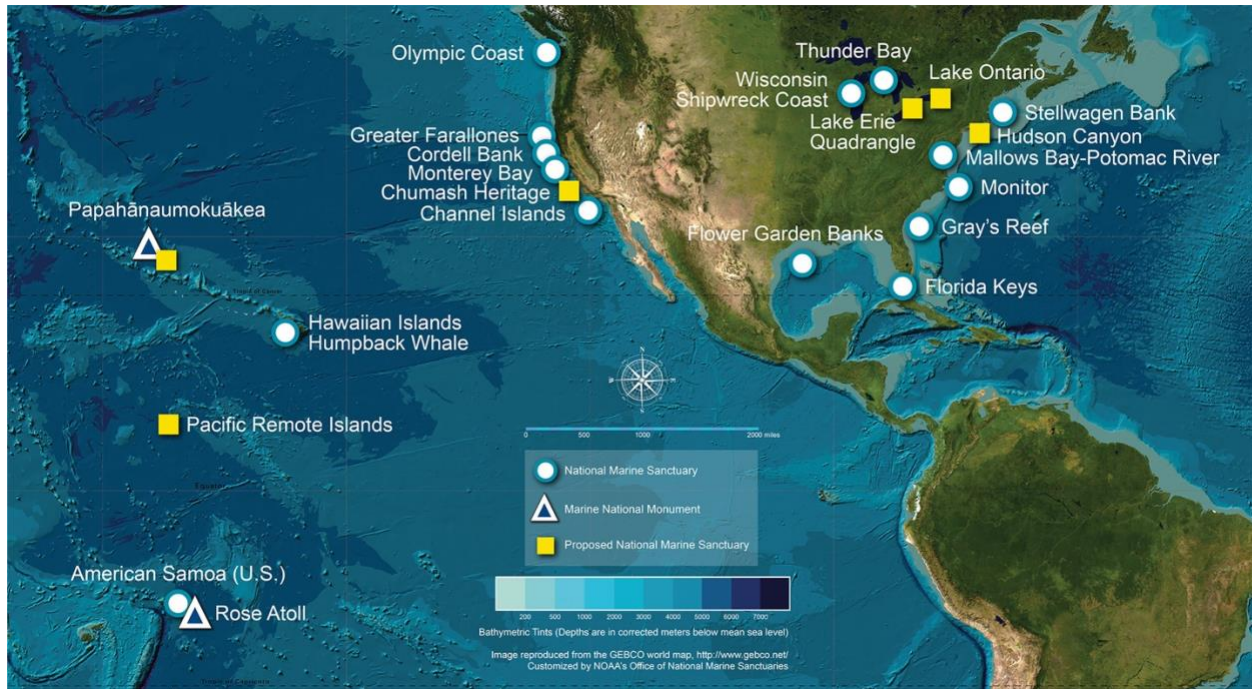


Figure 1.1. The National Marine Sanctuary System. Image: NOAA

1.1.1 National Marine Sanctuaries Act of 1972

The [National Marine Sanctuaries Act](#)¹ (NMSA; formally Title III of the Marine Protection, Research and Sanctuaries Act of 1972, 16 USC 1431 *et seq.*) is the legislation governing the National Marine Sanctuary System. The NMSA authorizes the Secretary of Commerce to identify and designate as a national marine sanctuary any discrete area of the Great Lakes or marine environment that is of special national or in some cases, international significance, and to manage these areas as the National Marine Sanctuary System. An area may be of special national significance due to its conservation, recreational, ecological, historical, scientific, educational, cultural, archaeological, or aesthetic qualities; the communities of living marine resources it harbors; or its resource or human-use values.

National marine sanctuaries may be designated in the areas of coastal and ocean waters, the Great Lakes and their connecting waters, and submerged lands, which the United States exercises jurisdiction over. Day-to-day management of national marine sanctuaries is delegated by the Secretary of Commerce to ONMS.

Congress first passed the NMSA into law in 1972. Since then, Congress amended and reauthorized it in 1980, 1984, 1988, 1992, 1996, and 2000. The overall purposes and policies of the NMSA are to:

- Identify and designate as national marine sanctuaries areas of the marine environment which are of special national significance and to manage these areas as the National Marine Sanctuary System;

¹ <http://sanctuaries.noaa.gov/library/national/nmsa.pdf>

- Provide authority for comprehensive and coordinated conservation and management of these marine areas, and activities affecting them, in a manner which complements existing regulatory authorities;
- Maintain the natural biological communities in the national marine sanctuaries, and to protect, and where appropriate, restore and enhance natural habitats, populations and ecological processes;
- Enhance public awareness, understanding, appreciation and wise and sustainable use of the marine environment, and the natural, historical, cultural, and archeological resources of the National Marine Sanctuary System;
- Support, promote, and coordinate scientific research on, and long-term monitoring of, the resources of these marine areas;
- Facilitate to the extent compatible with the primary objective of resource protection, all public and private uses of the resources of these marine areas not prohibited pursuant to other authorities;
- Develop and implement coordinated plans for the protection and management of these areas with appropriate federal agencies, state and local governments, Native American tribes and organizations,² international organizations, and other public and private interests concerned with the continuing health and resilience of these marine areas;
- Create models for the conservation of managing these areas, including the application of innovative management techniques. These models include creating incentives for new conservation and management ideas; and
- Cooperate with global programs encouraging conservation of marine resources.

1.1.2 Comprehensive Management of the National Marine Sanctuary System

The NMSA includes a finding by Congress that ONMS will “improve the conservation, understanding, management, and wise and sustainable use of marine resources” (16 USC 1431(a)(4)(A)). The NMSA further recognizes that “while the need to control the effects of particular activities has led to enactment of resource-specific legislation, these laws cannot in all cases provide a coordinated and comprehensive approach to the conservation and management of the marine environment” (16 USC 1431(a)(3)). Accordingly, ONMS promotes partnerships among resource management agencies, the scientific community, stakeholders, and the public at-large to comprehensively manage national marine sanctuaries.

1.1.3 Sanctuary Nomination Process

On June 13, 2014, NOAA published a rule (79 FR 33851) to establish a process by which communities may submit applications to have NOAA consider nominations of areas of the marine and Great Lakes environments as national marine sanctuaries. This rule contains the criteria and considerations NOAA uses to evaluate national marine sanctuary nominations, describes the process for submitting national marine sanctuary nominations, and promulgates the regulations necessary to implement this action (see 15 CFR part 922, subpart A). NOAA reviews nominations against the established criteria and either accepts the nomination or

² Terminology from the National Marine Sanctuaries Act

returns it to the community for further development. Nominations describe the area that the community is interested in seeing designated as a national marine sanctuary, including the resources that make the area special and how the community would like to see the area managed.

Once a nomination is accepted by NOAA, it is placed on an inventory of successful nominations that NOAA may consider for designation as a national marine sanctuary. Addition to the inventory does not guarantee that a nominated area will become a national marine sanctuary. National marine sanctuary designation is a separate process, which by law is highly public and participatory and often takes several years to complete. Nominations on the inventory expire after five years if NOAA does not decide to begin a designation process for that area. In November 2019, NOAA established a process to evaluate whether nominations that are approaching this expiration date should remain on the inventory for another five years (84 FR 61546). All [nominations are available online](#).³

1.2 Sanctuary Nomination for the Proposed Lake Ontario National Marine Sanctuary

The LONMS [nomination](#) was submitted to NOAA on January 17, 2017 by leaders of four New York counties (Oswego, Jefferson, Cayuga, and Wayne) and the city of Oswego, with support from the New York governor, acting on behalf of the state of New York.⁴ The nomination focused on acknowledging the national significance of both the submerged cultural resources (21 historic shipwrecks and one aircraft) and the historical context of a 1,746 square mile area in eastern Lake Ontario. The nominators defined the following five goals:

1. To preserve, interpret, and protect the region's and the nation's submerged maritime heritage resources and artifacts within the boundaries of the proposed national marine sanctuary.
2. To expand and enrich regional and international research and educational programs and opportunities for all levels of educational pursuit, from primary school science and history to postgraduate studies and institutional research in marine sciences, maritime history, archaeology, and related disciplines, thereby facilitating the development of future leaders and experts in the many fields related to Great Lakes maritime heritage.
3. To build and strengthen partnerships and collaborations between federal, state, local, Indigenous, and international agencies for implementing best practices in maritime heritage resource management.
4. To pursue and develop strengthened partnerships and co-programming in the areas of tourism, education, and heritage preservation with local, state, regional, national, and international entities.
5. To support, strengthen, and grow the economic and tourism goals of the counties of Jefferson, Oswego, Cayuga, and Wayne, along with the city of Oswego and state of New York; to develop conservation and management strategies for submerged cultural

³ <https://nominate.noaa.gov/nominations/>

⁴ https://nmsnominate.blob.core.windows.net/nominate-prod/media/documents/lake_ontario_nms_nomination_appendix_011717.pdf

resources that are concurrent with, and do not impede, commercial and recreational uses of the waters within the proposed sanctuary.

1.3 Sanctuary Designation and Environmental Review Process

The NMSA authorizes the Secretary of Commerce to identify and designate as a national marine sanctuary any discrete area of the Great Lakes or marine environment that is of special national significance. Section 304(a) of the NMSA describes the sanctuary designation process, including several analyses and activities that provide a basis for the sanctuary designation and opportunity for public participation. The main activities and analyses include the following:

- A notice in the Federal Register of the proposed designation and a summary of the draft management plan
- A resource assessment that describes present and potential uses of the area (Section 4.3)
- A draft management plan for the proposed national marine sanctuary, which is a document that outlines the proposed goals, objectives, and strategies for managing sanctuary resources for the next five years, as described in Section 304(a)(2)(C) of the NMSA (see Appendix A)
- Maps depicting the boundaries of the proposed sanctuary (see sections 3.4.1 and 3.5.1)
- An assessment and basis for why the proposed sanctuary meets the designation standards and factors for consideration, as described in sections 303(a) and 303(b)

In addition, Section 304(a)(2) of the NMSA requires NOAA to prepare an EIS pursuant to the National Environmental Policy Act (NEPA) as part of the sanctuary designation process. NEPA requires that federal agencies include in their decision-making processes appropriate and careful consideration of all environmental effects of proposed actions, and analyze potential environmental effects of proposed actions and their alternatives.⁵ The NEPA process is intended to encourage and facilitate public involvement in decisions that affect the quality of the human environment.

1.3.1 Public Involvement

An important component of the sanctuary designation and environmental review process includes public involvement, as well as coordination and consultations with other federal, state, and local agencies, which are described below.

⁵ The Council on Environmental Quality (CEQ) regulations implementing NEPA were revised as of September 14, 2020 (85 FR 43304, Jul. 16, 2020), and were further modified by CEQ's Phase I 2022 revisions (87 FR 23453, April 20, 2022). However, NEPA reviews initiated prior to the effective date of the 2020 CEQ regulations may be conducted using the 1978 CEQ regulations. This environmental review began on April 17, 2019, when NOAA published a Notice of Intent to conduct scoping and prepare a draft EIS for designating the proposed sanctuary (80 FR 5699), and the agency has decided to proceed under the 1978 regulations. On June 3, 2023, President Biden signed the Fiscal Responsibility Act (Public Law 118-5), which amended NEPA to provide for more efficient analysis. NOAA has determined that, given the late stage at which the EIS was at the time of the amendment, the most efficient way to complete the NEPA process is to finalize the document in the form in which it was scoped, developed, reviewed, and commented on by NOAA, project proponents, regulators, and the public.

1.3.1.1 Scoping

The first step of NOAA's environmental review process for the proposed Lake Ontario sanctuary designation was the issuance on April 17, 2019, of a Notice of Intent to conduct scoping and prepare an EIS (84 FR 16004). Scoping included a 105-day public period during which NOAA solicited public comments related to the scale and scope of the proposed sanctuary, including ideas presented in the sanctuary nomination. In addition, NOAA hosted four public meetings in June 2019 and accepted comments through a web-based portal and by traditional mail until July 31, 2019. All comments received—through any of these formats—are available to the public through [Regulations.gov](https://www.regulations.gov).⁶



Figure 1.2. Public scoping meeting in Watertown, New York, held on June 13, 2019. Photo: NOAA

During the scoping period, 82 individuals provided written input. About 165 people attended the four scoping meetings, with 28 people providing oral comments. In general, comments were strongly supportive of the goals of sanctuary designation, including protecting Lake Ontario's nationally significant shipwrecks, enhancing tourism and the local economy, and fostering education and science programs. A few commenters noted the inaccessibility of many shipwrecks, as well as the accuracy of known and suspected shipwrecks listed in the nomination and Federal Register notice.

Several commenters suggested adding the Thousand Islands region of the St. Lawrence River to the proposed sanctuary boundary, highlighting the large number of shipwrecks in the river, the accessibility of these shipwrecks to divers, and the need to protect them.

⁶ <https://www.regulations.gov/document?D=NOAA-NOS-2019-0032-0001>

1.3.1.2 Public Review of Draft EIS and Draft Management Plan

On July 7, 2021, NOAA published a draft EIS and draft management plan for the proposed sanctuary (86 FR 35757). NOAA did not publish a notice of proposed rulemaking at this time, but the agency did analyze and seek public comment on regulatory concepts for the proposed sanctuary in the draft EIS. During the public comment period on the draft EIS, NOAA received 87 separate comments either through www.regulations.gov, by mail, or during virtual public meetings. All public comments on the proposed designation are [available](#). In general, comments were strongly supportive of sanctuary designation. Commenters cited several reasons for this support, including: long-term protection for nationally significant shipwrecks; increased accessibility to these wrecks; potential for national recognition of the area to support local tourism and economies; federal resources to support research on shipwrecks; establishing a mooring program; and potential educational opportunities for students to study cultural and biological resources in the lake. Local and state governments and organizations also expressed strong support of the proposed sanctuary, offering opportunities to partner for education, research, outreach, and other activities. New York state agencies expressed commitment to be key partners in co-management and implementation of the proposed national marine sanctuary. The Lake Ontario National Marine Sanctuary Advisory Council unanimously passed a resolution with comments on the draft EIS, including a preference for including the Thousand Islands Region of the St. Lawrence River, as long as it would not adversely impact commercial shipping.

Several commenters were supportive of designating the proposed Lake Ontario National Marine Sanctuary, but expressed concern about potential safety issues and navigational challenges in the St. Lawrence Seaway shipping channel, if designation led to an increase in the number of divers and other recreational users. Some commenters also noted that installing surface mooring buoys in navigation channels would create a navigation hazard for vessels and asked NOAA to consider excluding navigation structures and dredge disposal sites from the proposed sanctuary. Other commenters expressed concern that there is not enough public interest in local shipwrecks; the shipwrecks are already adequately protected by other laws; most of the wrecks have already been found by private explorers (and, thus, NOAA research was not needed); and that the level of economic development would not be high enough to justify the creation of a national marine sanctuary in the area.

NOAA received a few comments specific to the LONMS boundary proposals. The majority of these comments supported the larger boundary option that includes the Thousand Islands region of the St. Lawrence River. A few commenters supported the boundary option that only includes eastern Lake Ontario.

1.3.1.3 Public Review of Proposed Rulemaking

In accordance with the NMSA (16 USC § 1434), NOAA prepared and released a notice of proposed rulemaking (NPRM) for the proposed designation (88 FR 3334, January 19, 2023). In response to concerns raised in public comments on the draft EIS, NOAA moved forward with proposing Alternative 2 with slight modifications to the boundary from the draft EIS as the official proposed sanctuary for the notice of proposed rulemaking. The proposal included 1,724 square miles of eastern Lake Ontario waters. NOAA solicited public comment on the proposed rule from January 19, 2023 to March 20, 2023. NOAA accepted comments in the form of letters

and written comments through electronic submissions to www.regulations.gov, letters submitted by mail, and both in-person and virtual public hearings. NOAA received 96 comments during the public comment period on the notice of proposed rulemaking. All public comments on the proposed designation are [available](#).

Again, commenters were strongly supportive of designating the sanctuary. Commenters cited several reasons for support including: long-term protection for nationally significant shipwrecks; increased accessibility to these shipwrecks; additional recreational opportunities; potential for national recognition of the area to support local tourism and economies; federal resources to support research on shipwrecks; establishing a mooring program; and potential educational opportunities for students to study cultural and biological resources in the lake. Commenters opposing sanctuary designation cited reasons including: enough state and federal protections for sensitive historic underwater resources already exist; concern that there is not enough public interest in local shipwrecks; most of the wrecks have already been found by private explorers and, thus, NOAA research is not needed; and the sanctuary would be a waste of federal funding. Some commenters expressed conditional support for a sanctuary as long as legal fishing, hunting, and fur trapping activities are not limited by the sanctuary.

Other commenters sought clarity on different aspects of the sanctuary boundary, as well as on the proposed sanctuary's impacts to dredging, construction and maintenance of shoreline infrastructure (e.g., piers), and wind energy development in Lake Ontario. Several commenters supported NOAA's decision to move forward with the proposed sanctuary including eastern Lake Ontario only, although they recommended moving the eastern edge of the boundary further west because the proposed boundary still included about 2.5 miles of the St. Lawrence River. Some commenters still supported including a portion of the St. Lawrence River in the sanctuary to protect shipwrecks there. NOAA also received comments on the proposed regulations and definitions, as well as corrections to the names, locations, and number of known shipwrecks within the proposed boundaries.

NOAA analyzed all comments received during this process and considered them in preparation of this final EIS. NOAA's response to comments received on the draft EIS and NPRM are included in Appendix D.

1.3.1.4 Sanctuary Advisory Council

In February 2020, NOAA established a Sanctuary Advisory Council to bring members of the local community together to provide advice to NOAA, to serve as a liaison with the nominating community, and to assist in guiding NOAA through the designation process. The council consists of 15 voting members representing the following seats: citizens-at-large, divers/dive clubs/shipwreck explorers, maritime history, education, tourism, economic development, recreational fishing, and shoreline property owners. In addition, representatives of the four counties, the city of Oswego, the U.S. Coast Guard, the Port of Oswego Authority, New York Sea Grant, and the state of New York are non-voting members. The Sanctuary Advisory Council has met on average five times per year. The Sanctuary Advisory Council wrote a first draft of the draft management plan for NOAA's review, organized a lecture series on topics related to the sanctuary, and set up several working groups on sanctuary priorities and communications.

1.3.2 Consultations

In addition to NEPA, NOAA is required to consult with various agencies to comply with several related statutes, regulations, and executive orders (EO) as part of this federal action (see Appendix B for additional information).

1.3.2.1 National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA, 54 USC 306108) requires federal agencies to consider the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation an opportunity to comment. “Historic property” means any prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in the NRHP maintained by the Secretary of the Interior. This term includes artifacts, records, and material remains that are related to and located within such properties, including properties of traditional religious and cultural importance to an Indigenous nation or tribe or Native Hawaiian organization. The regulations implementing Section 106 of the NHPA (36 CFR 800) guide federal agencies in meeting this responsibility through a process to identify historic properties potentially affected by the undertaking, assess its effects, and seek ways to avoid, minimize, or mitigate any adverse effects on historic properties, all of which occur in consultation with interested parties.

NOAA has determined that although the proposed designation of Lake Ontario National Marine Sanctuary and related rulemaking for sanctuary-specific regulations meet the definition of an undertaking as defined at 800.16(y), these activities are not of the type that have the potential to cause effects on historic properties, and therefore NOAA has no further obligations under Section 106, per 800.3(a)(1). NOAA, however, recognizes that designation of the proposed sanctuary will lead to subsequent activities that may constitute undertakings subject to Section 106 review under the NHPA and therefore NOAA is pursuing execution of a Programmatic Agreement (PA) pursuant to 36 CFR 800.14(b). The PA will provide a framework and process for consideration of future undertakings resulting from management of the sanctuary, associated field operations, and other activities, if the sanctuary were designated. NOAA is developing this agreement in consultation with the New York State Historic Preservation Officer and the Advisory Council on Historic Preservation, with the Onondaga Nation participating as a consulting party.

1.3.2.2 Executive Order 13175: Consultation and Coordination with Indian Tribal Governments

Under Executive Order 13175 of November 6, 2000, federal departments and agencies are charged with engaging in regular and meaningful consultation and collaboration with officials of federally-recognized nations and tribes on the development of federal policies that have implications for Indigenous peoples and are responsible for strengthening the government-to-government relationship between the United States and Indian nations and tribes. NOAA has concluded that this regulatory action does have tribal implications under Executive Order 13175.

NOAA invited the following federally recognized nations and tribes to engage in government-to-government consultation on the proposed sanctuary designation: Cayuga Nation, Oneida Nation, Onondaga Nation, Seneca Nation of Indians, Saint Regis Mohawk Tribe, Tonawanda

Seneca Nation, and Tuscarora Nation. NOAA sent initial letters inviting the seven nations and tribes to participate in government-to-government consultation prior to publication of the Notice of Intent (December 14, 2018). NOAA later sent notices of the draft environmental impact statement publication (July 8, 2021) and the notice of proposed rulemaking (January 19, 2023) to the same nations and tribes. The Onondaga Nation elected to engage in government-to-consultation with NOAA, and the initial government-to-government consultation meeting with the Onondaga Nation was held on July 30, 2020. NOAA concluded government-to-government consultation with the Onondaga Nation (December 19, 2023 letter). The Seneca Nation of Indians chose to informally engage with NOAA throughout the designation process instead of participating in formal government-to-government consultation.

The seven federally recognized nations and tribes have the opportunity at any point to participate in the designation process, including a request to initiate formal government-to-government consultation with NOAA. NOAA has also invited the seven federally recognized nations and tribes to participate in the development of a Programmatic Agreement to fulfill NOAA's obligations under section 106 of the NHPA (see Section 1.3.2.1). Upon designation, NOAA will offer consultation to federally recognized nations and tribes on any sanctuary action that may have tribal implications as described in E.O. 13175, including those actions that might affect the ability of nation or tribal citizens to participate in activities protected by the 1794 Treaty of Canandaigua.

1.3.2.3 Coastal Zone Management Act

In 1972, Congress enacted the Coastal Zone Management Act (CZMA, 16 USC 1451 *et seq.*) to encourage coastal states, Great Lake states, and U.S. Territories and Commonwealths to preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone. Section 307 of the CZMA is known as the "federal consistency" provision. The federal consistency provision requires federal actions (inside or outside a state's coastal zone) that affect any land or water use or natural resource of a state's coastal zone, to be consistent with the enforceable policies of the state coastal management program. The term "effect on any coastal use or resource" means any reasonably foreseeable effect on any coastal use or resource resulting from the activity, including direct and indirect (cumulative and secondary) effects (15 CFR 930.11(g)). The federal consistency regulations can be found at 15 CFR part 930.

NOAA worked with the state of New York on developing the range of alternatives in this EIS because it takes place wholly within New York state waters. When NOAA published the NPRM, NOAA prepared a consistency determination and sent a letter to the New York Coastal Management Program to request the state's concurrence with the determination. The New York Coastal Management Program concurred with NOAA's consistency determination on April 7, 2023 (see Appendix B.6 for correspondence regarding the consistency determination).

1.3.3 Revisions from the Draft EIS to the Final EIS

In preparing this final EIS, NOAA evaluated and considered all public and agency comments received on the draft EIS and NPRM. NOAA incorporated the following changes into this final EIS, consistent with modifications made to the proposed action, and other clarifications

requested by comments on the draft EIS and NPRM. For changes made in response to public comments, NOAA's complete responses to public comments can be found in Appendix D. NOAA also consulted with the state of New York regarding revisions between the draft EIS and final EIS.

Table 1.1. Summary of revisions from the draft environmental impact statement to the final environmental impact statement.

EIS Element	Draft Environmental Impact Statement	Changes in the Final Environmental Impact Statement
Public Review Process Description	NOAA included information about the public review processes for the scoping stage of the designation process.	NOAA added information about the public review processes for the draft environmental impact statement and the notice of proposed rulemaking stages of the designation process.
Consultations	NOAA listed the consultations the agency is required to conduct for the proposed action.	NOAA updated the consultations section, including the Coastal Zone Management Act section and the Executive Order 13175: Consultation and Coordination with Indian Tribal Governments.
Selection of Preferred Alternative	NOAA did not select a preferred alternative.	NOAA selected Alternative 2 as the preferred alternative (eastern Lake Ontario only (1,722 square miles)).

EIS Element	Draft Environmental Impact Statement	Changes in the Final Environmental Impact Statement
Boundary Specifications	<ul style="list-style-type: none"> - NOAA referenced the Low Water Datum and the 1985 International Great Lakes Datum in its description of setting the shoreline boundaries of alternatives 1 and 2. - The eastern extent of the boundary for Alternative 2 extended from the town of Cape Vincent, New York to the Canadian border. - Alternative 2 covered 1,724 square miles. - NOAA proposed to exclude the ports and harbors of Oswego, Pultneyville, Little Sodus, Great Sodus, and Port Ontario but not Cape Vincent or Sackets Harbor. - NOAA included designated open water dredge disposal areas in the list of excluded areas. 	<ul style="list-style-type: none"> - NOAA added language to the description of the Low Water Datum and the 1985 International Great Lakes water datum to clarify that the boundary would reflect any updates to either datum made in the future. - In response to public comment on the proposed rule, NOAA shifted the proposed eastern boundary of Alternative 2 so that it ends westward of the border proposed in the draft EIS and now extends from Tibbetts Point lighthouse to the Canadian border. Therefore, Cape Vincent's marina is no longer within the boundary of Alternative 2. Sackets Harbor is still within the boundaries for alternatives 1 and 2. Alternative 2 now covers 1,722 square miles instead of 1,724 square miles due to these changes. - NOAA amended the list of excluded ports and harbors to include Oswego, Pultneyville, Little Sodus Bay, Sodus Bay, and Port Ontario. NOAA changed the name from "Great Sodus Bay" to "Sodus Bay" and "Little Sodus" to "Little Sodus Bay" in the list of ports and harbors it proposes to exclude from the sanctuary. - NOAA amended the boundary coordinates and added language to clarify that East Bay, Port Bay, Blind Sodus Bay, North Pond, South Colwell Pond, Goose Pond, Floodwood Pond, and Black Pond are not included within the proposed boundaries for either alternative. - NOAA removed designated open water dredge disposal areas from the list of excluded areas, which does not change the existing management or use of those areas.

EIS Element	Draft Environmental Impact Statement	Changes in the Final Environmental Impact Statement
Regulations	<p>- NOAA proposed the following regulatory concepts to prohibit the following activities:</p> <ul style="list-style-type: none"> • Damage/injury to underwater cultural and historical resources • Use of anchors and grappling hooks at shipwreck sites • Use of tethered systems (such as remotely operated vehicles) at shipwreck sites without a permit • Possession and sale of artifacts 	<p>- NOAA took the proposed regulatory concepts from the draft EIS and developed proposed regulations, which the agency published in a notice of proposed rulemaking. NOAA also added a prohibition against interfering with federal investigations. NOAA's final EIS reflects these proposed regulations.</p> <p>NOAA's proposed regulations:</p> <ul style="list-style-type: none"> • Moving, removing, recovering, altering, destroying, possessing, or otherwise injuring, or attempting to move, remove, recover, alter, destroy, possess, or otherwise injure a sanctuary resource; • Possessing, selling, offering for sale, purchasing, importing, exporting, exchanging, delivering, carrying, transporting, or shipping by any means any sanctuary resource within or outside of the sanctuary; • Grappling into or anchoring on shipwreck sites; • Deploying a tethered underwater mobile system at shipwreck sites; • Interfering with, obstructing, delaying or preventing an investigation, search, seizure, or disposition of seized property in connection with enforcement of the act or any regulation or any permit issued under the act. <p>- The regulations expressed in the final EIS reflect changes made in response to public comment on the notice of proposed rulemaking. For example, based on public comment, NOAA proposed a two-year delay in implementing the prohibition on grappling into or anchoring on shipwreck sites and added explanatory text about the need for the delay.</p>

EIS Element	Draft Environmental Impact Statement	Changes in the Final Environmental Impact Statement
Definitions	<p>NOAA proposed the following definitions to clarify how the regulations would apply in the proposed sanctuary:</p> <ul style="list-style-type: none"> • “Sanctuary resource” would be defined as: all prehistoric, historic, archaeological, and cultural sites and artifacts within the sanctuary boundary, including all shipwreck sites. This includes any historic sunken craft, its components, cargo, contents, and associated debris field. • “Tethered system” would be defined as: remotely operated vehicles (ROVs), drop cameras, and other submersibles that are connected directly to a station-holding surface support craft by means of a tether/umbilical. The term “tethered systems” in this definition does not include towed systems, such as side-scan sonar, magnetometers, survey trawls, or other survey instruments that are pulled behind a vessel via a tow cable. 	<p>NOAA added or modified the following definitions to clarify how the regulations would apply in the proposed sanctuary:</p> <ul style="list-style-type: none"> • “Sanctuary resource” means all historical resources as defined at 15 CFR 922.3, which includes any pre-contact and historic sites, structures, districts, objects, and shipwreck sites within sanctuary boundaries. • “Shipwreck site” was added as a defined term, to mean all archaeological and material remains associated with sunken watercraft or aircraft that are historical resources, including associated components, cargo, contents, artifacts, or debris fields that may be exposed or buried within the lakebed. • “Tethered system” was changed to “Tethered underwater mobile system,” and now refers to remotely operated vehicles and other systems with onboard propulsion systems that utilize a tether connected to a station-holding (e.g., by anchor, dynamic positioning, or manual vessel operation) surface support vessel
Special Use Permit	NOAA includes a description of the Office of National Marine Sanctuaries’ special use permits.	NOAA added a proposed new special use permit category for “the operation of tethered underwater mobile systems at shipwreck sites in Lake Ontario National Marine Sanctuary” to apply when the proposed activity does not qualify for a general permit or authorization, as described above.

EIS Element	Draft Environmental Impact Statement	Changes in the Final Environmental Impact Statement
Management Plan	<p>NOAA included an introduction and proposed strategies and activities for the following action plans: Sanctuary Operations; Education and Outreach; Research and Monitoring; Tourism and Economic Development; and Resource Protection. The plan concluded with an outline of a budget.</p>	<ul style="list-style-type: none"> - NOAA revised the introduction to include more information about the sanctuary, the purpose of the management plan, and the roles for NOAA, the state of New York, and the Sanctuary Advisory Council. - NOAA expanded some of the action plans to include activities that focus on working with partners on digital immersive experiences and other outreach opportunities; including partners to help determine the level of and type of visitor uses; and using side scan multi-beam sonar to map sanctuary resources. - NOAA added several new activities to address climate change, including considering how resource protection and management may need to evolve in response to climate change, as well as expanding education and outreach to include climate change impacts in the Great Lakes and possible impacts to sanctuary resources. - NOAA revised the funding section to be consistent with other new sanctuaries.

EIS Element	Draft Environmental Impact Statement	Changes in the Final Environmental Impact Statement
Number of Known and Potential Shipwrecks and Aircraft	<p>NOAA included the number of known and potential shipwrecks based on its research (see Section 3.3.1.1 for more details on research methods). Under the number of known shipwrecks in</p> <ul style="list-style-type: none"> Alternative 1: 64 known shipwrecks (43 in Eastern Lake Ontario and 21 in the Thousand Islands Region); 20 potential shipwrecks (20 in Eastern Lake Ontario and none in the Thousand Islands Region); 1 known aircraft (1 in Eastern Lake Ontario and none in the Thousand Islands Region); 3 potential aircraft (3 in Eastern Lake Ontario and none in the Thousand Islands Region) Alternative 2: 43 known shipwrecks; 20 potential shipwrecks; 1 known aircraft; 3 potential aircraft 	<p>- NOAA updated the numbers of known and potential shipwrecks within the proposed sanctuary based on new information it received on shipwrecks in the area. This information will continue to be updated after sanctuary designation.</p> <ul style="list-style-type: none"> Alternative 1: 63 known shipwrecks (41 in Eastern Lake Ontario and 22 in the Thousand Islands Region); 19 potential shipwrecks (19 in Eastern Lake Ontario and none in the Thousand Islands Region); 1 known aircraft (1 in Eastern Lake Ontario and none in the Thousand Islands Region); 3 potential aircraft (3 in Eastern Lake Ontario and none in the Thousand Islands Region) Alternative 2: 41 known shipwrecks; 19 potential shipwrecks; 1 known aircraft; 3 potential aircraft <p>- NOAA removed the wreck of <i>Congercoal</i> from the list of known shipwrecks upon receiving further clarification on its position. NOAA also removed <i>Jefferson</i> as it is on private property in a marina (See Table 4.1).</p> <p>- Based on new information, NOAA added names to shipwrecks that had not been identified in the draft EIS.</p> <p>- “Old Schooner” was identified as the wreck of <i>Napoleon</i>. Therefore, NOAA removed <i>Napoleon</i> from the list of potential wrecks in eastern Lake Ontario and corrected “Old Schooner” to <i>Napoleon</i> in the list of known wrecks in eastern Lake Ontario (see Tables 4.1 and 4.3).</p> <p>- NOAA edited the name of the wreck of <i>Lady Washington</i> to <i>Washington</i>.</p>

EIS Element	Draft Environmental Impact Statement	Changes in the Final Environmental Impact Statement
Climate Change	NOAA described the current climate in the Climate section of Physical Resources in Chapter 4.	<ul style="list-style-type: none"> - NOAA added information on climate change in the Great Lakes to the Climate section of Physical Resources in Chapter 4. - NOAA added new activities to the Sanctuary Operations, Education and Outreach, and Resource Protection action plans in the management plan.
Impact to Commercial Shipping	NOAA determined that Alternative 1 and Alternative 2 would have no impact on commercial shipping.	NOAA revised the impact determination for Alternative 1 from “no impact” to “negligible adverse impacts” to commercial shipping.
Summary Table of Environmental Consequences	---	NOAA added a summary table of the environmental consequences of the three alternatives to Chapter 5.
Technical Edits	---	NOAA made spelling and grammar edits throughout the document and updated reference numbers to other sections. NOAA also made technical edits to the proposed regulations to conform with revisions to 15 CFR Part 922 (see 88 FR 19824, Apr. 4, 2023).

These changes do not result in a substantial change to the proposed action that are relevant to environmental concerns or impacts. The impacts of the changed proposed boundary are within the range of impacts of the alternatives analyzed in the draft EIS, and the proposed regulations are consistent with the regulatory concepts that were analyzed in the draft EIS. Therefore, there is no need to issue a supplemental EIS.

1.4 Scope of the Environmental Review

This final EIS analyzes and summarizes the environmental consequences of the proposed action and alternatives. The alternatives include proposed sanctuary boundaries, proposed regulations, and a sanctuary management plan to support the management and protection of the proposed sanctuary's resources. The geographic scope of the affected environment in Chapter 4 and analysis of environmental consequences in Chapter 5 encompasses eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River.

Additionally, NOAA would implement non-regulatory actions as described in the proposed Lake Ontario National Marine Sanctuary management plan (Appendix A). The management plan outlines a series of management goals and strategies in the areas of research and monitoring, education and outreach, tourism and economic development, sanctuary resource protection, and sanctuary operations.

Some sanctuary management activities that may occur within the proposed sanctuary, including issuance of permits, are outside the scope of this final EIS, as NOAA does not have sufficient information regarding these projects at this time to conduct a meaningful analysis. When more details become available about these activities or when new activities arise, NOAA will assess whether their effects are adequately described in this final EIS. If they are not, NOAA will conduct additional environmental reviews and develop independent environmental compliance and consultation documentation, as needed. For each permit application received, NOAA would evaluate all environmental compliance requirements at that time, including compliance with NEPA and other environmental statutes (e.g., Endangered Species Act, Coastal Zone Management Act, and National Historic Preservation Act).

1.5 Organization of this Final Environmental Impact Statement

This final EIS is organized as follows:

Chapter 1: Provides background on the National Marine Sanctuary System, the sanctuary nomination for Lake Ontario, and the sanctuary designation and environmental review processes under NMSA and NEPA.

Chapter 2: Outlines the purpose and need for the proposed designation of a national marine sanctuary in Lake Ontario.

Chapter 3: Describes the process to develop alternatives. Identifies the no action alternative, the two action alternatives, and the alternatives considered but eliminated from detailed evaluation. For each alternative, Chapter 3 describes the proposed boundary, regulations, and management plan.

Chapter 4: Describes the environment affected by the proposed sanctuary designation, including an overview of underwater cultural and historic resources, the cultural maritime landscape, and human uses within the proposed sanctuary.

Chapter 5: Provides an analysis of the potential environmental consequences of each alternative and compares the environmental consequences across alternatives.

Chapter 6: Describes the unavoidable adverse impacts, the relationship of short-term and long-term productivity, and irreversible or irretrievable commitment of resources associated with the alternatives, per the requirements of NEPA.

Chapter 2: Purpose and Need for Action

2.1 Purpose of the Proposed Action

The purpose of the proposed action is to designate a national marine sanctuary in New York state waters in eastern Lake Ontario. NOAA proposes to designate Lake Ontario National Marine Sanctuary to recognize the national significance of the area's historical, archaeological, and cultural resources and to manage this special place as part of the National Marine Sanctuary System.

Establishing a national marine sanctuary in Lake Ontario would: (a) allow NOAA to complement and supplement existing state and federal efforts to protect underwater cultural and historical resources and actively manage, study, and interpret them for the public; (b) through outreach and communication, recognize and promote this area's nationally significant historical and cultural properties; (c) provide access to NOAA's extended network of scientific expertise and technological resources, enhance ongoing research, and provide an umbrella for the coordination of these activities; (d) create and build upon existing educational initiatives and provide programming and technology for students, teachers, and the general public across the country; (e) enhance and facilitate public stewardship of underwater cultural and historical resources; and (f) bolster broader lake conservation efforts and stimulate maritime heritage-related tourism in the many communities that have embraced their centuries-long relationship with Lake Ontario, the St. Lawrence River, the Great Lakes region, and the Nation. NOAA would co-manage the sanctuary with the state of New York.

The proposed designation of a national marine sanctuary in Lake Ontario would fulfill the purposes and policies of the NMSA, including:

- (1) “to identify and designate as national marine sanctuaries areas of the marine environment which are of special national significance and to manage these areas as the National Marine Sanctuary System” (16 USC 1431(b)(1));
- (2) “to provide authority for comprehensive and coordinated conservation and management of these marine areas, and activities affecting them, in a manner which complements existing regulatory authorities” (16 USC 1431(b)(2));
- (3) “to enhance public awareness, understanding, appreciation, and wise and sustainable use of the marine environment, and the...historical, cultural, and archaeological resources of the National Marine Sanctuary System” (16 USC 1431(b)(4));
- (4) “to support, promote, and coordinate scientific research on, and long-term monitoring of, the resources of these marine areas” (16 USC (b)(5));
- (5) “to facilitate to the extent compatible with the primary objective of resource protection, all public and private uses of the resources of these marine areas not prohibited pursuant to other authorities” (16 USC 1431(b)(6)); and

(6) “to develop and implement coordinated plans for the protection and management of these areas with appropriate Federal agencies, State and local governments, Native American tribes and organizations,⁷ international organizations, and other public and private interests concerned with the continuing health and resilience of these marine areas” (16 USC 1431(b)(7)).

2.2 Need for the Proposed Action

The nationally significant underwater cultural and historical resources within the proposed sanctuary require long-term protection and management to reduce threats that would adversely affect their historical, cultural, archaeological, recreational, and educational value. These threats include both natural processes and human activities. Natural processes include the damaging impacts of wind, waves, currents, storms, ice, and invasive species (e.g., zebra and quagga mussels, which currently cover many Lake Ontario shipwrecks). Human threats include anchor damage from dive boats, damage due to poorly attached mooring lines, artifact disturbance and removal, remotely operated vehicle (ROV) tethers entangled within a shipwreck, and fishing gear (e.g., downriggers and fishing line) entanglement. Together, these processes threaten the long-term sustainability of historic shipwrecks and other underwater cultural and historical resources and negatively impact their recreational and archaeological value.

Through a management plan and regulations implemented under the National Marine Sanctuaries Act (NMSA), NOAA would study and, where possible, reduce threats to these resources that could adversely affect their historical, archaeological, recreational, and educational value. This would be accomplished by the following:

- Protect and manage these significant underwater cultural and historical resources through a regulatory and non-regulatory framework;
- Document, further locate, and monitor these resources;
- Provide interpretation of their cultural, historical, and educational value to the public; and
- Promote responsible use of these resources for their recreational value.

2.2.1 Complementing and Supplementing Existing Regulatory Authorities

Without adequate legal authorities, underwater cultural and historical resources are vulnerable to human disturbance. Even when laws exist, gaps in the law or in application of the law can still result in exploitation, damage, and irreparable loss and to our understanding of the past. When Congress amended the NMSA in 1984, it recognized that while there were numerous statutes that managed specific natural and historical resources, there were no statutes that took a holistic approach to managing multiple resources in marine areas. Therefore, Congress clarified that one purpose of the NMSA is to provide coordinated and comprehensive management of special areas of the marine environment that would complement other existing resource protection laws (Pub. L. 98-498, 98 Stat. 2296 (1984)).

⁷ Terminology from the National Marine Sanctuaries Act

By designating this area as a national marine sanctuary, NOAA would implement site-specific regulations to complement and supplement existing federal and state statutes designed to protect underwater cultural and historical resources and fill current legal gaps to ensure this area of special national significance is recognized, managed, researched, interpreted, and accessible to the public. See Section 3.4.2 for an overview of potential sanctuary regulations and Appendix C for a comprehensive analysis of how the NMSA would complement and supplement existing state and federal authorities. A summary is provided below.

Federal statutes that apply to underwater cultural and historical resources include the Archaeological Resources Protection Act (ARPA; 16 USC 470aa *et seq.*), NHPA, CZMA, and NEPA. The ARPA, NHPA, CZMA, and NEPA all created public processes whereby federal agencies must assess alternatives or mitigation measures to minimize impacts to cultural resources by any federal action that is undertaken, licensed, or permitted by a federal agency or funded with federal dollars. However, preservation provisions in these laws do not apply to activities conducted by private citizens; are project-specific; and do not provide a comprehensive, long-term resource management framework for underwater cultural and historical resources.

New York state statutes that apply to cultural resources are the State Education Law and The New York Historic Preservation Act of 1980. Historic shipwrecks in New York are protected by the State Education Law, which makes it unlawful for any person to “investigate, excavate, remove, injure, appropriate or destroy any object of archaeological, historical, cultural, social, scientific, or paleontological interest situated on, in or under lands owned by the state of New York without written permission of the commissioner of education” (N.Y. Educ. Law 233(4)). Although section 233(4) of New York’s Education Law contains language that appears similar to the proposed NOAA prohibition on damaging or altering sanctuary resources, the state law has a complementary, but significantly distinct, purpose from NMSA. This state law is aimed at ensuring the appropriate acquisition of cultural and historical objects for the state museum’s archiving purposes and authorizing the issuance of permits to excavate and gather cultural and historical objects, as opposed to preserving *in situ* historic and culturally significant areas within the marine environment. In contrast to the NMSA, Section 233 of New York’s Education Law does not create any programs for education, interpretation, enforcement, and underwater archaeological research. In addition, New York’s cultural resource permitting program is largely focused on permitting terrestrial resources rather than submerged resources. The proposed sanctuary regulations would provide broader regulatory authority by proactively prohibiting certain conduct, or attempted conduct, that may lead to damaging sanctuary resources. In contrast, New York would have to prove injury or destruction to a resource after damage has occurred to establish a violation of Sec. 233. By focusing entirely on underwater cultural and historical resources, NOAA would enhance existing state authorities and programs for these resources.

Related to this, the New York Historic Preservation Act of 1980 mirrors the NHPA by requiring state agencies to assess the potential impacts of projects that they fund, permit, or approve on cultural resources that are eligible or listed on the State Register of Historic Places and National Register of Historic Places. However, only one shipwreck in Lake Ontario has been listed on these registers, and the act applies to activities that are funded, licensed, or approved by state

agencies but not to those conducted by private entities. The NMSA would supplement the New York Historic Preservation Act of 1980 by applying to activities conducted by federal, state, and private citizens and would protect all shipwrecks and other cultural underwater resources within sanctuary boundaries regardless of whether they are eligible or listed on the State Register of Historic Places and National Register of Historic Places.

Designating the proposed national marine sanctuary under the NMSA would complement and supplement these state and federal cultural resource protection laws by creating a uniform regulatory regime to manage these nationally significant resources. Sanctuary regulations would apply to all underwater cultural and historical resources in the sanctuary's boundaries, regardless of whether the sites are eligible or listed on the state and national registers. The regulations in the proposed sanctuary would also apply to all federal, state, and private undertakings. As mentioned above, designation under the NMSA would provide an active, comprehensive management regime for these nationally significant underwater cultural and historical resources that the other federal statutes do not cover.

Sanctuary designation would also provide additional enforcement authorities. A violation of state law would be classified as a criminal violation; there are no civil penalties prescribed under state law. In addition, there are limited mechanisms for detecting violations or for responding to reported violations of Section 233 permits. In contrast, the NMSA authorizes NOAA to assess civil penalties for violations of the NMSA or its implementing regulations, as well as damages against parties that injure sanctuary resources. The NMSA also authorizes NOAA to board, inspect, and search vessels being used to violate the statute, and to seize wherever found any sanctuary resource taken or retained in violation of the statute or its implementing regulations. Criminal actions require a higher standard and more effort on the part of law enforcement. The NMSA authorizes the assessment of civil administrative penalties, which can provide a more efficient and expeditious deterrent mechanism than criminal sanctions. Furthermore, as a strict liability statute, NMSA does not require proof of a particular culpable mental state to impose an appropriate civil penalty. Civil penalties provide for a simpler "ticket-based" approach to violations.

Section 307 of the NMSA authorizes NOAA to enforce provisions of the NMSA by utilizing the personnel, services, and facilities of state departments, agencies, and instrumentalities on a reimbursable or non-reimbursable basis (16 U.S.C. § 1437). NOAA has entered into a cooperative enforcement agreement (CEA) with the New York State Department of Environmental Conservation (NYSDEC) that federally deputizes NYSDEC officers as authorized officers to perform certain marine conservation law enforcement activities on behalf of NOAA under other authorities. In addition, NOAA had entered into a joint enforcement agreement (JEA) with NYSDEC that, among other things, outlines the authority to enforce applicable federal marine conservation laws consistent with the CEA, specifies DEC's commitment to provide resources under the agreement, identifies federal enforcement priorities, and provides for NOAA's funding for enforcement personnel, services, and facilities provided by NYSDEC. However, at present, the JEA does not authorize NYSDEC to use any of the funding currently provided under the agreement to enforce the NMSA because no national marine sanctuary has yet been designated within New York. Designating a sanctuary in Lake Ontario would enable NOAA to work with NYSDEC to amend the existing JEA to include law enforcement activities in

Lake Ontario under the NMSA. Other state agencies may also be involved in enforcing sanctuary regulations outside of this agreement.

A CEA/JEA arrangement would provide a substantial benefit to both NOAA and NYSDEC because federally deputized NYSDEC officers are authorized to utilize the robust enforcement authorities set forth at 16 U.S.C. § 1437(b). Therefore, in addition to federal law enforcement personnel employed by NOAA's Office of Law Enforcement, federally deputized NYSDEC officers would be authorized to conduct investigative activity and develop case referrals for violations of NMSA, its implementing regulations, and permits issued by NOAA's Office of National Marine Sanctuaries. Federally deputized NYSDEC officers would be granted additional investigatory authority to protect culturally, historically, archaeologically, recreationally, educationally, and scientifically valuable resources than that which is currently available under section 233 of the New York Education Law. Furthermore, when NYSDEC officers act as federally deputized authorized officers under the CEA/JEA arrangement, their enforcement activity is funded by NOAA and prioritized to achieve the goals and objectives of the stated marine conservation laws. As a result, a NOAA/NYSDEC joint enforcement partnership under NMSA would assemble more personnel, resources, and mechanisms to successfully discover and prosecute violations than either NOAA or NYSDEC could achieve independently under existing circumstances.

2.2.2 Additional Management Tools

Field research, collection of baseline data, and long-term monitoring are integral to mitigating negative human and natural impacts on underwater cultural sites. NOAA relies on monitoring programs for sanctuary resources to help identify resource changes over time and evaluate negative impacts at underwater cultural sites. NOAA also develops a range of resource management measures, such as permanent moorings at shipwreck sites, best practices for anchoring and site access, law enforcement, education and outreach initiatives, and research and surveying.

In addition, there are shipwrecks yet to be discovered in the area proposed for sanctuary designation. Locating these shipwrecks through remote sensing surveys is an essential step in fully characterizing and managing the area. A national marine sanctuary can both provide and attract resources and partners to accomplish these surveys, thereby enhancing proactive management of underwater cultural and historical resources. New York state does not have the existing capacity to meet this need.

Finally, NOAA would develop education and outreach programs to educate the public about the significance of these underwater cultural and historical resources and to promote sustainable recreation and tourism opportunities in the proposed sanctuary. NOAA's education and outreach efforts encourage the responsible use of sanctuary resources, promote a sense of public stewardship, help reduce human impacts, and promote accessibility.

2.3 Co-Management with New York State

NOAA would co-manage the proposed sanctuary with New York state. NOAA's expertise in cultural resource management would complement the state's current historical resource protection activities and bring a comprehensive and coordinated management approach to this historic collection of nationally significant underwater cultural and historical resources. NOAA would work with the state and other partners to conduct research and monitoring activities to fill important gaps in the archeological knowledge and historical context of these shipwrecks, enforce sanctuary regulations, enhance public appreciation of the significance of these resources, mitigate human impacts, maintain sustainable access to the resources, and encourage public stewardship of the area.

Chapter 3: Alternatives

3.1 Introduction

This chapter describes the alternatives NOAA developed and the process used to develop them. NOAA developed its reasonable range of alternatives, including the No Action Alternative, as required by the Council on Environmental Quality's (CEQ's) NEPA regulations (40 CFR 1502.14, 1505.1(e) (1978))⁸ and the NOAA NEPA Companion Manual.

NOAA is considering three alternatives. Each of the action alternatives are comprised of three components, including:

Boundary: Boundaries of the proposed sanctuary.

Regulations: Proposed regulations to manage the sanctuary.

Management Plan and Field Activities: Non-regulatory activities, such as education, outreach, and research that NOAA would implement to manage the sanctuary.

The three alternatives are:

No Action Alternative: NOAA would not move forward with designating a sanctuary in Lake Ontario.

Alternative 1: NOAA would designate a sanctuary, with a boundary that would encompass 1,786 square miles in eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River. NOAA would prohibit activities that would damage a sanctuary resource; grappling into or anchoring on shipwreck sites; sale and trafficking of sanctuary resources; and interfering with federal investigations; and would implement a permit system for operating tethered systems at shipwreck sites. NOAA would implement the management plan in Appendix A and the field activities described in Section 3.4.3.2.

Alternative 2 (NOAA's Preferred Alternative): NOAA would designate a slightly smaller sanctuary than Alternative 1, with a boundary that would encompass 1,722 square miles in eastern Lake Ontario. NOAA would prohibit the same activities outlined under Alternative 1. NOAA would implement the same management plan and field activities as outlined under Alternative 1.

These alternatives are described in detail in this chapter.

3.2 No Action Alternative

Under the No Action Alternative, NOAA would not designate the proposed Lake Ontario National Marine Sanctuary. No sanctuary boundaries, regulations, or management plan would be established, and no field activities would take place under the NMSA. The long-term

⁸ This provision was relocated to 40 C.F.R. 1507.3(c) by the 2020 CEQ regulations. As noted above, *supra* note 5, this review is proceeding under the 1978 CEQ regulations.

protection and management of New York’s underwater cultural and historical resources would remain under existing state and federal authorities and programs. Under this alternative, existing legal protection now provided by Section 233 of the New York Education Law would not be strengthened by sanctuary regulations. Without the designation of the proposed Lake Ontario National Marine Sanctuary, NOAA resources would not be available to strengthen partnerships, to assist in the comprehensive management of underwater cultural and historical resources, and to provide additional resources for education, research, monitoring, and enforcement.

3.3 Development of the Action Alternatives

This section describes how NOAA developed the proposed action alternatives, including proposed sanctuary boundaries, regulations, and management plan activities.

3.3.1 Development of Proposed Boundaries

This section identifies how NOAA developed its two boundary options:

1. 1,786 square miles in eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River
2. 1,722 square miles in eastern Lake Ontario

NOAA’s first step in developing boundary options involved reviewing the sanctuary nomination, gathering comments during the scoping period, working with the Sanctuary Advisory Council, and coordinating with the state of New York. For the second step, NOAA conducted research on the location and importance of shipwrecks and other maritime heritage resources within the region, and then the agency developed proposed boundaries to manage these resources. NOAA amended the boundaries in response to public comments collected on the draft EIS and the notice of proposed rulemaking (refer to Section 1.3.1, Section 1.3.3, and Appendix D: Response to Comments for more detail).

3.3.1.1 NOAA’s Research on Identification of Underwater Cultural and Historical Resources in the Area

To identify underwater cultural and historical resources in eastern Lake Ontario and the St. Lawrence River, NOAA’s archaeologists worked with existing Great Lakes shipwreck databases, under the guidance of regional historians, to compile a list of potential shipwrecks, aircraft, and other archaeological sites located or wrecked within the potential sanctuary boundary.

Following the NRHP site eligibility guidelines, NOAA only considered resources over 50 years of age to be “historic.” NOAA used the following definition of “shipwreck site” in its research as criteria for a site to qualify as a shipwreck: all archaeological and material remains associated with sunken watercraft or aircraft that are historical resources, including associated components, cargo, contents, artifacts, or debris fields that may be exposed or buried within the lakebed. NOAA conducted additional historical research for each vessel and aircraft, assigning a confidence value corresponding to the likelihood that the resource is still present within the proposed sanctuary boundary. Low confidence values correlated to resources that had been likely removed (e.g., via salvage), destroyed, or had very limited locational information that would support a future site identification. High confidence values were assigned to sites that

were presumed to exist within the proposed boundary due to the circumstances of their wrecking event or eyewitness accounts.

NOAA then reached out to regional historians, shipwreck experts, and archaeologists for additional information regarding these sites and their confidence values (see Section 4.2 for a detailed analysis of the resources in the area), resulting in an updated list of known and potential shipwrecks located within the proposed boundary. NOAA maintains an internal database of historic vessels lost within the sanctuary in addition to the potential and known archaeological site lists. Given the low confidence value attributed to many of the historic shipwreck events due to salvage/destruction, however, historic vessel losses are not always included in the potential shipwreck counts for the proposed sanctuary.

NOAA notes that although all appropriate efforts have been made to ensure the accuracy and completeness of information regarding shipwreck sites, the potential shipwreck counts listed in this final EIS are subject to change as additional historical research and archaeological survey work is conducted in eastern Lake Ontario.

3.3.2 Development of Proposed Regulations

Under the NMSA, NOAA establishes site-specific regulations at each national marine sanctuary based on threats to sanctuary resources. Based on an analysis of threats facing underwater cultural and historical resources in Lake Ontario and the Thousand Islands region (see Section 2.2), input from public scoping meetings, consultation with the state of New York, and input from the Sanctuary Advisory Council, NOAA considered the following regulatory concepts in the draft EIS to prohibit the following activities:

- Damage/injury to underwater cultural and historical resources
- Use of anchors and grappling hooks at shipwreck sites
- Use of tethered systems (such as remotely operated vehicles) at shipwreck sites without a permit
- Possession and sale of artifacts

NOAA did not receive any public comments on these regulatory concepts during the public comment period for the draft EIS. Next, NOAA published a notice of proposed rulemaking that turned these regulatory concepts into proposed regulations to manage LONMS and sought public comments on them. Although not included in the regulatory concepts identified in the draft EIS, NOAA also included a prohibition on interference with federal investigations in the proposed rulemaking to be consistent with ONMS program regulations. In response to public comment on the notice of proposed rulemaking, NOAA is proposing to delay the implementation of the prohibition on grappling into or anchoring on shipwreck sites for two years (refer to Section 1.3.3 and Appendix D: Response to Comments for more detail on how the proposed regulations have evolved throughout the designation process).

3.3.3 Development of the Management Plan

Management plans are sanctuary-specific planning and management documents used by all national marine sanctuaries. Management plans fulfill many functions, including describing regulations and boundaries; outlining staffing and budget needs; setting priorities and

performance measures for resource protection, research, and education programs; and guiding development of future budgets and management activities. This plan would chart the course for the proposed sanctuary over the next five to 10 years.

NOAA received input from the Sanctuary Advisory Council on the draft management plan, including strategies and activities to achieve the proposed sanctuary's management goals. Using management plans from Thunder Bay National Marine Sanctuary and proposed Wisconsin Shipwreck Coast National Marine Sanctuary as examples, Sanctuary Advisory Council subcommittees wrote the following action plans: Research and Monitoring, Education and Outreach, Tourism and Economic Development, and Resource Protection. After a period of review by Sanctuary Advisory Council members, the council passed a resolution on November 19, 2020, to submit the draft management plan to NOAA.

Based on input from the public, input from the Sanctuary Advisory Council, state of New York, and NOAA's expertise managing other national marine sanctuaries, NOAA developed the following actions plans as part of the management plan:

- **Sanctuary Operations Action Plan:** Create sanctuary infrastructure and program support to ensure effective implementation of the management plan.
- **Research and Monitoring Action Plan:** Conduct research to support resource protection, resource management, socioeconomic uses, and education initiatives.
- **Education and Outreach Action Plan:** Enhance public awareness, understanding, and stewardship of sanctuary resources and their connection to the environment and history of Lake Ontario, the St. Lawrence River, the Great Lakes, and the ocean.
- **Tourism and Economic Development Action Plan:** Promote sustainable and community-based tourism and economic development initiatives in Lake Ontario communities in collaboration with communities.
- **Resource Protection Action Plan:** Strengthen resource protection by promoting responsible use of sanctuary resources, developing resource protection-focused outreach, responsible tourism and education initiatives, conducting on-water resource protection activities, enhancing enforcement efforts, and assessing how climate change may impact sanctuary resources.

Based on comments on the draft management plan and on further input from the Sanctuary Advisory Council and state of New York, NOAA refined activities within the management plan (refer to Section 1.3.1, Section 1.3.3, and Appendix D: Response to Comments for more detail).

3.3.4 NOAA's Preferred Alternative

NOAA did not identify a preferred alternative in the draft EIS. After receiving public comments on the alternatives presented in the draft EIS, NOAA selected Alternative 2 as the basis for the proposed boundary and regulations in the proposed rulemaking. Alternative 2 remains NOAA's preferred alternative.

3.4 Alternative 1 (Eastern Lake Ontario and Thousand Islands)

This section describes the components of Alternative 1, which includes a proposed boundary, proposed regulatory concepts, and implementation of a management plan.

3.4.1 Proposed Boundary (Alternative 1)

3.4.1.1 Boundary Description

Under Alternative 1, the proposed sanctuary boundary would include 1,786 square miles in eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River. More specifically, the sanctuary would incorporate 1,724 square miles of eastern Lake Ontario waters and 62 square miles of the St. Lawrence River from the mouth of the river to Chippewa Bay northeast of Oak Island. The sanctuary would border the counties of Wayne, Cayuga, Oswego, and Jefferson, and a portion of St. Lawrence County (Figure 3.1).

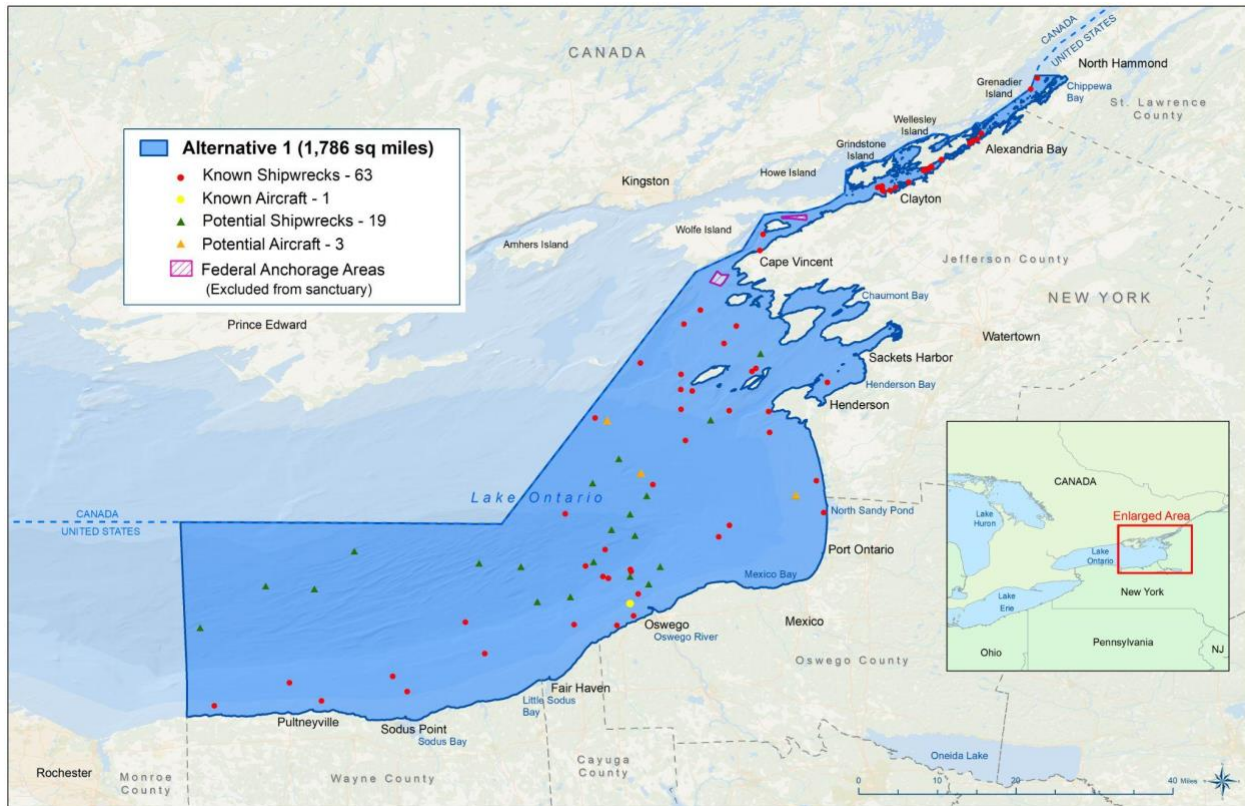


Figure 3.1. Geographic boundaries of Alternative 1, which covers 1,786 square miles of eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River. Image: NOAA.

For the Lake Ontario shoreline, NOAA would set the shoreline sanctuary boundary at the Low Water Datum (LWD) as defined by the International Great Lakes Datum (IGLD). The LWD is set at a fixed elevation of 243.3 feet above sea level. The LWD is determined by the U.S. Army Corps of Engineers and is the chart datum to which soundings are referenced for NOAA charts in the Great Lakes. The LWD is also well understood internationally because it is a fixed datum

for each lake. The state of New York uses the LWD as the line that delineates public ownership. If designated, the sanctuary boundary would automatically incorporate any changes to the shoreline as defined by the LWD when the datum is updated in the future.

NOAA would set the northern boundary along the U.S. and Canadian border in both Lake Ontario and the St. Lawrence River. The western sanctuary boundary would be at the western border of Wayne County and the eastern boundary would be around Chippewa Bay in St. Lawrence County. Along the St. Lawrence River, the landward boundary would be the Ordinary High Water Mark, which delineates the publicly-owned bottomlands. The Ordinary High Water Mark is defined as “the line on the shore in non-tidal areas established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding area” (U.S. Army Corps of Engineers New York District, 2014).

The final detailed legal sanctuary boundary description and coordinates for the sanctuary will be published in the final rulemaking and codified in title 15 of the Code of Federal Regulations⁹ under the Office of National Marine Sanctuaries’ regulations (15 CFR Part 922) in subpart U of part 922.

3.4.1.2 Exclusion of Areas from Proposed Boundary

To ensure compatible use with commercial shipping and other activities, NOAA would exclude the ports and harbors of Oswego, Pultneyville, Little Sodus Bay, Sodus Bay, and Port Ontario. NOAA would exclude the federal navigation channel approaches to these harbors and federal anchorage areas from the proposed sanctuary to avoid unintended effects on port operations critical to the local, regional, and national economies. NOAA would also exclude privately owned bottomlands from the sanctuary. NOAA would include Sackets Harbor in the sanctuary because of the possible presence of underwater cultural and historical resources there.

⁹ <https://www.ecfr.gov/current/title-15/subtitle-B/chapter-IX/subchapter-B/part-922#sp15.3.922.j>

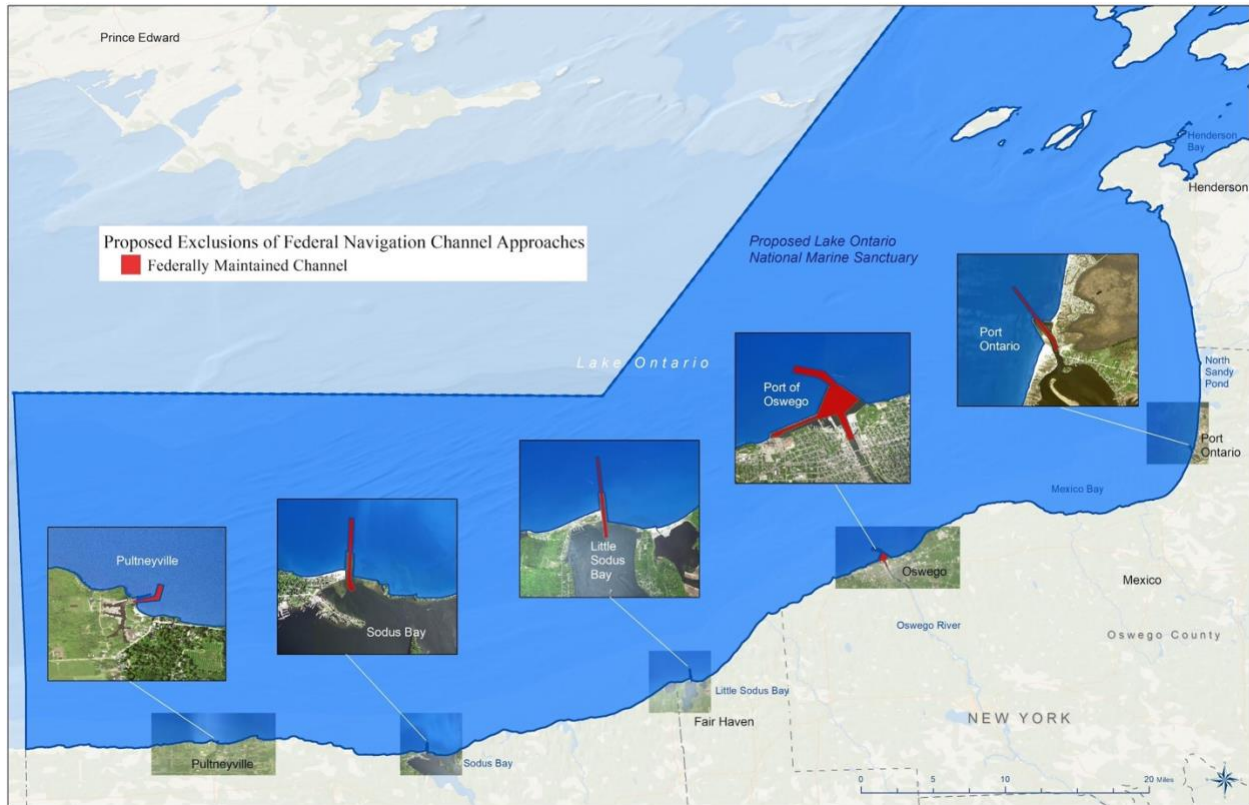


Figure 3.2. The federal navigation approaches, which are highlighted in red, to Oswego, Pultneyville, Little Sodus Bay, Sodus Bay, and Port Ontario would be excluded from the sanctuary. Map: NOAA

NOAA's proposed boundary would cut across the mouths of rivers, streams, creeks, and ponds as it continues along the coastline of the proposed sanctuary, which excludes those water bodies from the sanctuary. This is the case for East Bay, Port Bay, Blind Sodus Bay, North Pond, South Colwell Pond, Goose Pond, Floodwood Pond, and Black Pond. Therefore, these bays and their channels to the lake would not be within the boundaries of the sanctuary (see Figures 3.3–3.9).



Figure 3.3. This map illustrates how the proposed boundary cuts across the mouth of East Bay, which excludes the bay from the sanctuary. Map: NOAA



Figure 3.4. This map illustrates how the proposed boundary cuts across the mouth of Port Bay, which excludes the bay from the sanctuary. Map: NOAA



Figure 3.5. This map illustrates how the proposed boundary cuts across the mouth of Blind Sodus Bay, which excludes the bay from the sanctuary. Map: NOAA

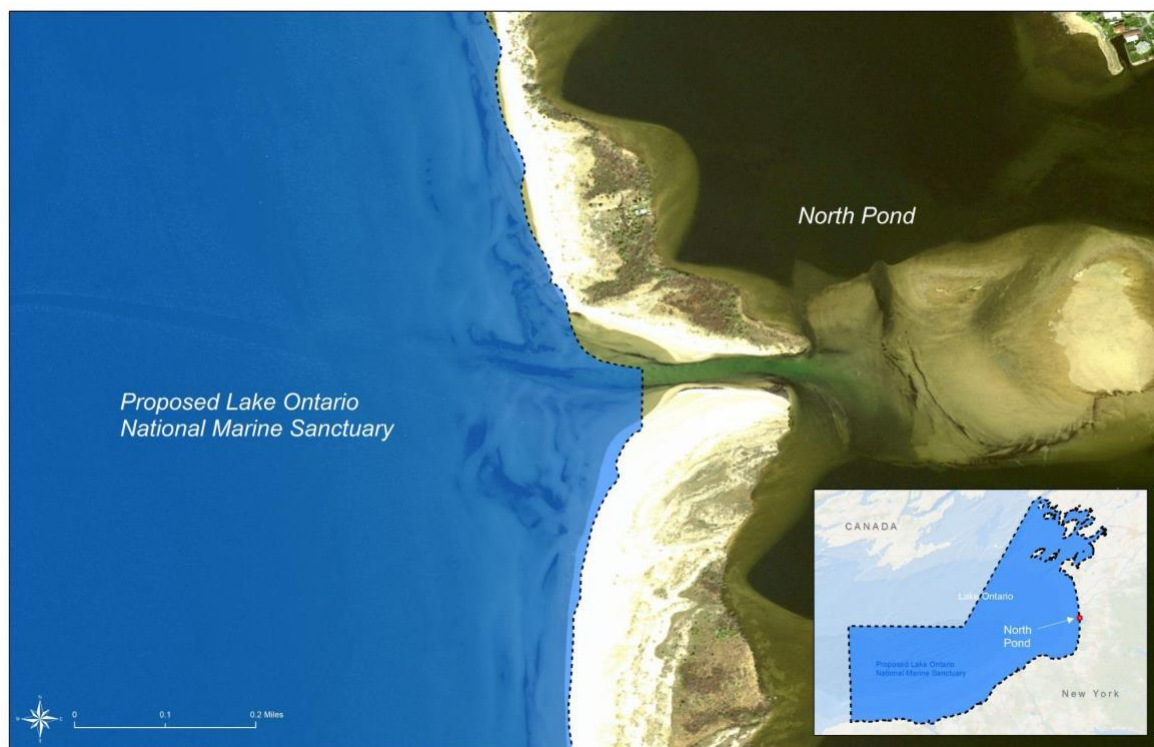


Figure 3.6. This map illustrates how the proposed boundary cuts across the mouth of North Pond, which excludes the bay from the sanctuary. Map: NOAA



Figure 3.7. This map illustrates how the proposed boundary cuts across the mouth of South Colwell Pond, which excludes the bay from the sanctuary. Map: NOAA



Figure 3.8. This map illustrates how the proposed boundary cuts across the mouth of Goose Pond and Floodwood Pond, which excludes these waters from the sanctuary. Map: NOAA



Figure 3.9. This map illustrates how the proposed boundary cuts across the mouth of Black Pond, which excludes the bay from the sanctuary. Map: NOAA

3.4.1.3 Underwater Cultural and Historical Resources Within the Boundary

As listed in Table 3.1, Alternative 1 would include a total of one known aircraft and 63 known shipwrecks, including one shipwreck (*St. Peter*) listed on the National Register of Historic Places and another listed as a New York State Submerged Cultural Preserve and Dive Site (*David W. Mills*). Additional underwater cultural and historical resources that may be within the boundaries include approximately 19 potential shipwreck sites (shipwrecks may exist, but additional research is needed to verify and describe these shipwrecks); three aircraft; and several other archaeological sites, including remnants of piers, aids to navigation, historic middens, and historic properties that may be of religious and cultural significance to Indigenous nations and tribes. These numbers have changed slightly from those presented in the draft EIS (See Table 1.1 for more information). See Section 4.2 for additional information regarding the historical and cultural importance of these shipwrecks.

Table 3.1. Number of known and potential shipwrecks to be discovered within Alternative 1's boundary, which covers part of eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River.

	Known Shipwrecks	Potential Shipwrecks	Known Aircraft	Potential Aircraft
Eastern Lake Ontario	41	19	1	3
Thousand Islands Region	22	0	0	0
Total Sites Within Alternative 1	63	19	1	3

3.4.2 Proposed Regulations (Alternative 1)

NOAA is proposing the following definitions and regulations to implement under Alternative 1 to manage and protect the underwater cultural and historical resources in the proposed Lake Ontario National Marine Sanctuary. The regulations address threats to underwater cultural and historical resources as identified in Chapter 2 and would complement and supplement existing New York statutes protecting underwater cultural and historical resources.

Under Alternative 1, NOAA proposes the following **definitions** to clarify how the regulations would apply in the proposed sanctuary:

- “Sanctuary resource” means all historical resources as defined at 15 CFR 922.11, which includes any pre-contact and historic sites, structures, districts, objects, and shipwreck sites within sanctuary boundaries.
- “Shipwreck site” means all archaeological and material remains associated with sunken watercraft or aircraft that are historical resources, including associated components, cargo, contents, artifacts, or debris fields that may be exposed or buried within the lakebed.
- “Tethered underwater mobile system” means remotely operated vehicles and other systems with onboard propulsion systems that utilize a tether connected to a station-holding (e.g., by anchor, dynamic positioning, or manual vessel operation) surface support vessel.

NOAA is proposing the following regulations to protect sanctuary resources:

1. Prohibit damage to sanctuary resources

NOAA is proposing to prohibit “moving, removing, recovering, altering, destroying, possessing or otherwise injuring, or attempting to move, remove, recover, alter, destroy, possess or otherwise injure a sanctuary resource.” This prohibition aims to reduce the risk of direct harm to sanctuary resources. NOAA has implemented similar regulations at other national marine sanctuaries and has determined that it effectively protects underwater cultural and historical resources while allowing for compatible uses within the sanctuary.

“Moving” and “altering” would include any changes to the position or state of sanctuary resources, as well as covering, uncovering, moving, or taking artifacts, even if the artifacts are not located on or near a shipwreck. This sanctuary prohibition would supplement section 233 of the New York State Education Law which makes it unlawful for any person to “investigate, excavate, remove, injure, appropriate or destroy any object of archaeological, historical, cultural,

social, scientific or paleontological interest situated on, in or under lands owned by the state of New York without written permission of the commissioner of education” (NY Educ L § 233.4). This state regulation currently applies in U.S. waters of Lake Ontario and would continue to apply to resources in these waters if the sanctuary is designated.

2. Prohibit grappling into or anchoring on shipwreck sites

To preserve the integrity of shipwreck sites in the proposed sanctuary, NOAA is proposing to prohibit “grappling into or anchoring on shipwreck sites” within the sanctuary boundaries. NOAA is proposing this regulation to protect fragile shipwrecks and aircraft within the sanctuary from damage due to anchors and grappling hooks. In consultation with the state of New York, specifically the New York State Office of Parks, Recreation and Historic Preservation, New York State Museum, and New York Department of State, these state agencies noted the importance of preventing anchor damage to shipwreck sites. In addition, the Sanctuary Advisory Council subcommittee on resource protection noted that anchor damage exists at some shipwreck sites.

To facilitate sustainable recreational access to shipwrecks, NOAA would develop a mooring program to install and maintain access at popular dive sites. These moorings would include buoys and other types of access infrastructure for sites where buoy placement is not advisable. Moorings would provide secure and convenient anchoring points for users, which would mitigate damage from grappling or anchoring. NOAA would also publish guidelines on best practices for anchoring near shipwreck sites to avoid violating this prohibition.

Delayed Date of Implementation

NOAA recognizes that it would take time to install moorings at shipwrecks sites, and that some sites (particularly deep, technical-diving-depth sites) create challenges for typical mooring systems. Consequently, under all action alternatives, NOAA is proposing a two-year delay in the implementation of the no-anchoring or grappling prohibition. During this period, the sanctuary would work with the state, the Sanctuary Advisory Council, a diver working group, and other relevant stakeholders to develop a mooring implementation and best practices plan.

The purpose of this postponement is to provide NOAA with adequate time to develop a shipwreck mooring program in consultation with the dive community and state and federal agencies; begin installing moorings at high priority shipwreck sites; and publish site plans and best practices for accessing shipwreck sites with and without moorings. It is important to note that all other regulations would remain in effect during this two-year postponement.

3. Prohibit use of tethered underwater mobile systems at shipwreck sites without a permit

Tethered underwater mobile instruments, such as remotely operated vehicles (ROVs), are widely used in underwater survey and site exploration activities, as they enable access to underwater cultural and historical resources at depths beyond recreational and technical diving limits. As tethered instrument use has continued to increase in the scientific, commercial, and recreational user communities, there is a heightened threat of damage to submerged cultural resources by these systems. Tethered systems present three distinct threats to shipwreck sites:

intentional site disturbance, incidental site disturbance, and site pollution. Intentional disturbance includes the intentional recovery of sanctuary resources from a wreck site, which may include minor alterations or large-scale recovery. Incidental disturbance occurs when a tethered system makes contact with the wreck or the instrument tether gets entangled on protruding portions of a wreck, such as the mast. Under these circumstances, disentanglement or attempted disentanglement of snagged instruments can displace or damage the wreck. The impact from such activities can result in severe damage to artifact assemblages and the structural integrity of a site. This risk is particularly concerning in the proposed sanctuary area, where a large number of wrecks have intact masts and high site integrity. Finally, if the instrument cannot be disentangled, cutting the tether line leads to pollution of the site with abandoned equipment.

Therefore, NOAA proposes to prohibit “deploying a tethered underwater mobile system at shipwreck sites” without a sanctuary permit. The proposed provision would complement the state of New York’s prohibition on damaging cultural resources by proactively deterring damage, disturbance, and pollution of these nationally significant sites from tethered systems. Because the state of New York does not proactively manage or protect shipwrecks in Lake Ontario, it also does not regulate the use of tethered systems at shipwreck sites, which, as described above, pose a threat to these resources. The state of New York’s existing prohibition focuses on permitting for terrestrial resources, rather than underwater cultural and historical resources. As a result, the state of New York has limited staff expertise regarding maritime archaeology that could inform whether an application for the permitted use of a tethered system is consistent with the preservation of these underwater cultural and historical resources.

The prohibition on operating tethered systems at shipwreck sites would not apply to any activity conducted in accordance with the scope, purpose, terms, and conditions of a permit issued by NOAA, including special use permits pursuant to section 310 of the NMSA. NOAA proposes to allow users to apply for a permit to operate tethered underwater mobile systems at shipwreck sites within the sanctuary. NOAA would review project proposals against the permit criteria outlined in part 922, subpart D and the proposed permit conditions specific to LONMS to determine whether the proposed operation is consistent and compatible with the purposes of sanctuary designation. Permits issued by the state of New York relative to the state prohibition are intended to serve the purposes of the New York State Museum by ensuring the appropriate acquisition of cultural and historical objects for the state museum’s archiving purposes. Permits issued by NOAA would serve a distinct, yet complementary, purpose of ensuring the permitted activity is consistent and compatible with the purposes for which the sanctuary is designated. Furthermore, because NOAA’s proposed prohibition makes it unlawful for any person to deploy a tethered underwater mobile system at a shipwreck site without a NOAA permit, NOAA could target and investigate the unauthorized use of such systems at shipwreck sites before harm occurs. By contrast, the existing New York prohibition is ambiguous in its application prior to direct injury to cultural resources, and this ambiguity would complicate and potentially compromise similar proactive enforcement measures relying on this provision of New York state law. For more information about NOAA permits, please see 3.4.2.1 below.

NOAA does not intend for these regulations to apply to autonomous underwater vehicles or towed systems, such as side-scan sonar, magnetometers, survey trawls, or other survey

instruments that are pulled behind a vessel via a tow cable. Towed systems are typically operated high above the lakebed in order to avoid snagging on objects, so they do not present the same level of entanglement threat to shipwrecks as tethered underwater mobile instruments.

4. *Prohibit possessing, selling, purchasing, transporting, importing, or exporting any sanctuary resource within or outside of the sanctuary*

NOAA proposes to prohibit “possessing, selling, offering for sale, purchasing, importing, exporting, exchanging, delivering, carrying, transporting, or shipping by any means any sanctuary resource within or outside of the sanctuary.” This prohibition is intended to deter illegal salvage of sanctuary resources and to further the policy of *in situ* preservation of these resources. As noted, the listed activities would be prohibited both within and outside of the sanctuary. This prohibition is not intended to apply to artifacts or other historical resources collected before the effective date of sanctuary designation.

5. *Interfering with investigations*

NOAA proposes a regulation to prohibit “Interfering with, obstructing, delaying or preventing an investigation, search, seizure or disposition of seized property in connection with enforcement of the Act or any regulation or any permit issued under the Act.” This regulation will assist in NOAA’s enforcement of the sanctuary regulations and strengthen sanctuary management.

This proposed prohibition is consistent with the regulations for other sites within the National Marine Sanctuary System and also with Section 306 of the NMSA, which makes it unlawful to “interfere with the enforcement of [the NMSA]” (16 U.S.C. § 1436(3)).¹⁰

6. *Emergency Regulations*

Nationwide sanctuary regulations include a general authority for instituting emergency regulations. Emergency regulations would be used on a limited basis and under specific conditions when an imminent risk to sanctuary resources exists and a temporary prohibition would prevent the destruction or loss of those resources. As part of the designation, NOAA would have the authority to issue emergency regulations in LONMS. Emergency regulations are used in limited cases and under specific conditions when there is an imminent risk to sanctuary resources and a temporary prohibition would prevent the destruction or loss of those resources. An emergency regulation would not take effect without the approval of the governor of New York or her/his designee or designated agency. NOAA would only issue emergency regulations that address an imminent risk for a fixed amount of time with a maximum of six months that can be extended one time for no more than six months. NOAA must go through a full rulemaking process to consider making an emergency regulation a permanent regulation, which would include a public comment period.

¹⁰ Although it was not included in the list of regulatory concepts identified in the draft EIS, NOAA has determined that the inclusion of this proposed prohibition in the sanctuary regulations does not constitute a substantial change in NOAA’s proposed action of designating a national marine sanctuary in Lake Ontario, and that supplementation of the draft EIS is therefore not necessary pursuant to 40 C.F.R. § 1502.9(c).

7. *Treaty Rights*

NOAA also proposed a regulation to clarify and underscore that the exercise of treaty rights, reserved rights, or similar rights for federally recognized nations and tribes, including the Haudenosaunee Confederacy, and their citizens would not be modified, altered, or in any way affected by the proposed LONMS regulations. Under the proposed regulations, NOAA must consult with the governing body of each nation or tribe protected by the 1794 Treaty of Canandaigua regarding any matter which might affect the ability of their citizens to participate in activities protected by this treaty in the sanctuary. Please see Section 1.3.2.2 “Executive Order 13175: Consultation and Coordination with Indian Tribal Governments” of this document for information about how NOAA has engaged with nations and tribes through the sanctuary designation process.

3.4.2.1 *Permitting*

NOAA proposes to include in the LONMS regulations the authority to issue general permits, certifications, and authorizations to allow otherwise regulated or prohibited activities to occur in the sanctuary under certain conditions. As described below, the NMSA provides these authorities as a range of options to allow sanctuary managers the flexibility to address compatible uses while protecting sanctuary resources.

General Permits

Similar to other national marine sanctuaries, NOAA proposes to require a sanctuary general permit when an individual wishes to conduct an activity within the proposed sanctuary that is otherwise prohibited by sanctuary regulations (see proposed prohibitions above). Within the proposed LONMS, general permits could only be issued for otherwise prohibited activities that further the purposes of sanctuary education, research, or management. NOAA would execute this permit authority using the existing application procedures and permit review criteria. The [permit application materials](#)¹¹ and additional information related to general permits are available online.

Authorizations

NOAA’s proposed regulations would allow the agency to issue authorizations that would allow an individual to conduct an otherwise prohibited activity within the sanctuary if that activity is specifically authorized by any valid federal, state, or local lease, permit, license, approval, or other authorization. NOAA would also have the authority to add terms and conditions to authorizations to ensure that activities conducted within the sanctuary are carried out in a manner that is consistent with the purposes for which the sanctuary was designated. The proposed authorization authority is intended to streamline regulatory requirements by reducing the need for multiple permits for the same activity.

Certifications

Pre-existing activities conducted pursuant to a valid lease, permit, license, or right of subsistence use or of access might be occurring within the LONMS area on the date of sanctuary designation that would otherwise be prohibited by sanctuary regulations. NOAA’s proposed

¹¹ <https://sanctuaries.noaa.gov/management/permits/>

regulations would allow the agency to issue certifications to allow an otherwise prohibited activity to continue to occur within the sanctuary after sanctuary designation if that activity was specifically authorized by any valid federal, state, or local lease, permit, license, approval, or other authorization before the time of designation, pursuant to 15 C.F.R. 922.10. NOAA would consider issuing certifications for such authorized activities that are in place at the time the sanctuary designation becomes effective, provided that the holder of such authorization or right complies with NOAA's certification procedures and criteria within the timeline NOAA lays out to complete certifications. Under the proposed LONMS regulations, requests for certifying permitted existing uses would have to be received by NOAA within 90 days of the effective date of sanctuary designation.

Special Use Permits

NOAA has the authority under the NMSA to issue special use permits (SUPs) at national marine sanctuaries, as established by section 310 of the NMSA. SUPs can be used to authorize specific activities in a sanctuary if such authorization is necessary to establish conditions of access to, and use of, any sanctuary resource or to promote public use and understanding of a sanctuary resource. The NMSA requires SUPs to contain four specific conditions (16 U.S.C. 1441(c)): (1) activities must be compatible with the purposes for which the sanctuary is designated and with protection of sanctuary resources; (2) activities carried out under the permit must be conducted in a manner that does not destroy, cause the loss of, or injure sanctuary resources; (3) permittees are required to purchase and maintain comprehensive general liability insurance, or post an equivalent bond, against claims arising out of activities conducted under the permit and to agree to hold the United States harmless against such claims; and (4) SUPs shall not authorize the conduct of any activity for a period of more than five years unless renewed by the Secretary. As is the case with general permits, NOAA can place additional conditions on SUPs specific to the activity being permitted. The activities that qualify for a SUP are set forth in the Federal Register (78 FR 25957 (May 3, 2013); 82 FR 42298 (Sept. 7, 2017)). Categories of SUPs may be changed or added to through public notice and comment.

In its notice of proposed rulemaking, NOAA proposed a new SUP category for “the operation of tethered underwater mobile systems at shipwreck sites in Lake Ontario National Marine Sanctuary” that could apply when the proposed activity does not qualify for a general permit or authorization, as described above.¹² As explained in the notice of proposed rulemaking, NOAA determined that after appropriate environmental review and application of terms and conditions, operating tethered underwater mobile systems at shipwreck sites could occur without injuring sanctuary resources. Upon receiving a SUP application, NOAA will coordinate with the New York State Historic Preservation Officer to consider terms and conditions that prevent harm to sanctuary resources. NOAA expects that such terms and conditions would generally address potential impacts such as tether management and entanglement mitigation, as well as avoidance of site pollution. NOAA would conduct additional, project-specific environmental review, as appropriate, before issuing a SUP under this new category.

¹² A NOAA permit does not relieve a permittee of responsibility to comply with all other federal, state, and local laws and regulations, and the permit is not valid until all other necessary permits, authorizations, and approvals are obtained. A permittee must, at all times, comply with the terms and conditions of the permit. As co-managers, NOAA will coordinate the issuance of permits with the state of New York.

While the NMSA allows NOAA to assess and collect fees for the conduct of any activity under an SUP, it also allows NOAA to waive or reduce fees for activities that do not derive profit from the access or use of sanctuary resources. NOAA proposes to waive the associated fee for issuing an SUP for operating tethered underwater mobile systems at shipwreck sites within LONMS when non-commercial operators do not derive profits from their use of the sanctuary or when the operators further the sanctuary's objectives (e.g., educating the public about the sanctuary or contributing to the sanctuary's research goals).

3.4.3 Proposed Management Plan and Field Activities (Alternative 1)

This section describes the management plan and associated field activities NOAA would implement in the proposed Lake Ontario National Marine Sanctuary under Alternative 1.

3.4.3.1 Proposed Management Plan (Alternative 1)

Under Alternative 1, NOAA would implement the management plan issued as part of the proposed action (see Appendix A). The management plan describes management actions and strategies that NOAA intends to implement over time to protect the nationally significant resources within LONMS, and to help conserve and promote the sanctuary resources that have been located and those that await discovery. As identified in Section 3.3.3, the five action plans are: Sanctuary Operations, Research and Monitoring, Education and Outreach, Tourism and Economic Development, and Resource Protection.

NOAA proposes to work in cooperation on the management plan action plans with the New York Office of Parks, Recreation and Historic Preservation; New York State Museum; New York State Office of General Services; New York State Department of Environmental Conservation; and New York State Department of State (including the New York Coastal Management Program) in their role as trustees for state resources. In addition, partnerships with private businesses, non-governmental organizations, educational and cultural institutions, and other local, state, and federal agencies would provide expertise for scientific research and exploration, resources and capacities for site monitoring and enforcement, and support for education and outreach programs. The many partnerships developed over the course of this nomination and designation process have been, and would continue to be, critical to the success of the sanctuary.

3.4.3.2 Proposed Field Activities to Implement the Sanctuary Management Plan (Alternative 1)

In order to implement the proposed management plan, NOAA would conduct the following categories of field activities: vessel operations and maintenance; scuba or snorkel operations; deployment of autonomous underwater vehicles (AUVs), remotely operated vehicles (ROVs), and potentially gliders and drifters; and installation of permanent mooring systems.

Vessel Operations and Maintenance

The Great Lakes field season typically occurs from early spring through late fall. Experience at Thunder Bay National Marine Sanctuary, located in Lake Huron, suggests that NOAA would operate vessels approximately 40–50 days on the water per year, though less in the sanctuary's initial years of operation. NOAA's Great Lakes fleet is managed by the NOAA Great Lakes Environmental Research Lab but used by several NOAA program offices. Vessels in the fleet

range from 26–80 feet in length with a variety of capabilities to support remote sensing sonar operations, diving, and other marine operations and archaeological fieldwork. All NOAA-operated vessels would follow ONMS best management practices for field activities and NOAA [Small Boat Safety Program](#)¹³ guidelines (NAO 209-125).

Scuba Diving, Echosounders (Sonars), Remotely Operated Vehicles, and Other Operations

One of the priorities in the management plan would be to characterize the proposed sanctuary's underwater cultural and historical resources and landscape features. This is typically accomplished with remote sensing surveys using sonars, diving, and remotely operated vehicle (ROV) operations when underwater cultural and historical resources are found. Experience at Thunder Bay National Marine Sanctuary suggests that as the sanctuary matures, NOAA and its partners would conduct approximately 300 dives per year (fewer in initial years of sanctuary operation), use both towed and hull-mounted sonars for several weeks per year, and support other operations, such as autonomous and remotely operated underwater vehicles, as opportunities arise.

Due to the depths of some shipwreck sites, accessing these sites would require technical diving operations. These operations would generally consist of up to six bottom/support divers in the water accessing shipwreck sites at depths between 150–330 feet. When engaged in this type of diving, sanctuary research vessels typically operate in a “live boat” mode, meaning they are not anchored. A small weighted visual surface buoy marker would be deployed on the dive site to guide divers to the bottom. Divers typically conduct non-invasive recording (photo-video documentation and measurements) and deploy self-contained lift bags (air-fillable canvas float bags) as an ascent line.

NOAA staff would employ echosounders (sonars) to locate and identify underwater cultural and historical resources and landscape features. The sanctuary would use towed and hull-mounted echosounders that transmit repeated series of short sound pulses to image the subsurface. The echosounders may be single beam or multibeam, which transmits a fan of acoustic energy for greater bottom coverage. During a survey, a vessel equipped with one or more echosounders “mows the lawn” at a slow speed to ensonify (or visualize) the subsurface and ensure full coverage within each project area. NOAA would conduct up to 20 expeditions per year using towed or hull-mounted sonars. Each deployment would typically last for up to one week and operate 12–24 hours per day.

NOAA uses ROVs and uncrewed systems to carry and operate scientific instruments and cameras to collect data. NOAA would conduct up to 20 deployments of ROVs or other uncrewed systems per year. ROVs are operated remotely by a human operator and are often tethered to a crewed vessel. Uncrewed systems operate with various levels of autonomy and include uncrewed underwater vehicles (UUVs, sometimes referred to as AUVs) and uncrewed surface vehicles (USVs, sometimes referred to as autonomous surface vehicles or ASVs). These items use a variety of propulsion sources, including diesel, diesel/electric, battery, solar, buoyancy driven, and wave-gliding propulsion systems.

¹³ <https://www.noaa.gov/organization/administration/nao-209-125-noaa-small-boat-safety-program>

Deployment of Infrastructure for Site Access, Including Mooring Systems

One method of promoting public access while protecting shipwrecks is to install and maintain permanent moorings at popular diving locations. Moorings would provide secure and convenient anchoring points for users and eliminate the need for anchoring directly into a shipwreck site. In addition, moorings facilitate public access and safer diving by providing a sturdy means of descent and ascent for divers.

NOAA anticipates installing permanent moorings at certain shipwreck sites within the proposed sanctuary. The mooring systems would generally consist of a mooring block positioned near a shipwreck site, to which appropriately sized tackle, subsurface float, and surface buoy would be attached and would be regularly inspected and maintained for safety and utility. NOAA would follow best practices when selecting mooring installation locations, such as avoiding any cultural resources or sensitive benthic habitats.

3.5 Alternative 2: Preferred Alternative (Eastern Lake Ontario)

3.5.1 Proposed Boundary (Alternative 2: Preferred Alternative)

3.5.1.1 Boundary Description

Under Alternative 2, the proposed sanctuary boundary would include 1,722 square miles of eastern Lake Ontario. This area includes the same underwater cultural and historical resources included in Alternative 1 in the eastern Lake Ontario segment but would not include underwater cultural resources in the St. Lawrence River. The sanctuary would border Wayne, Cayuga, Oswego, and Jefferson counties (Figure 3.10).

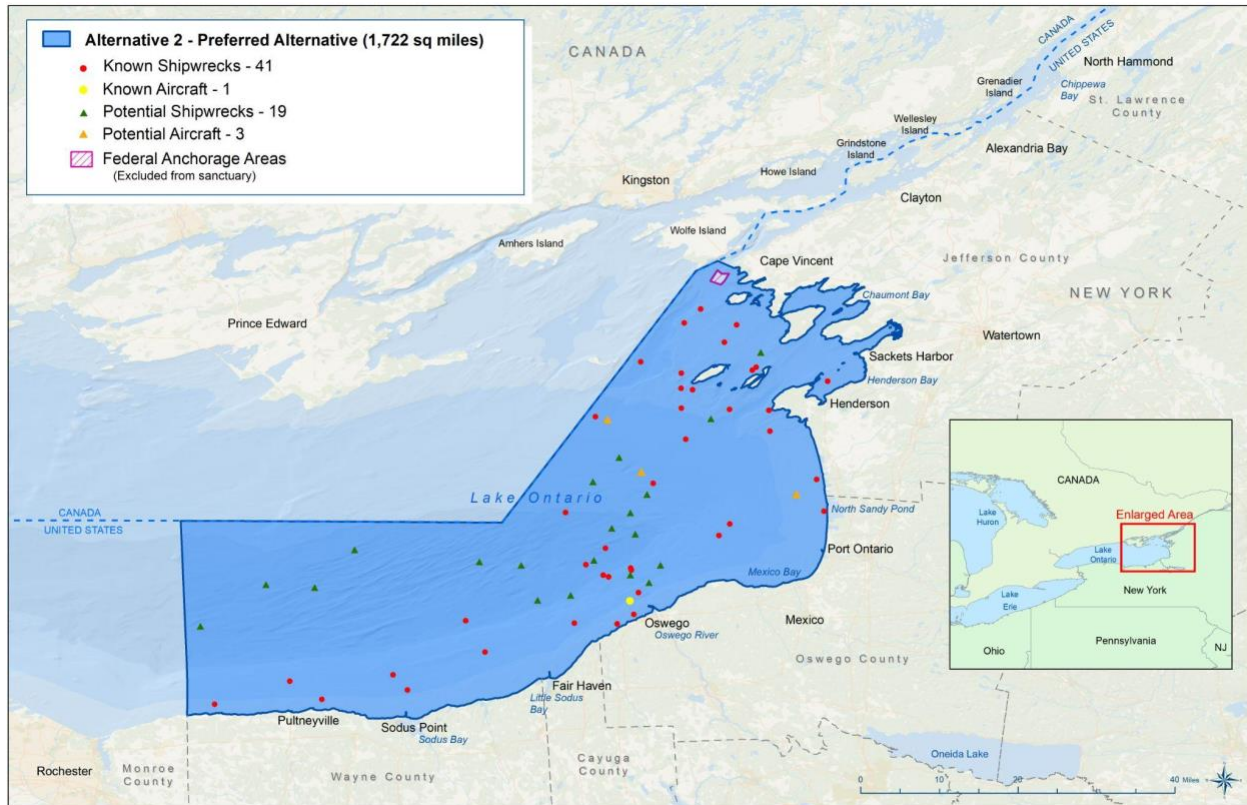


Figure 3.10. Geographic boundaries of Alternative 2 (NOAA's Preferred Alternative), which would cover 1,722 square miles of eastern Lake Ontario. Image: NOAA

For the Lake Ontario shoreline, NOAA would set the shoreline sanctuary boundary at the Low Water Datum (LWD) as defined by the International Great Lakes Datum (IGLD). The LWD is determined by the U.S. Army Corps of Engineers and is the chart datum to which soundings are referenced for NOAA charts in the Great Lakes. The LWD is also well understood internationally because it is a fixed datum for each lake. The state of New York uses the LWD as the line that delineates public land ownership. If designated, the sanctuary boundary would automatically incorporate any changes to the shoreline as defined by the LWD when the datum is updated in the future.

NOAA would set the northern boundary approximately along the U.S. and Canadian border in both Lake Ontario and the entrance to the St. Lawrence River. The western sanctuary boundary would be set approximately along the western border of Wayne County, and the eastern boundary would be a line near the entrance to the St. Lawrence River from approximately the international border between the United States and Canada near Wolfe Island, Ontario to the shoreline near Tibbetts Point Lighthouse to the southwest of the town of Cape Vincent, New York.¹⁴ The remainder of the eastern sanctuary boundary as well as the southern boundary would follow the shoreline around eastern Lake Ontario.

¹⁴ Please refer to Section 1.3.3 and Appendix D: Response to Comments for more detail regarding why NOAA moved the eastern boundary from Cape Vincent to Tibbetts Point Lighthouse.

The final detailed legal sanctuary boundary description and coordinates for the sanctuary will be published in the final rulemaking and codified in the Code of Federal Regulations¹⁵ under the Office of National Marine Sanctuaries' regulations (15 CFR Part 922) in subpart U of part 922.

3.5.1.2 Exclusion of Areas from Proposed Boundary

To ensure compatible use with commercial shipping and other activities, NOAA would exclude the ports and harbors of Oswego, Pultneyville, Little Sodus Bay, Sodus Bay, and Port Ontario. NOAA would exclude the federal navigation channel approaches to these harbors and federal anchorage areas from the proposed sanctuary to avoid unintended effects on port operations critical to the local, regional, and national economies (see Figure 3.2). NOAA would also exclude privately owned bottomlands from the sanctuary. NOAA would include Sackets Harbor in the sanctuary because of the possible presence of underwater cultural and historical resources there.

NOAA's proposed boundary would cut across the mouths of rivers, streams, creeks, and ponds as it continues along the coastline of the proposed sanctuary, which excludes those water bodies from the sanctuary. This is the case for East Bay, Port Bay, Blind Sodus Bay, North Pond, South Colwell Pond, Goose Pond, Floodwood Pond, and Black Pond. Therefore, these bays and their channels to the lake would not be within the boundaries of the sanctuary (see Figures 3.3–3.9).

3.5.1.3 Underwater Cultural and Historical Resources Within the Boundary

As listed in Table 3.2, Alternative 2 would include a total of one known aircraft and 41 known shipwrecks, including one shipwreck (*St. Peter*) listed on the NRHP and another listed as a New York State Submerged Cultural Preserve and Dive Site (*David W. Mills*). Additional underwater cultural and historical resources that may be within the boundaries include approximately 19 potential shipwreck sites (shipwrecks may exist, but additional research is needed to verify and describe these shipwrecks); three aircraft; and several other underwater archaeological sites, including remnants of piers, aids to navigation, historic middens, and historic properties that may be of religious and cultural significance to Indigenous nations and tribes. See Section 4.2 for additional information regarding the historical and cultural importance of these shipwrecks.

Table 3.2. Number of known and potential shipwrecks to be discovered within Alternative 2's boundary, which covers part of eastern Lake Ontario.

Sanctuary Resource	Number of Sites Within Alternative 2
Known Shipwrecks	41
Potential Shipwrecks	19
Known Aircraft	1
Potential Aircraft	3

¹⁵ <https://www.ecfr.gov/current/title-15/subtitle-B/chapter-IX/subchapter-B/part-922#sp15.3.922.j>

3.5.2 Proposed Regulations (Alternative 2-Preferred Alternative)

The regulations under Alternative 2 would be the same as those described above under Alternative 1 (see Section 3.4.2).

3.5.3 Proposed Management Plan and Field Activities (Alternative 2-Preferred Alternative)

The management plan and field activities under Alternative 2 would be the same as those described above under Alternative 1 (see Section 3.4.3).

3.6 Alternatives Considered but Not Carried Forward

3.6.1 Addition of a Noncontiguous Zone to Protect the HMS *Ontario* Shipwreck

The original nomination included a noncontiguous area to protect the wreck of the Revolutionary War-era British warship HMS *Ontario*. The 22-gun ship was launched at Carleton Island in 1780 for use on Lake Ontario during the Revolutionary War. The vessel carried troops and supplies between Fort Niagara, Fort Ontario, and Fort Haldimand (St. Lawrence River). While returning from Fort Niagara in late 1780, the HMS *Ontario* was lost in a storm with all hands. The HMS *Ontario* represents one of the most significant Great Lakes shipwrecks due to its age, state of preservation, and historic significance. The vessel sits upright on the bottom with its two masts intact.

NOAA considered including a noncontiguous zone in the proposed sanctuary to protect the HMS *Ontario*. However, NOAA does not know the location of the wreck at this time. If the proposed sanctuary is designated, NOAA would consider conducting research to search for the vessel with the possible goal of adding this significant shipwreck to the sanctuary in the future. The management plan includes a strategy for the HMS *Ontario*.

Chapter 4: Affected Environment

4.1 Introduction

This chapter describes the resources and human uses within or near the area considered for the national marine sanctuary that could be affected by the proposed action, including alternatives to the proposed action. For the purposes of this final EIS, the affected environment is defined as the human uses of the environment, as well as the natural environment, within eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River, including:

- Maritime heritage significance and underwater cultural and historical resources (Section 4.2)
- Human uses and socioeconomic resources (Section 4.3)
- Physical resources (Section 4.4)
- Biological resources (Section 4.5)

This chapter also serves as the resource assessment of present and potential uses of the area to meet the requirements of Section 304(a) of the NMSA. Additionally, Section 4.2 presents NOAA's identification of historic properties within the area of potential effects for the proposed undertaking, consistent with Section 106 of the NHPA.

This description of the affected environment serves as the baseline for analyzing the environmental consequences of implementing the proposed action and alternatives detailed in Chapter 5.

4.2 Maritime Heritage Significance and Underwater Cultural and Historical Resources

Section 4.2 highlights the historical significance of eastern Lake Ontario and the Thousand Islands region and describes the known and potential underwater cultural and historical resources in the area. This section is organized as:

- Historical background and significance of eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River;
- List of known shipwrecks and aircraft in the area, with some of them highlighted in more detail. Resources in eastern Lake Ontario are presented first, followed by resources in the Thousand Islands region of the St. Lawrence River; and
- List of potential shipwrecks and aircraft and a description of other underwater cultural and historical resources.

4.2.1 Historical Background and Significance of Eastern Lake Ontario and Thousand Islands Region of the St. Lawrence River

Eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River comprise a historically rich area where the long relationship between human activity and the maritime

environment has created meaning and a sense of place. That meaning and sense of place is expressed and preserved in a wide variety of maritime cultural resources, from sacred places and cultural practices to lighthouses and historic shipwrecks. The first regional inhabitants, the ancestors of the Haudenosaunee Confederacy, developed a deep understanding of the lake and its resources, and NOAA acknowledges their cultural and historical significance to this area.¹⁶ Together, these tangible and intangible elements form a rich maritime cultural landscape. The extraordinary collection of historic shipwrecks and underwater cultural and historical resources in the area are a central feature in this cultural landscape.

The region's shores have been inhabited for thousands of years and evidence of early human occupation exists in the area. Additional sites likely exist as well, offering the potential for archaeological survey and investigation, points of collaboration with Indigenous peoples, and new ways of appreciating North America's earliest cultures.

The 63 known historic shipwrecks and one known aircraft in eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River span more than two centuries and possess exceptional archaeological, historical, and recreational value. The collection is bracketed in time by the French-built sailing vessel *Iroquoise* lost during the French and Indian War in 1761, and the 640-foot steel freighter *Roy A. Jodrey*, which sank in 1974. Represented in the collection are vessels from colonial wars and the War of 1812, as well as submerged battlefields at Oswego and Sackets Harbor. Other shipwrecks represent the earliest maritime commerce on the Great Lakes, including the nearly intact sloop *Washington* built in 1797 with its mast standing. As the age of steam arrived in Lake Ontario, innovative local shipbuilders embraced the technology, and these vessels too can be found in the lake, preserving the work of entrepreneurs and craftsmen.

Essential to the interpretation, public appreciation, and management of these tangible links to our nation's past are the historical and cultural contexts within which underwater cultural and historical resources exist. This section provides that context, opening briefly with a wide lens (the Great Lakes system), and then focusing on the prehistory and relevant historical areas of significance. Several shipwrecks and aircraft are highlighted within this section, and a listing of all known and documented historic losses (potential sites) can be found in Tables 4.1 and 4.2.

4.2.1.1 The Great Lakes

Lake Ontario is one of the five North American Great Lakes - the largest group of freshwater lakes on Earth by total area and a natural highway extending over 1,000 miles into the heart of North America. For millennia before European contact, these inland seas served as important lines of trade and communication for Indigenous peoples. Over the past 300 years, these waters have been further utilized by Euro-Americans and have greatly contributed to the growth of North American industry and commerce. Marine transport on the Great Lakes played a crucial role in the European exploration, colonization, and industrialization of the region.

During the 19th and early 20th centuries, the Great Lakes evolved from a self-contained maritime network into the nation's busiest commercial waterway, where innovative ships and

¹⁶ For more information on the d and the Haudenosaunee's historical connection to Lake Ontario, refer to https://www.onondaganation.org/wp-content/uploads/2021/05/Lake_Ontario_Onondaga.pdf

technologies moved raw materials and agricultural products in larger quantities and at lower costs than at any previous time in history (Figure 4.1). During this period, entrepreneurs and shipbuilders on the Great Lakes launched tens of thousands of ships of many different designs. Sailing schooners, grand palace steamers, revolutionary propeller-driven passenger ships, and industrial bulk carriers transported America's business and industry. In the process, they brought hundreds of thousands of people to the Midwest and drove the dramatic growth of the region's farms, cities, and industries.

The Midwest, and indeed the United States, could not have developed with such speed and vast economic and cultural impacts without the Great Lakes. Lake Ontario's history is intimately tied with the broad historical patterns of human activity across the Great Lakes system. However, as the eastern-most of the five Great Lakes (and until the early 1800s essentially cut off from the "upper lakes" by Niagara Falls), Lake Ontario has a distinctive history that sets it apart from the rest of the Great Lakes.

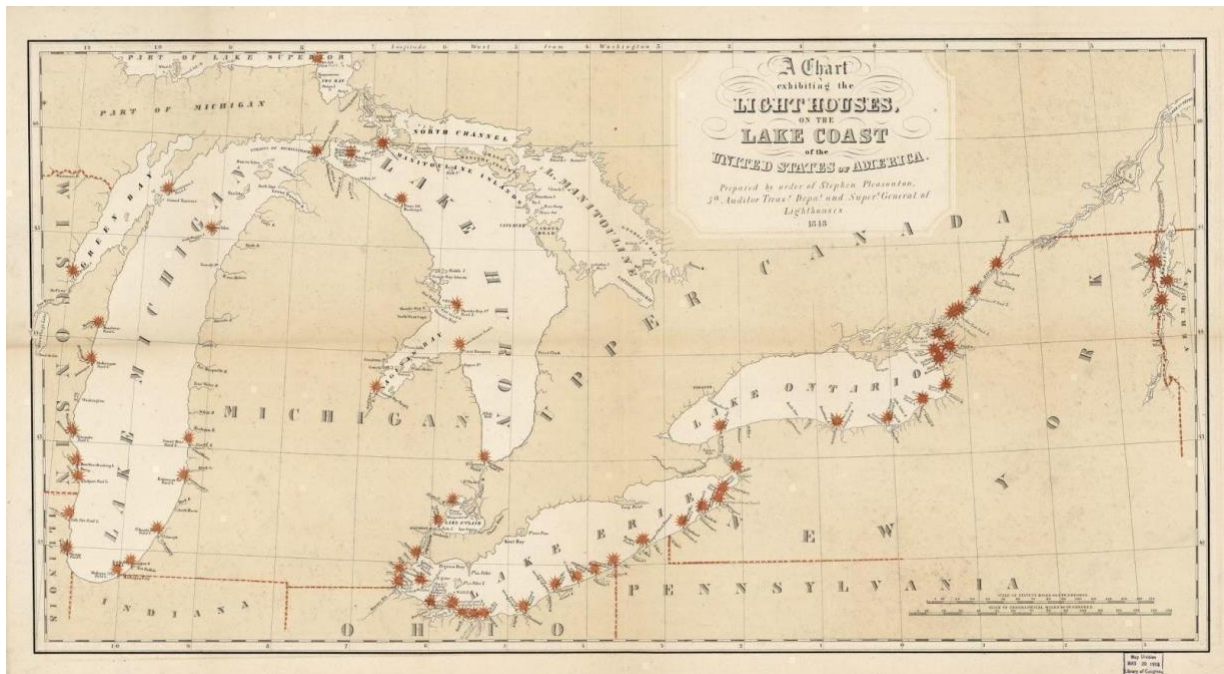


Figure 4.1. A map showing lighthouse locations on four of the Great Lakes in 1848. The magnitude of this infrastructure—essentially constructed to ensure the uninterrupted flow of commerce—speaks to the early economic importance of the Great Lakes. Today, about 160 million tons of cargo, valued at \$15 billion, moves annually on the Great Lakes according to the Lake Carriers' Association. Image: Library of Congress

4.2.1.2 Indigenous Cultures

Following the retreat of North American glaciers, vast tracts of land across New York state supported spruce forests, grasslands, and megafauna, including herds of caribou, mammoths, and mastodon (Halligan, 2011; Bradley, 2020). Lake Iroquois, the glacially formed precursor to Lake Ontario, covered much of the current study area as water levels were approximately 100 feet higher. Archaeological evidence from then-shoreline sites suggest early regional occupants were living in close proximity to the water and may have been building watercraft to access lacustrine resources (Schulz et al., 2011). As glaciers continued to retreat, lake levels dropped

rapidly, forcing populations to follow the changing shoreline. Today, this intermediate shoreline dating to approximately 9,000 years before present (BP)¹⁷ is located under the waters of Lake Ontario. Difficulty in surveying and accessing these areas has resulted in little archaeological evidence of human settlement (Halligan, 2011).

Approximately 5,000 years BP, the changing landscape once again restructured resources around Lake Ontario. Lake levels began rising towards their modern average, again forcing coastal populations further inland (Ford, 2018). Despite these environmental changes, communities persisted through reliance on diverse subsistence practices. From 2,500 to 500 BP, small communities occupied the shores of Lake Ontario and the surrounding river valleys. During this period, pottery appears at terrestrial archaeological sites, as does evidence of early agricultural practices. Fishing, too, was a dietary staple leading Ritchie and Funk (1973) to suggest that canoes were a primary means of regional transportation. Indeed, waterways are transportation highways that facilitated the exchange of goods and information and maintained cultural alliances (Ritchie and Funk, 1973; Ford, 2018).

By 1,000 years BP, the distinct cultural groups living along the lake shoreline had unified as the Haudenosaunee Confederacy under the Great Law of Peace instituted by the Peacemaker (Onondaga Nation, 2019). The Haudenosaunee Confederacy, known as the People of the Longhouse, is made up of the Kanien'kehá:ka (Mohawk), OnAyota'a:ka (Oneida), Onoa'géga (Onondaga), Gayogohno' (Cayuga), Ondowa'ga:' (Seneca), and Ska:rrę' (Tuscarora) nations. Maritime tools and resources are central features in the Peacemaker's work and governance of the early Confederacy. The Peacemaker created a canoe to transport both himself and his message of peace to the founding nations—the Mohawk, Oneida, Onondaga, Cayuga, and Seneca. The use of canoes to bring the nations together continued with Grand Council meetings held at the conflux of the Oneida, Seneca, and Oswego River systems (Onondaga Nation, 2019). Similarly, the wampum belt (constructed from marine shells obtained through trade networks) was instituted by Hiawatha during the time of the Peacemaker to unify the five nations (Figure 4.2). Wampum belts continued in use as tools for recording Haudenosaunee laws, history, and political interactions (Smithsonian National Museum of the American Indian, 2009). The wampum practice continues today.

¹⁷ Years Before Present (BP) refers to a time scale used by geologists and archaeologists among other scientists in different fields of studies to denote an event that took place in the past. January 1, 1950, is typically taken as the starting date of the time scale, indicating the 1950s as the time when scientists began using the technology of radiocarbon dating.



Figure 4.2. A replica of the Hiawatha wampum depicting the Five Nations of the Haudenosaunee Confederacy. Image courtesy of the National Museum of the American Indian (Catalog Number: 26/9056)

Haudenosaunee maritime practices conducted throughout the 17th and 18th centuries include sailing, fishing, canoeing, canoe building, ice-fishing, netting, and weir construction (Recht, 1997; Bradley, 2020). Archaeological remains associated with these craft traditions and resources have been documented on lakeshore areas adjacent to Lake Ontario and the St. Lawrence River and in contemporary historical sources. Increased underwater archaeological survey (coupled with technological advances) may yield additional archaeological evidence of these practices within these waters.

The Treaty of Canandaigua (1794) between the Haudenosaunee Confederacy and the United States guaranteed control of Haudenosaunee lands and waterways to the Six Nations of the Haudenosaunee Confederacy.¹⁸ Today, the Haudenosaunee remain the Indigenous stewards of Lake Ontario, its connected waterways, and surrounding lands (Onondaga Nation, 2019). Portions of the original homelands of the Onondaga Nation, Cayuga Nation, Seneca Nation of Indians, and Oneida Nation (St. Lawrence River) lie within this area. The Haudenosaunee relationship with Lake Ontario pre-dates European arrival in the New World and is significant to understanding the connection between people and place—past and present.

4.2.1.3 European Arrival, Colonial Powers, and Nations at War

Although European explorers and fur traders reached Lake Ontario by the early 1600s, the southern lakeshore remained under Haudenosaunee control throughout that century, with Indigenous nations conducting the majority of lake commerce and transportation. Following the Great Peace Treaty in 1701, the French and Haudenosaunee forged a trading alliance that saw French missions established along preexisting Haudenosaunee trade routes, including the Oswego and Salmon rivers.

Like many European powers, both the French and the Dutch financed exploratory missions to document and exploit resources in the New World. Understanding that aligning with Indigenous nations was key to surviving in these lands, many explorers forged alliances and fur trading partnerships with Indigenous communities. However, increasing European demand for furs (transported largely via water routes) inflamed preexisting tensions and led to a series of

¹⁸ In 1772, the Tuscarora people became the Sixth Nation of the Haudenosaunee Confederacy.

conflicts known today as the Beaver Wars. Further, as British colonists encroached on Lake Ontario's southern shore, the arrival of a second colonial power both reinforced the French-Haudenosaunee alliance and brought new tensions to maritime trading.

By 1755, increasing British colonial interest drove the construction of Fort Ontario at Oswego as a means of defending Britain's claim to Lake Ontario against the French. During the ensuing Seven Years' War (1756–1763), of which the French and Indian War (1754–1763) was a specific campaign in the North American colonies, the British sought to destabilize French and Haudenosaunee shipping routes, while the French targeted British vessels and Fort Ontario—resulting in the 1756 Battle of Fort Oswego. Lake Ontario and its shoreline became a battlefield. Ultimately, Great Britain prevailed and the French ceded to the British crown at the war's end.

During the Revolutionary War (1775–1783), British control of regional waterways expanded to include Fort Haldimand and its shipyard located on the St. Lawrence River. While no naval battles occurred on Lake Ontario during the Revolutionary War, it remained a hub for British naval activity. At the end of the war, many resources in New York state were turned over to the United States, yet Loyalists and British soldiers remained on the St. Lawrence River and in Kingston, Ontario—the latter being a mere 50 miles from Oswego. The remaining British military presence set the stage for conflict with a new American nation.

In 1812, the United States declared war on Great Britain and Lake Ontario once again became a hub of naval activity. Outnumbered by British vessels on the lake, American shipwrights undertook a frenzied shipbuilding campaign that led to a naval arms race between the United States and British Canada. Sackets Harbor developed a naval depot and shipyard for the war effort while Fort Ontario became a key staging area for supplies and ordnance. British forces targeted both of the ports, although they would remain under American control through the end of the War of 1812 (1812–1815) (Figure 4.3).

Three vessels related to the War of 1812 are likely located within the region, one of which is known. The American armed sailing vessel USS *Jefferson*, built at Sackets Harbor in 1814, saw brief action. Stored at Sackets Harbor at the end of the war, by 1825 the derelict vessel was fully abandoned. Investigated in the 1980s by archaeologists, USS *Jefferson* remains significant to our understanding of American shipbuilding during the war. It is possible to walk out on the marina docks and see portions of the hull lying on the marina bottom, making this vessel a tangible part of our national heritage (Ford personal communication, 2020). This shipwreck is on private property and is not considered a sanctuary resource.

Two other potential War of 1812 naval vessels are reported within the region: *Lady of the Lake*, a schooner that saw action in several battles and USS *Oneida*, which also saw action and was reportedly sunk in the St. Lawrence River after the war. An additional two shipwrecks contemporary to the War of 1812 may also be in the area: the schooners *Commodore Perry* (sunk 1820) and *Appelona* (sunk 1822). Though merchant craft, they were part of the increased American shipbuilding effort and would offer further insight into specialized regional vessel form and function. Discovering these wrecks would provide new links to the War of 1812 and early United States history.



Figure 4.3. **ATTACK on FORT OSWEGO, LAKE ONTARIO, N. AMERICA. May 6.th 1814**, by Robert Havell (1769–1832). Royal Collection Trust. Found at this website.

When the war concluded in 1815, America's energy turned to economic development of eastern Lake Ontario, emphasizing industry and shipping over naval superiority. The area's military significance, however, would re-emerge during World War II (WWII) (1939–1945), with pilot training over eastern Lake Ontario. As a part of the Allied war effort, both upstate New York and Canada housed training facilities for aviators, and Fort Ontario was a U.S. Army training site, hospital, rehabilitation center, and refugee camp. Lake Ontario's fierce storms claimed three training aircraft by the war's end. Two American and one Canadian aircraft were lost over the lake between 1942 and 1944: a U.S. Army Air Force (USAAF) Douglas C-47 Skytrain transport, USAAF B-24 Liberator bomber, and Canadian Royal Air Force Avro Anson trainer aircraft. Both the Liberator and Avro Anson crews remain unaccounted for. One post-WWII aircraft, too, was lost in 1952 during a training exercise. This USAAF Beechcraft C-45 Expeditor was located by local shipwreck explorers in 2014 and is within recreational diving depth.

4.2.1.4 Shipbuilding and Shipwrights

Intimately tied with the maritime culture of eastern Lake Ontario are the region's shipyards, whose owners and workers made the commercial and economic expansion of the region and nation possible. Oswego boasts one of the Great Lakes' earliest shipbuilding traditions, beginning in 1755 with the establishment of Fort Oswego. By the end of the War of 1812, Oswego, Sackets Harbor, and Storrs Harbor shipbuilders were constructing a wide variety of vessels, from sailing schooners and sloops to sidewheel steamers, tugs, and yachts. Vessels built in the regions of Oswego and Sackets Harbor account for six shipwrecks and eight potential shipwrecks within the area. Approximately 45 vessels built by other shipyards in the region also wrecked within the area.

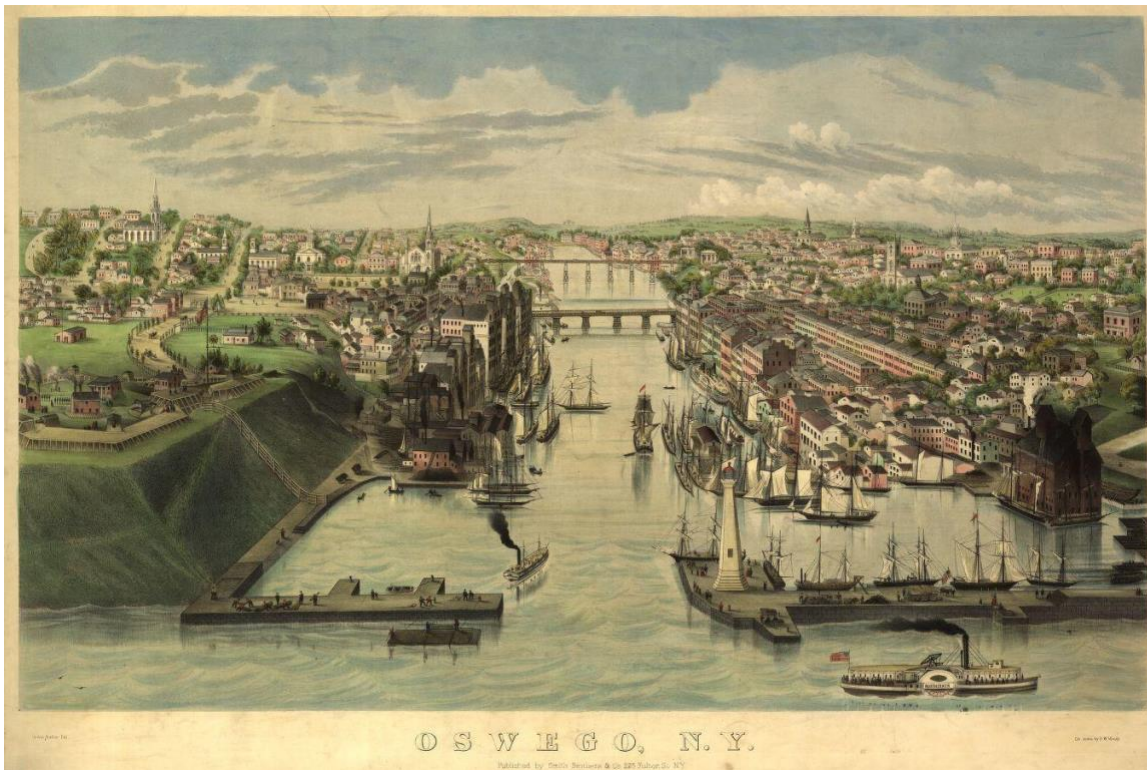


Figure 4.4. Oswego was a busy port in 1855. Image: Library of Congress

One of the most prolific shipwrights in Oswego was Andrew Miller, an Irish immigrant who arrived in New York State in the 1830s (Figure 4.4). His shipyard and sawmill operated between the early 1840s and 1876, producing at least three vessels wrecked within the area: schooner *Comanche* (salvaged and refitted), steam tug *Tornado*, and schooner *Carthaginian*. As bulk cargo carriers, *Comanche* and *Carthaginian* traveled between Lakes Michigan and Ontario, ensuring that raw materials from the Midwest made it to eastern cities. Notably, bulk cargo carriers account for the majority of mid-19th century vessels plying the region's waters.

In December 1867, *Carthaginian* went ashore while trying to enter Oswego Harbor. Strong gales ripped the bowsprit from the vessel, and the hull soon filled with water. Stranded on the deck overnight, the crew was rescued from the vessel the next morning. In the following days, the grain cargo began spilling from the hull, prompting many residents to visit the beached wreck.

Though the shipwreck was salvaged, its story, and the many others like it, play an essential role in the interpretation of historic shipwrecks and our appreciation of past generations.

As an industrial waterway, eastern Lake Ontario also required smaller vessel types, such as barges and tugs, to ensure the safe and efficient passage of cargoes. Barges and tugs dredged critical areas for shipping, towed vessels in distress, and assisted with salvage. Well-known on the waterfront, the steam tug *Tornado*, launched from Andrew Miller's shipyard in 1862 (Figure 4.5). Beyond harbor duties, the tug aided several shipwrecked crews and is frequently cited in newspapers as providing assistance to stranded vessels. While the vessel has not been found, the reported wrecking location suggests that parts of *Tornado* may lie within the area's waters.

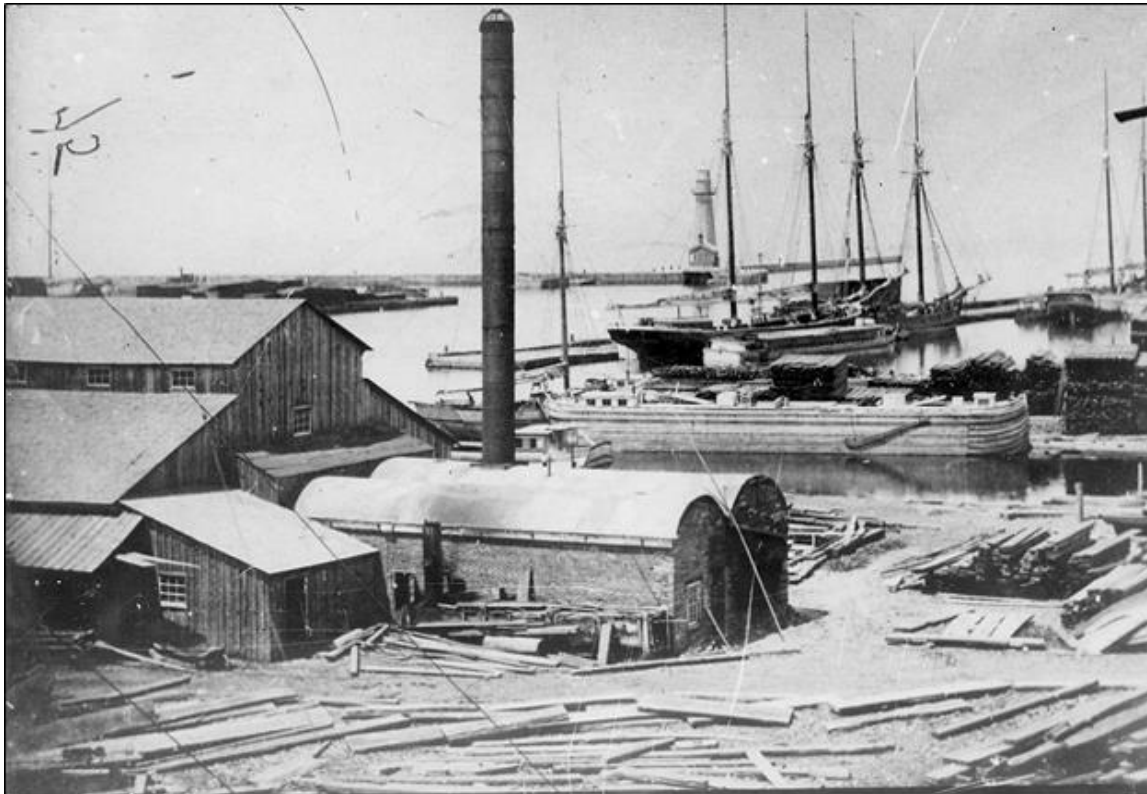


Figure 4.5. Photograph of the Miller Shipyard at Oswego, New York, ca. 1865-1875. Image is part of the Richard Palmer collection curated [online](#) by Walter Lewis

Through the lens of history and sanctuary resources, important and colorful local figures also emerge. At age 13 Horatio N. Throop (1807–1884), from Pultneyville, worked with local shipwrights to construct small craft. In 1826 at the age of 19, he built his first schooner, *Sophia*, which carried bulk goods from Canada to New York. While returning to New York with a cargo of corn the following year, the wooden vessel began taking on water, finally sinking four miles from shore. Captain Throop survived, swimming the distance to shore, and was soon at work on his next vessel. Following *Sophia*'s sinking, Throop also assisted shipwrecked mariners from the wreck of *Phoebe*, a Canadian schooner.

Throughout Throop's career as a shipwright and entrepreneur, he successfully adapted to change, and his early experimentation with steam propulsion led to its successful use on several Great Lakes vessels. The Throop-built steamers *Ontario* and *Bay State* operated throughout

eastern Lake Ontario and the St. Lawrence River, although they were eventually lost. In the last years of his life, Throop's passion for shipbuilding followed the changing maritime trends on Lake Ontario. His final project, construction of the steam yacht *Magic* (Figure 4.6), later burned at its dock in Mexico Bay.

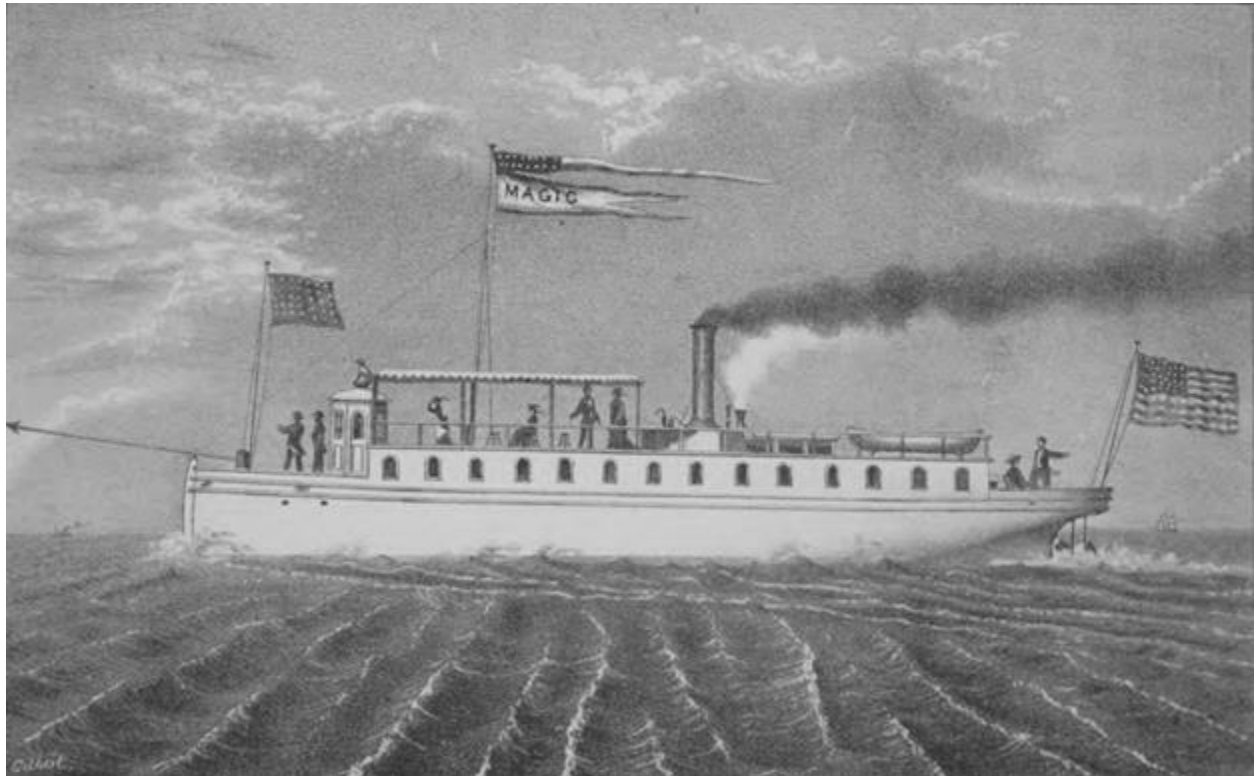


Figure 4.6. Illustration titled *Steam Yacht MAGIC*. Designed, Built & Owned by H.N. Throop, Pultneyville, Wayne Co., NY by Williamson. Image: History of Wayne County, New York (1877:190)

4.2.1.5 Historic Salvage and Diving

Throughout history, salvage has been a central element of the maritime world, and communities on the eastern shore of Lake Ontario have a long history of commercial diving and salvaging shipwrecks to reuse and repurpose their materials.

By the second half of the 1800s, several commercial salvage companies operated on eastern Lake Ontario. The often dangerous work of refloating, repairing, and quickly returning a stranded vessel to use was their primary aim. When a vessel was total loss, efforts turned to salvaging cargoes, rigging, machinery, and anything else of value. Divers were used when a wreck was completely submerged, as with the schooner *St. Peter*, built in 1873. While transporting coal from Oswego to Toledo in late October 1898, *St. Peter* foundered in a gale off Sodus, New York. The following year, the site was rediscovered by the South Shore Wrecking Company, which hoped to recover the body of the captain's wife. Investigation of the site, located in 120 feet of water, was a feat for 19th century diving technology. Numerous local residents accompanied the wrecking crew to the site to see the diving rig and salvage operations. While the recovery was unsuccessful, divers worked at the site through the summer, salvaging

rigging and reducing the standing masts, as the site was a hazard to navigation. In 1971, divers rediscovered the site, and it is a popular attraction today (Figure 4.7).



Figure 4.7. The bow of the schooner *St. Peter*. The nearly intact shipwreck rests in 120 feet of water, well preserved by Lake Ontario's cold, fresh water. Photo: NOAA

Several commercial vessels were successfully raised or refloated from the area. Vessels returned to service from the lakebed include the propeller *Wisconsin* (sank 1867), the paddlewheel steamer *Watertown* (wrecked 1865; recovered and rebuilt 1866), and the propeller *Rosedale* (washed ashore 1897). For divers salvaging the steambarge *Ellsworth* off Stoney Island, no amount of fortitude could save the hull. After catching fire in 1877, the vessel settled close to shore in 20 feet of water. The following year, the owner returned to the site with a crew equipped to raise the hull. While the divers successfully recovered the engine, the vessel, badly burned, broke in two at the surface and fell once again to the lakebed. The local dive community located the remnants of both *Wisconsin* and *Ellsworth*.

4.2.1.6 Additional Significance of the Thousand Islands Region of the St. Lawrence River

The Thousand Islands region of the St. Lawrence River is, of course, geographically distinct from, but also connected to, eastern Lake Ontario. Consequently, its history and culture are also distinct and connected. While the St. Lawrence River has always been used for transportation and commerce, changing American attitudes towards recreation and vacationing transformed the Thousand Islands region during the late 19th and early 20th centuries. As tourists flocked to the riverside communities from larger population centers, a robust maritime industry centered around small pleasure craft, passenger ferries, river cruises, and yacht races soon followed. Eight of the 22 shipwrecks in the proposed St. Lawrence River boundary are associated with

19th and 20th century recreation and tourism. While some of these wreck events only involved financial losses, such as the burning of the passenger steamer *Islander* at its dock, others were far more tragic. The collision and subsequent sinking of the pleasure yacht *Catherine* in 1890, for example, stirred local sentiments as only seven of the 12 passengers on board survived the wreck. A local salvage diver recovered the remaining passengers, a feat for the novice diver given the wreck's 70-foot depth.

4.2.2 Underwater Cultural and Historical Resources

This section describes the underwater cultural and historical resources in eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River. While shipwrecks are the more numerous underwater cultural and historical resources in the area, the collection of underwater sites that would become sanctuary resources is diverse. These underwater sites have significant historical, archaeological, and recreational value. As eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River each have distinctive histories and underwater cultural and historical resources, they are discussed separately in this chapter.

4.2.2.1 Known Shipwrecks and Aircraft in Eastern Lake Ontario

Forty-one historic shipwrecks and one aircraft have been located within eastern Lake Ontario. The shipwrecks and aircraft discussed below are a representation of known sites within this area, and presented with build/sinking dates in parentheses. The full list of known sites and documented historic losses (potential sites) within eastern Lake Ontario can be seen in Tables 4.1 and 4.2, respectively. Please refer to Section 3.3.1.1 for more information about NOAA's methodology for developing these lists.

Table 4.1. Known shipwrecks within the proposed Lake Ontario boundary. The column "site access" denotes the minimum depth required for divers to access the site. For the purposes of this research, snorkel depths are those less than 15 feet (5 meters), recreational diving limits are set to 130 feet (40 meters), and technical diving limits extend from 130 feet to 330 feet (40–100 meters). Any depth beyond 330 feet is considered outside diver limits.

Vessel Name	Vessel Type	Use Dates	Site Access
<i>American</i>	Schooner	1870–1894	Recreational Diving
<i>Ariadne</i>	Schooner	1867–1886	Snorkeling
<i>Atlas</i>	Schooner	1836–1839	Extreme Technical Limits/ Outside Diver Limits
<i>Bay State</i>	Propeller	1852–1862	Technical Diving
<i>Black Duck</i>	Scow-sloop	1859–1872	Outside Diver Limits
Beechcraft C-45 <i>Expeditor</i>	Aircraft	Sank 1952	Technical Diving
Canal Boat 1	Canal boat	19th Century	Outside Diver Limits
Canal Boat 2	Canal boat	19th Century	Technical Diving
<i>City of New York</i>	Propeller	1863–1921	Technical Diving
<i>Cormorant</i>	Propeller tug	1941–1958	Recreational/Technical Diving

Vessel Name	Vessel Type	Use Dates	Site Access
Dagger-board Schooner	Schooner	1820s/1830s	Outside Diver Limits
<i>David W. Mills</i>	Propeller	1874–1919	Snorkeling/Recreational Diving
<i>Ellsworth</i>	Barge	1869–1879	Recreational Diving
<i>Etta Belle</i>	Schooner	1851–1873	Technical Diving
<i>Rum Runner</i>	Steam Yacht	Sank 1895	Recreational Diving
Wooden Vessel	Wooden Vessel	19th Century	Snorkeling/Recreational Diving
<i>Gordon</i>	Dredge	Sank 1879	Outside Diver Limits
<i>H. B.</i>	Schooner-barge	1890–1912	Recreational Diving
<i>Hartford</i>	Schooner	1873–1894	On Shore
<i>Hiawatha</i>	Barge	1890–1917	Recreational Diving
Historic Barge	Barge	Late 19th/Early 20th Century	Recreational Diving
<i>Homer Warren</i>	Propeller	1863–1919	Technical Diving
House Boat	House Boat	20th Century	Recreational Limits
<i>Isaac G. Jenkins</i>	Schooner	1873–1875	Outside Diver Limits
<i>J. W. Langmuir</i>	Schooner	1865–1875	Recreational Diving
<i>James Buckley</i>	Schooner-barge	1884–1912	Recreational Diving
<i>Washington</i>	<i>Sloop</i>	1797–1803	Technical Diving
<i>Mary Kay</i>	Propeller diesel tug	1957–1988	Recreational Diving
<i>Northstar</i>	Schooner	1854–1886	Recreational Diving
<i>Ocean Wave</i>	Schooner	1868–1890	Outside Diver Limits
Napoleon	Schooner	1833 –1835	Recreational Diving
Tug William Gardner	Steamer	????–1883	Recreational Diving
<i>Orcadian</i>	Brig	1854–1858	Outside Diver Limits
<i>Queen of the Lakes</i>	Schooner	1858–1906	Outside Diver Limits
<i>Roberval</i>	Propeller	1907–1916	Presumed Technical Dive/ Outside Diver Limits
<i>Royal Albert</i>	Schooner	1858–1868	Outside Diver Limits
Onondaga	Schooner-barge	1870 –1907	Technical Diving
<i>St. Peter</i>	Schooner	1873–1898	Recreational Diving

Vessel Name	Vessel Type	Use Dates	Site Access
<i>Three Brothers</i>	Schooner	1827–1833	Presumed Technical Diving or Outside Diver Limits
<i>T.J. Waffle</i>	Propeller scow	1914–1919	Presumed Outside Diver Limits
U.S. Coast Guard Boat 56022	Landing craft	1942–1977	Recreational Diving
<i>William Elgin</i>	Schooner	1871–1888	Outside Diver Limits

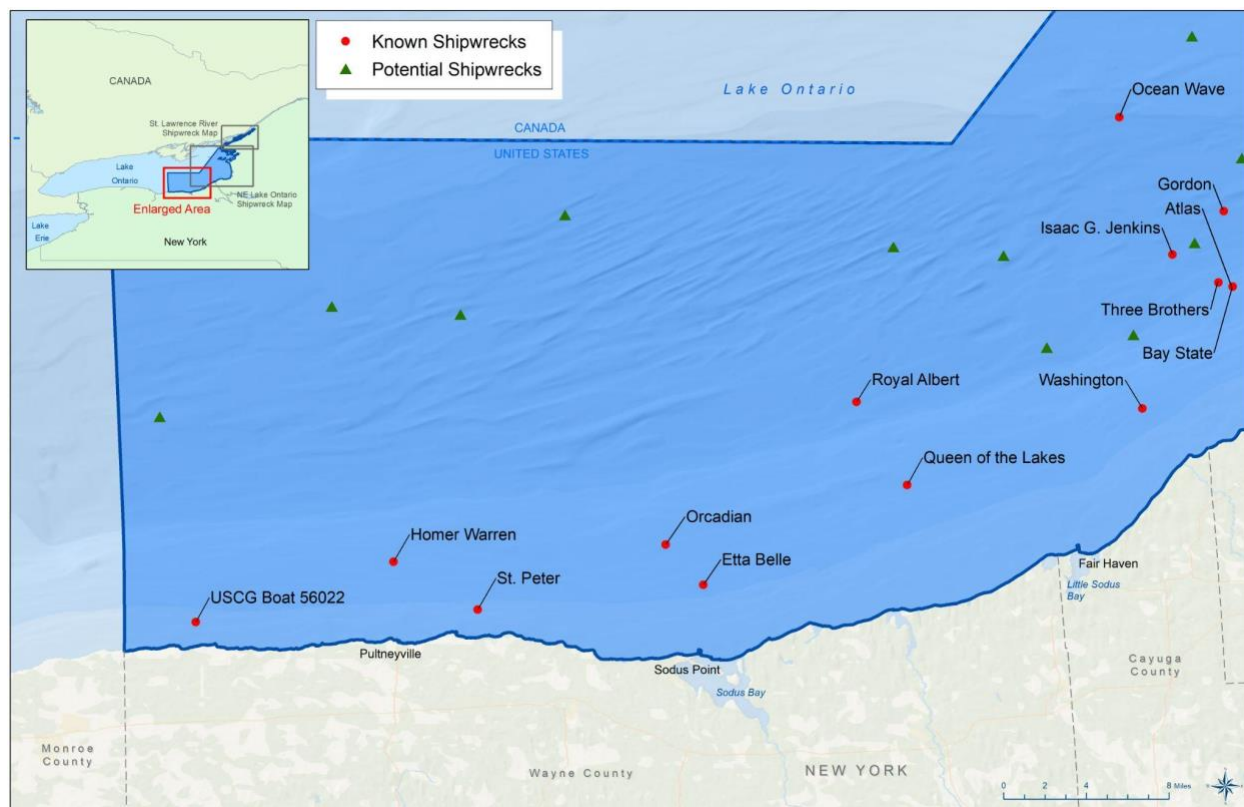


Figure 4.8. Map of known and potential shipwreck and aircraft locations off the coast of Wayne and Cayuga counties. These are approximate locations. Image: NOAA

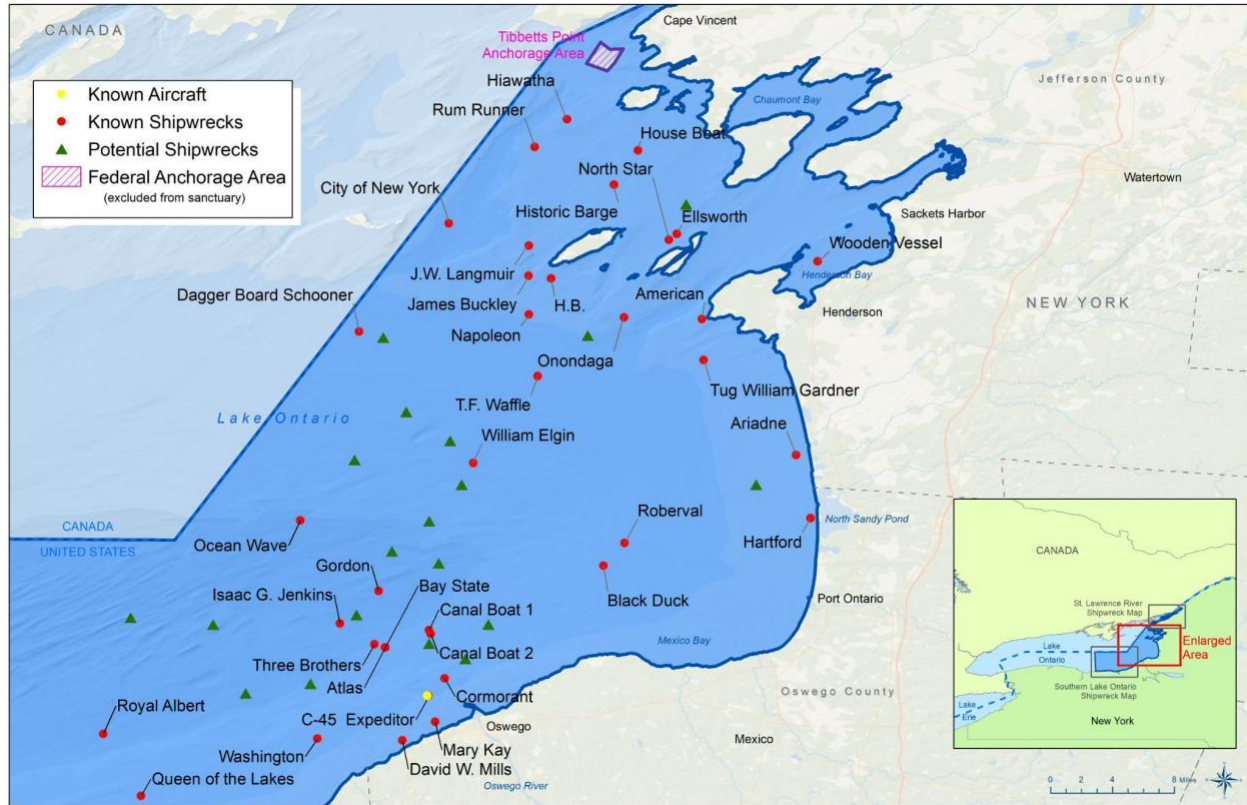


Figure 4.9. Map of known and potential shipwreck and aircraft locations off the coast of Oswego and Jefferson counties. These are approximate locations. Image: NOAA

Washington (1797–1803)

The earliest known shipwreck in the proposed Lake Ontario boundary is *Washington*, a Pennsylvania-built sloop (Figure 4.10). Purchased for use on the lake in 1801, the sloop brought goods between Canadian and American ports. During a trip across the lake in 1803, the sloop disappeared and was presumed lost with all on board. For the next two hundred years, the vessel sat undiscovered on the lakebed. Using a remotely operated vehicle to obtain video, local shipwreck explorers discovered the site in 2016. The discovery team believes the sloop *Washington* to be the oldest confirmed commercial sailing ship to be discovered in the Great Lakes. The wreck is largely intact with masts still standing. Given its state of preservation and age, the shipwreck has significant archaeological potential.



Figure 4.10. Model of an Early American sailing sloop, ca. late 18th Century. Model crafted by Arthur G. Henning Inc., New York. Photo: Division of Work and Industry, National Museum of American History/Smithsonian Institution.

USS Jefferson (1814–1825)

Built by the Americans at Sackets Harbor in 1814, the brig *USS Jefferson* is an important link to the War of 1812. Following the war, the vessel was used for local regional transport until it was laid up in storage at Sackets Harbor. As time passed, *USS Jefferson* fell into disrepair and was never raised or refitted. Archaeologist Kevin Crisman investigated the site and it remains a significant resource to understanding American shipbuilding during the War of 1812.

Unfortunately, due to the shallow water and harbor development, only the lower portion of *USS Jefferson*'s hull remains on the lakebed. This shipwreck is on private property and is not considered a sanctuary resource.

Three Brothers (1827–1833)

One of the early locally built commercial vessels on Lake Ontario is *Three Brothers*, built at Henderson, New York in 1827. Captain John Stevenson of Williamson, New York, commanded the new dagger-board schooner. *Three Brothers* disappeared in a storm while en route to Oswego from Pultneyville with a cargo of apples, cider, and wheat. Local residents assumed the worst when the tiller and a barrel of apples were found on shore. Local shipwreck explorers located the wreck in 2014, using the clearly-visible dagger-board to help confirm the wreck's identity. To date, it is the oldest commercial schooner discovered in the Great Lakes. The shipwreck is remarkably well-preserved given its age and has significant archaeological potential.

Bay State (1852–1862)

An early 19th century steamer, *Bay State* operated on Lakes Erie, Michigan, and Ontario. Built at Buffalo, New York, the steamer operated as part of the Northern Transportation Company, carrying passengers and cargo throughout New York and the Midwest. *Bay State* wrecked during a strong storm off Oswego while en route to Lake Erie. The entire crew was lost,

including five Oswego residents. Discovered by local shipwreck hunters in 2015, the wreck of *Bay State* lies in technical diving depths. The hull of *Bay State* remains upright but shows some natural deterioration.

***Queen of the Lakes* (1858–1906)**

Built as a Canadian schooner for Great Lakes commerce, *Queen of the Lakes* operated throughout Lakes Michigan, Erie, Huron, and Ontario for nearly 50 years, an exceptional length of time for a schooner. During its lifespan, repairs were required every 15–20 years to ensure that the hull and machinery remained seaworthy. Despite these efforts, the schooner sprang a leak during a November storm in 1906 while returning to Kingston, Ontario, with a cargo of coal. The hull began to roll and soon foundered, leaving the crew to row their small yawl boat in the midst of a gale 15 miles to shore in the middle of the night. *Queen of the Lakes* remained preserved and undisturbed in the deep cold waters of the lake for another century until it was discovered in 2011 by local shipwreck explorers. Technical divers visited the schooner, and reported a remarkable state of preservation (Figure 4.11).

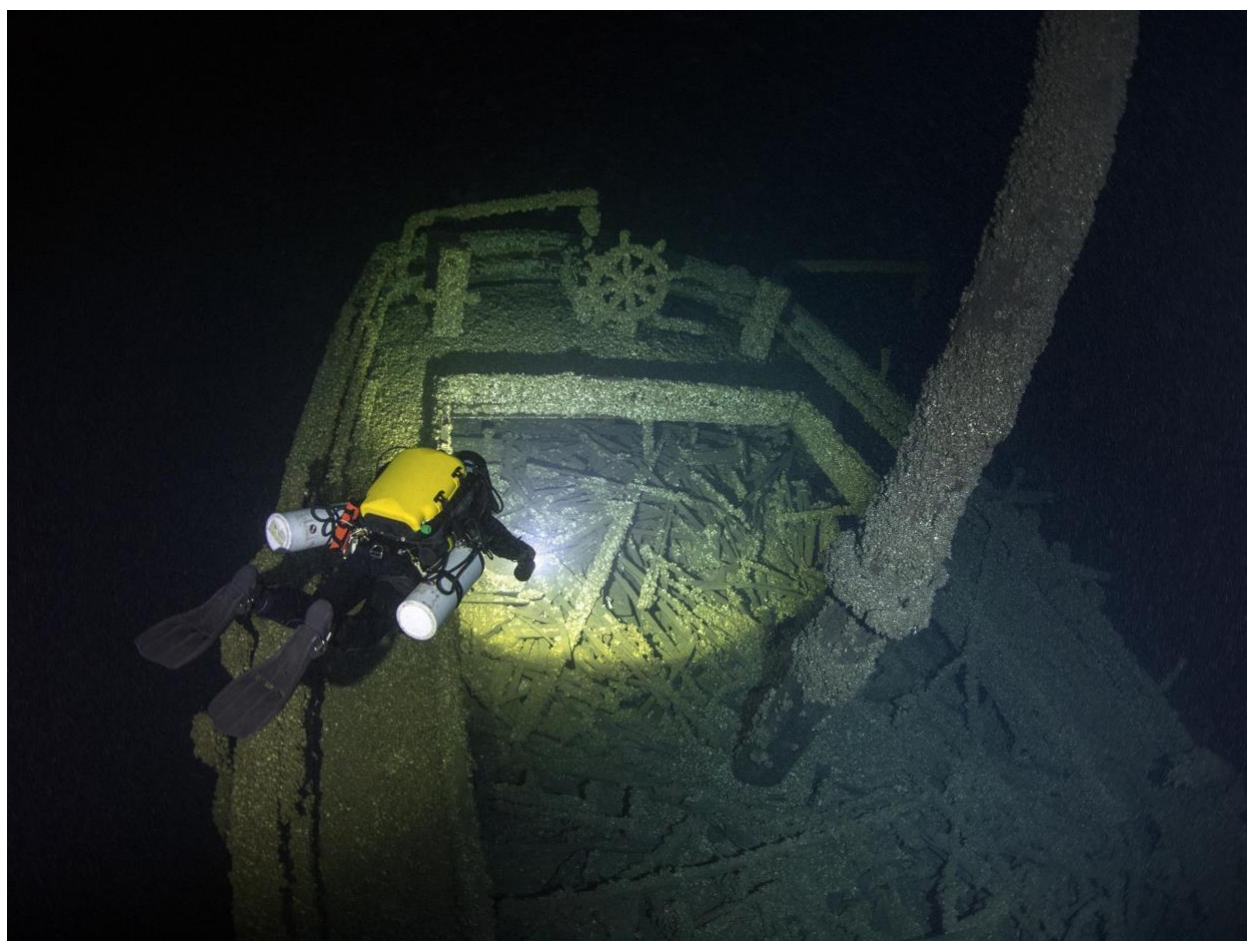


Figure 4.11. The stern of the schooner *Queen of the Lakes*. Photo: Jill Heinerth

Ellsworth (1869–1877)

Built at Seneca Lake, New York, as a sailing vessel, *Ellsworth* was later outfitted as a steam vessel that traversed both the Great Lakes and inland river systems around New York. After catching fire in 1877, the vessel settled close to shore at Stony Island in 20 feet of water. The following year, the owner returned to the site with a wrecking expedition to raise the hull. While divers successfully recovered the engine, the vessel, badly burned, broke in two at the surface and returned to the lakebed. Recently, a side-scan sonar survey conducted off Stony Island located the remains of *Ellsworth*. Due to the machinery salvage and partial raising, the hull remains split and partially collapsed. The shipwreck has important historical ties to the area's history of salvage and commercial diving.

American (1870–1894)

Over the course of its 24-year career, the schooner *American* saw four owners as it operated throughout Lake Ontario and Lake Erie. Converted as a barge towards the end of its career, the vessel gave additional assistance to ships that required tug boats. In the fall of 1894, *American* headed for Prescott, Ontario, from Oswego began to sink off the Galloo Island light. The crew escaped to the steamer *Hall*; however, *American* was a complete loss. During a remote sensing survey in 2008, remains were potentially identified but not visited until 2014. Much of the wreck remains intact today, making it an excellent dive site in recreational depths.

St. Peter (1873–1898)

The schooner *St. Peter* foundered in a gale in 1898 with only the captain surviving. The site was actively salvaged in 1899 and rediscovered by divers in 1971. The site is listed on the National Register of Historic Places, which recognizes its historic and cultural significance (Figure 4.12). The Williamson-Pultneyville Historical Society displays artifacts from the wreck. Located in 120 feet of water, the well-intact hull of the wreck makes for an excellent recreational dive.

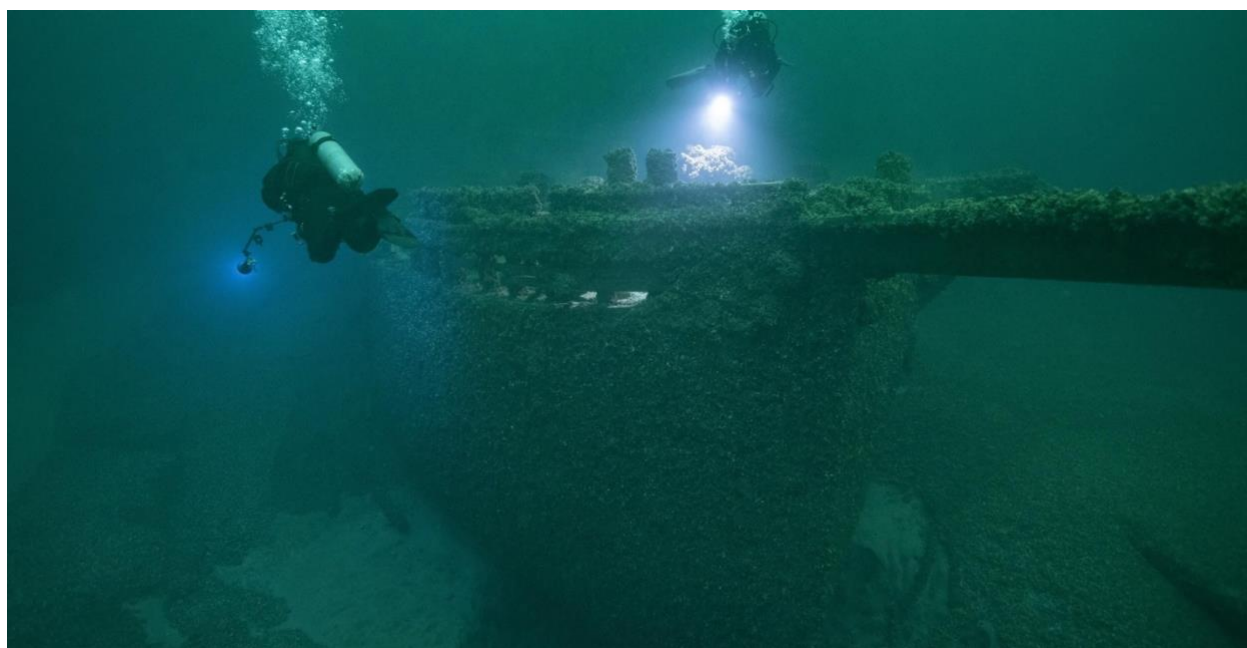


Figure 4.12. Divers inspect the well-preserved schooner *St. Peter*, located in 120 feet of water. Photo: NOAA

***Hartford* (1873–1894)**

William Linn and John Craig built the schooner *Hartford* at Gibraltar, Michigan. Designed for commercial trade in the Great Lakes, the three-masted schooner was soon registered in Oswego, New York, carrying bulk cargoes of agricultural products and coal. In October 1894, *Hartford* traveled from Detroit, Michigan, to Cape Vincent, New York, when it was caught in an October storm off Mexico Bay. A lookout at the Big Sandy Life Saving Station noticed the vessel drifting towards shore and roused the station crew. As they watched the vessel, it began to roll violently in the water. Parts of the masts and rigging broke off and washed ashore, followed by larger fragments of the vessel. Over the next few days, all the attempts to reach *Hartford* were unsuccessful and the hull was abandoned where it sank offshore, claiming the lives of the entire crew, including the captain, his wife, and their infant daughter. The wreck drew huge crowds to the beach, many of whom wanted a glimpse of the ill-fated vessel.

Months after the initial wrecking, *Hartford* continued to inspire the local community who published poetry or memories of the vessel and lost crew members. The following spring, divers relocated the wreck and began salvaging its cargo of wheat. Today, *Hartford* is one of the most accessible sites within eastern Lake Ontario (Figure 4.13). In March 2020, a portion of *Hartford* washed ashore near Sandy Creek and was visible in the surf zone. Due to the dynamic nearshore environment, this portion is often covered entirely with sand, but may re-emerge with future storms and seasonal changes. The site is considered an archaeological resource protected by New York state law.

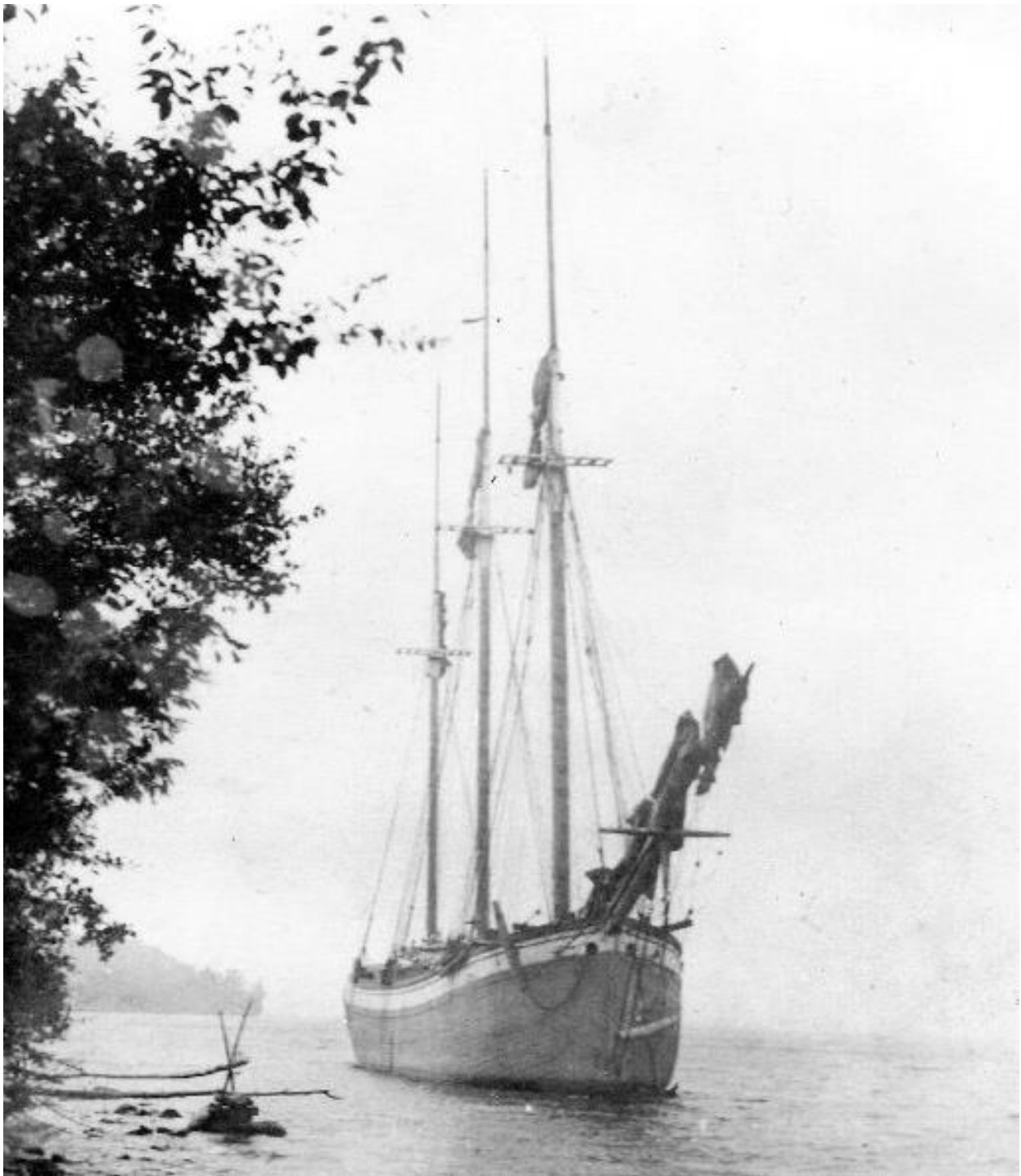


Figure 4.13. Photograph of *Hartford*, ca. 1890, taken above Blake's Point, Lake Ontario. Image: Thousand Islands Museum

***David W. Mills* (1874–1919)**

Built in Cleveland, Ohio, the propeller *David W. Mills* operated for an incredible 45 years as a bulk cargo carrier on the Great Lakes and St. Lawrence River (Figure 4.14). In August 1919, as *David W. Mills* traveled from Montreal to Sodus, New York, heavy smoke from nearby forest fires obscured the Oswego light and the vessel struck Ford Shoal at full speed. Given the severity of the damage to the wooden steamer, the captain and crew remained on board until insurance underwriters could visit the wreck. Two wrecking companies visited the scene; however, the damage was fatal. Ultimately, the vessel broke in two with the hull coming ashore. Local community members were encouraged to recycle the beached portion into lumber. A Cleveland wrecking company eventually returned to the water-logged portion to remove parts of the steam machinery. Today, the remains of *David W. Mills* are still located next to Ford Shoal. The state of New York designated the site in 2000 a Submerged Cultural Preserve and Dive Site.



Figure 4.14. Photograph of *David W. Mills* taken by Louis Pesha, ca.1910. Image: Great Lakes Maritime Collection, Alpena County George Fletcher Public Library

Beechcraft C-45 Expeditor (1952)

The Beechcraft C-45 Expeditor aircraft (Figure 4.15) was an American training aircraft model used during and after World War II. While on a training run in 1952 from Rome, New York, this twin-engine C-45 Expeditor experienced a single engine failure, but reportedly flew for another 65 miles on the remaining engine. The crew and passengers on board bailed out while the aircraft itself crashed into Lake Ontario. The aircraft, located by local shipwreck explorers during a remote sensing survey in 2014, sits within recreational diving limits.



Figure 4.15. A C-45 in flight. Image: U.S. Air Force

4.2.2.2 Known Shipwrecks in the Thousand Islands Region of the St. Lawrence River

This section describes the known underwater cultural and historical resources found within the Thousand Islands portion of the St. Lawrence River. Twenty-two known historic shipwreck sites are located in this area and span a range of 210 years (Table 4.2). A select number of shipwrecks are discussed below.

Table 4.2. Known Shipwrecks in the Thousand Islands region of the St. Lawrence River. The column “site access” denotes the minimum depth required to access the site firsthand. For the purposes of this research, snorkel depths are those less than 15 feet, recreational diving limits are set to 130 feet, and technical diving limits extend from 130 feet to 330 feet. Any depth beyond 330 feet is considered outside diver limits.

Vessel Name	Vessel Type	Dates of Use	Site Access
<i>America</i>	Drill Barge	1908–1932	Recreational Diving
<i>A.E. Vickery</i>	Schooner	1861–1889	Recreational Diving
Box Stove Wreck	Sloop	Late 19th Century	Recreational Diving
Calumet Island Wreck	Lifeboat	20th Century	Recreational Diving
<i>Catherine</i>	Steam Yacht	1882–1890	Recreational Diving
<i>Dauntless</i>	Yacht	1906–Post-1921	Recreational Diving
<i>Elk</i>	Schooner	Sank 1874	Snorkeling/Recreational Diving
<i>General Hancock</i>	Ferry	1890s	Shorebased/Snorkeling/ Recreational Diving
<i>Giggle</i>	Powerboat	Early 20th Century–1929	Technical Diving
<i>Grand View</i>	Steamer	1899–1906	Recreational Diving
<i>Iroquoise/HMS Anson</i>	Bark (re-rigged as Brig)	1759–1761	Recreational Diving
<i>Islander</i>	Steamer	1871–1909	Recreational Diving
<i>Keystorm</i>	Steamer	1908–1912	Recreational Diving
<i>Maggie L.</i>	Schooner	1889–1929	Recreational Diving
North Colborne Island Barge	Barge	Unknown	Recreational Diving
<i>Oconto</i>	Steam Propeller	1872–1886	Technical Diving
<i>Raymond</i>	Yacht	Sank 1925	Recreational Diving
<i>Roy A. Jodrey</i>	Freighter	1965–1974	Technical Diving
<i>Sir Robert Peel</i>	Steamer	1837–1838	Recreational Diving/Technical Diving
Wooden Work Boat	Motorboat	Post-1910	Recreational Diving
<i>St. Louis</i>	Barge	1864–1914	Snorkeling/Recreational Diving
Steam Launch	Steam Launch	Unknown	Recreational Diving

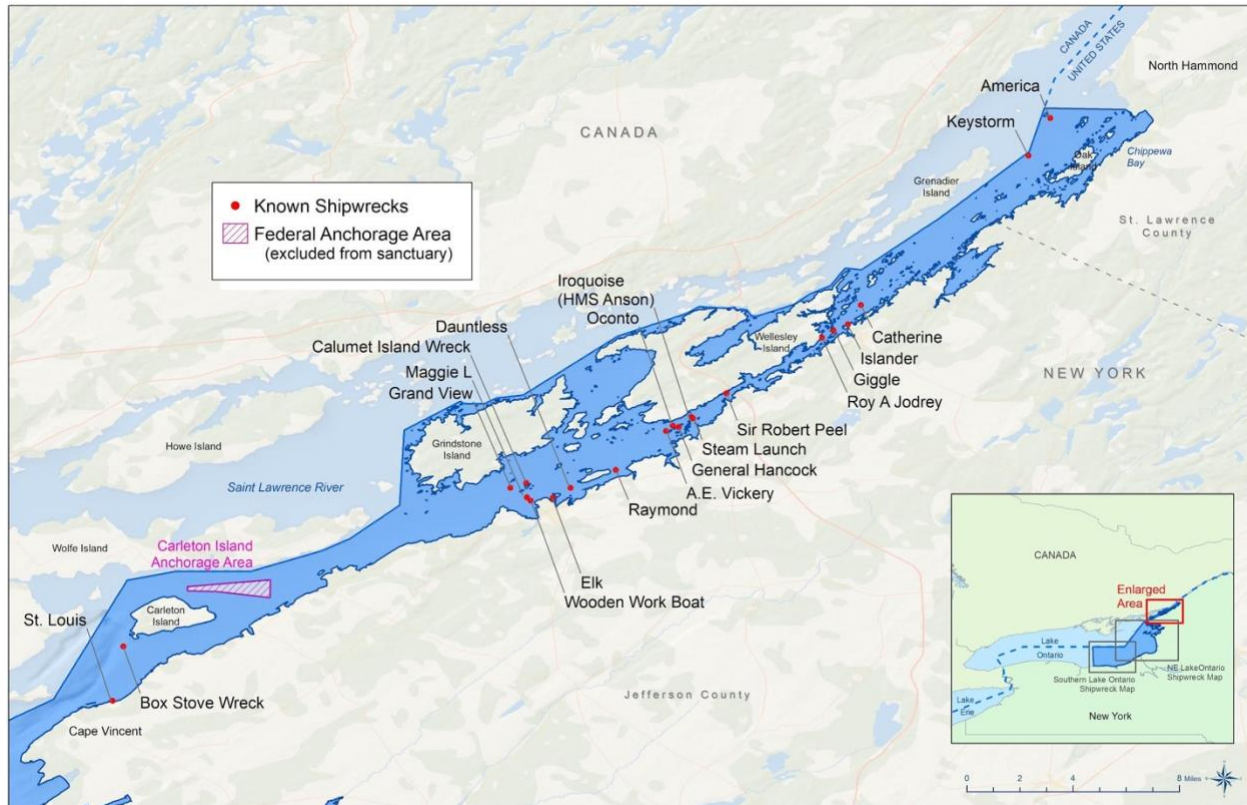


Figure 4.16. Map of known shipwreck locations in the Thousand Islands region of the St. Lawrence River. These are approximate locations. Image: NOAA

Iroquoise/HMS Anson (1759–1761)

Built by the French during the Seven Years' War, the 75-foot sailing vessel *Iroquoise* served on Lake Ontario following the fall of Fort Frontenac in 1758. Damaged in February 1760, the French abandoned the vessel, and British forces repurposed and renamed it *Anson* six months later. While traveling on the St. Lawrence River, the HMS *Anson* struck Niagara Shoal and could not be saved. The British salvaged what they could and burned the wreck to the water line. Today, the site is the oldest known shipwreck in the Thousand Islands region and is located in 80 feet of water. Volunteers for the St. Lawrence River Historical Foundation documented the wreck in the late 1990s.

Sir Robert Peel (1837–1838)

Built as a steamer in Brockville, Ontario, *Sir Robert Peel* operated between the St. Lawrence River and Lake Ontario. After only a year of service, an angry mob that was retaliating for the loss of a Canadian vessel, seized the steamer at an American dock. The mob stripped the vessel, escorted passengers to shore, and then burned it to the waterline. The act, part of ongoing hostilities between British Canada and New York, occurred during a period known as the "Patriot Wars." While the hull is located in 125 feet of water, the boiler is located at a depth of 70 feet. Given the fire that occurred on board, only the bottom of the hull remains today.

***A.E. Vickery* (1861–1889)**

Built as a bulk cargo carrier by local shipbuilder Asa Wilcox at Three Mile Bay, New York, the schooner *A.E. Vickery* launched as the *J.B. Penfield* in 1861. Following a successful career, *A.E. Vickery* went ashore near Alexandria Bay in 1889 carrying a cargo of corn bound for Chicago. Although the hull reportedly filled quickly with water, the crew were able to escape to the nearby Rock Island Lighthouse. Unable to raise the wreck, a local diver salvaged it. The diver, who required a U.S. marshall to “seize” the wreck so it could be salvaged, outfitted the marshall in a dive suit in order for him to make the seizure “in true naval style” (Daily British Whig, 1890). *A.E. Vickery* is an advanced dive site located in 115 feet of water. While much of the site is still intact, the deck and hull are very fragile.

***Oconto* (1872–1886)**

Built at Manitowoc, Wisconsin, in 1872, the steamer *Oconto* sailed out of Detroit, Michigan, where it carried packaged goods throughout the Great Lakes (Figure 4.17). While traveling along the St. Lawrence River, *Oconto* struck Granite Shoal and sank. Contemporary newspaper clippings cite the shoal as treacherous, as it caused at least two other accidents. The sinking itself took several hours, and all passengers and crew were evacuated. Over the next decade, salvors returned to the site on many occasions to recover the cargo of silk cloth and the ship’s vessel fittings. In 1900, an attempt was made to recover the hull. During the recovery process, the hull slid further down the shoal and today sits in over 140 feet of water. Today, there are two primary portions of the wreck with easily distinguishable features, such as the bow and anchor.

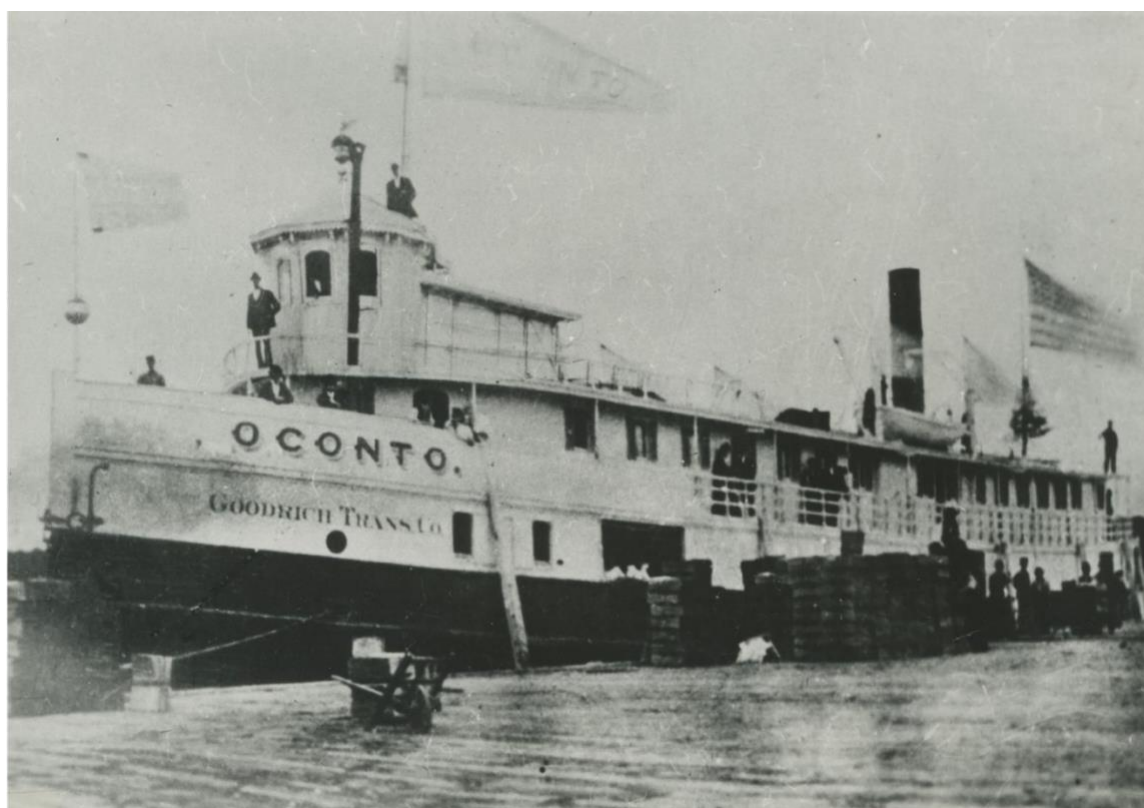


Figure 4.17. The steamer *Oconto* at dock in 1872. Image: Great Lakes Maritime Collection, Alpena County George Fletcher Public Library

Grand View (1899–1906)

Registered as a passenger steamer, *Grand View*, built in 1899 at Clayton, New York, operated on the St. Lawrence River. In late October 1906, the steamer's anchor began to drag, resulting in *Grand View* sinking offshore of Little Clumet Island. Only the boiler and deck machinery could be salvaged from the wreck, and the hull was left in place where it remains today in 35 feet of water. Some deterioration is evident; however, the lower hull is still largely intact.

Keystorm (1908–1912)

Built in England, the 250-foot steel-hulled *Keystorm* operated out of Canada carrying coal for the Keystone Transportation Company. In October 1912, the steamer struck Black Spar Shoal in the early morning hours. Finding themselves aground, the crew came ashore to contact the company offices. However, while awaiting response, *Keystorm* slipped off the shoal and rolled, taking on water in the process. The hull filled quickly, sinking the vessel in 100 feet of water. Salvage divers soon found the wreck and began to strip the hull of valuable materials. Today, the wreck is one of the most popular dive locations in the St. Lawrence River due to its high state of preservation and range of depths. *Keystorm* lies on the sloping river bottom at a depth of 25 to 115 feet.

America (1908–1932)

Constant development and maintenance of shipping infrastructure was key to successful commerce and transportation along the St. Lawrence River. In 1932, the H.C. Huffman Construction Company brought in the drillboat *America* to deepen the channel near Dark Island. While preparing dynamite charges, a premature explosion occurred on the boat, killing seven of the crew on board. Passing vessels rendered assistance to crew members in the water, but the drillboat was a total loss. Salvage divers located the wreck but did not recover or refloat the hull. Today, the wreckage sits within recreational dive limits and is a popular dive site.

Roy A. Jodrey (1965–1974)

The 640-foot freighter *Roy A. Jodrey* carried iron ore for just nine years before it sank. While traveling through the St. Lawrence River in 1974, *Roy A. Jodrey* struck Pullman Shoal. Members of the Wellesley Island Coast Guard station successfully rescued the crew. However, *Jodrey*, fatally damaged, settled on the sloping riverbed in 150-250 feet of water. Salvage operations to retrieve the iron ore cargo were conducted the following year, leading to a commercial diver's death. In the early 2000s, the site became popular among technical divers due to its relatively intact structure and depth (Figure 4.18).



Figure 4.18. A diver explores the wreck of the 640-foot steamer *Roy A. Jodrey*, located in the St. Lawrence River. Resting on the sloping river bottom from 150 to 250 feet of water, the site is popular among technical divers. Photo: NOAA

4.2.2.3 Potential Shipwrecks, Aircraft, and Other Underwater Cultural and Historical Resources in Eastern Lake Ontario

Nineteen shipwreck sites and three aircraft sites are potentially located in eastern Lake Ontario, waiting to be rediscovered (Table 4.3). For the purposes of this section, “potential shipwrecks and aircraft” includes those sites that have not yet been located, but according to historical records are likely within eastern Lake Ontario. Due to the lake’s long history of settlement, transportation, and recreation, additional types of archaeological sites may also be located on the lakebed. These may include prehistoric sites, historic battlefields, debris fields from wrecking and salvage events, and aids to navigation, such as buoys, lighthouse foundations, and channel markers. As these types of archaeological sites can be more difficult to locate and identify than shipwrecks, targeted survey operations are required to supplement historical and archival research.

Table 4.3. Potential Shipwrecks and Aircraft in eastern Lake Ontario. The column “site access” denotes the minimum depth required to access the site firsthand. For the purposes of this research, snorkel depths are those less than 15 feet, recreational diving limits are set to 130 feet, and technical diving limits extend from 130 feet to 330 feet. Any depth beyond 330 feet is considered outside diver limits.

Vessel Name	Vessel Type	Use Dates	Site Access
<i>Algie O. Thayer</i>	Propeller tug	1872–1879	Outside Diver Limits
<i>Annie M. Foster</i>	Schooner	1875–1889	Presumed Outside Diver Limits
<i>Appelona</i>	Schooner	1814–1822	Presumed Outside Diver Limits
<i>Avro Anson</i>	Aircraft	Lost 1942	Presumed Outside Diver Limits
<i>Commodore Perry</i>	Schooner	1815–1820	Presumed Outside Diver Limits
<i>E. Hall</i>	Schooner	1863–1879	Presumed Outside Diver Limits
<i>E.J. Vickery</i>	Canal boat	1868–1874	Presumed Outside Diver Limits
<i>E.B. Gannett</i>	Schooner	1864–1870	Presumed Outside Diver Limits
<i>Getaway Gertie (B-24)</i>	Aircraft	1943–1944	Presumed Outside Diver Limits
<i>Iona</i>	Propeller	1892–1912	Presumed Outside Diver Limits
<i>Jeska</i>	Propeller	1909–1926	Presumed Outside Diver Limits
<i>Lady of the Lake</i>	Schooner	1813–1826	Presumed Outside Diver Limits
<i>Maggie Hunter</i>	Schooner	1862–1876	Presumed Outside Diver Limits
<i>Neptune</i>	Schooner	1842–1850	Presumed Outside Diver Limits
<i>Perseverance</i>	Propeller	1864–1868	Presumed Outside Diver Limits
<i>Philip Becker</i>	Steam tug	1876–1879	Presumed Outside Diver Limits
S/N 42-24120 (C-47)	Aircraft	1944–1944	Presumed within Recreational Limits
<i>Shannon</i>	Scow-schooner	1867–1874	Presumed Outside Diver Limits
<i>Tornado</i>	Steam tug	1862–1870	Presumed Technical Dive or Outside Diver Limits
<i>Twilight</i>	Scow-schooner	1858–1859	Presumed Outside Diver Limits
<i>W. T. Sherman</i>	Sloop	1869–1877	Presumed Recreational Diving
<i>William John</i>	Schooner	1865–1872	Presumed Outside Diver Limits

USS *Lady of Lake* (1813–1826)

The USS *Lady of the Lake* was built at Sackets Harbor as a U.S. revenue enforcer, with a design similar to revenue cutters. Armed with five guns (or cannons) during the War of 1812, the USS *Lady of the Lake* served as a merchant vessel after the war. The vessel left Niagara, New York, in 1826 for Oswego but never arrived. It was later determined that the vessel sank in deep water off Oswego. Given its location in deep water, this site may be intact.

***Sophia* (1826–1827)**

Built by Horatio N. Throop at the age of 19, *Sophia* operated as a cargo schooner on Lake Ontario, hauling bulk goods between New York and Canada. While returning to New York in 1827, the schooner's cargo of corn swelled from water in the hold and the vessel sprang a leak, sinking four miles from shore. Throop, the sole survivor of the wreck, swam the four miles to shore and proceeded on foot to the closest town for help.

***Neptune* (1842–1850)**

Asa Wilcox, a master shipwright and blacksmith, operated his own shipyard at Three Mile Bay, New York, from 1835–1853. During this period, he built a number of vessels including the schooner *Neptune*. During its career, *Neptune* sailed out of Sackets Harbor. In 1850, after eight years of service, *Neptune*, traveling north from Oswego, encountered a severe storm that arose over the lake. The crew of the schooner *D.W. Church* recalled *Neptune* leaving port shortly before *D.W. Church* itself set out. Offshore of Oswego, those on board *D.W. Church* caught a brief glimpse of a small yawl-boat that might belong to a schooner. As *D.W. Church* maneuvered itself into a better position to approach the yawl-boat, the small boat disappeared entirely from view. Piecing accounts of the storm together, it was later decided that *Neptune* had likely capsized and sank during the storm. The crew, escaping to the yawl boat, was lost in the rough weather. Although not found, the remains of *Neptune* are thought to exist in deep water off Oswego.

Tug *Tornado* (1862–1870)

Andrew Miller with Willard Kitts and Thomas Moore built the steam tug *Tornado* at Oswego, New York, in 1862. During its career, *Tornado* aided several shipwrecked crews and is frequently cited in newspapers as providing assistance to stranded vessels. Tragedy for the vessel and crew struck in the summer of 1870. While waiting to tow vessels into Oswego Harbor, the crew on board *Tornado* stopped the tug's steam engine to save fuel. When the engine was restarted, the boiler malfunctioned and exploded, destroying the vessel's bow and engine room and killing three of the crew. While not found, the reported wrecking location suggests that *Tornado*'s stern may lie within eastern Lake Ontario.

***Getaway Gertie*, USAAF Consolidated B-24 Liberator Bomber (1942)**

During World War II, the U.S. Army Air Force (USAAF) used the Consolidated B-24 Liberator bomber stateside as a training aircraft (Figure 4.19). While on a routine flight from Massachusetts to Syracuse, New York, a winter storm enveloped the B-24 *Getaway Gertie*. Unable to see the airstrip, the aircraft stayed aloft over Syracuse. With fuel running low, the pilot ordered the crew to bail over Lake Ontario. While a wing segment later washed up outside Oswego, the aircraft and crew have never been found.



Figure 4.19. B-24 Liberator in flight. Image: U.S. Air Force.

4.2.2.4 Potential Underwater Cultural and Historical Resources in the Thousand Islands Region of the St. Lawrence River

Ten historic archaeological sites are potentially located within the Thousand Islands region of the St. Lawrence River. Many of these sites relate to the Victorian era and are small pleasure craft (many of which were not recorded as lost or sunk), submerged middens (dump sites) associated with shoreline development, and associated artifacts. Additionally, prehistoric cultural resources, such as middens and shoreline features, are reported within the Thousand Islands region. Documented in the historic record or by divers, these wrecks and archaeological sites require further verification (see Chapter 3).

4.2.3 Historic Properties

Historic property, as defined under the NHPA, means any prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in the NRHP maintained by the Secretary of the Interior. This term includes artifacts, records, and material remains that are related to and located within such properties. Properties of traditional religious and cultural importance to an Indigenous nation or tribe or Native Hawaiian organization may be determined eligible for inclusion in the National Register (36 CFR 800.16(l)(1)).

The wreck of *St. Peter* is the only NRHP listed property within eastern Lake Ontario. Many of the other shipwreck sites that are in the affected environment (described above) would likely be eligible for NRHP listing due to their historical and archaeological significance.

4.3 Human Uses and Socioeconomics

4.3.1 Overview

The natural, recreational, historical, and cultural resources located in eastern Lake Ontario and the Thousand Islands region contribute to its economy, support a vibrant quality of life, and create a unique sense of place. This section describes the socioeconomic characteristics of eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River, including human uses in the area. NOAA uses these data to help illustrate how human uses, including recreational and commercial uses and the local economy, may be affected by the designation of a new national marine sanctuary (see Chapter 5 for a discussion of impacts to these sectors).

NOAA examined the socioeconomic resources and economic effects in a study area that includes both primary and secondary counties in eastern Lake Ontario and the Thousand Islands region.

“Primary” denotes counties that lie adjacent to the boundaries of alternatives 1 and 2.

“Secondary” generally denotes counties that have more than 10% of their workforce commuting to or from a primary county. The primary counties in this analysis are Jefferson, Oswego, Wayne, and Cayuga, and the secondary counties are Onondaga, Ontario, and St. Lawrence Counties (Figure 4.20). While St. Lawrence County would ordinarily qualify as a primary county because it borders the boundary in Alternative 1, NOAA categorized it as a secondary county in this analysis because the sanctuary boundary would only overlap with one mile of the county.

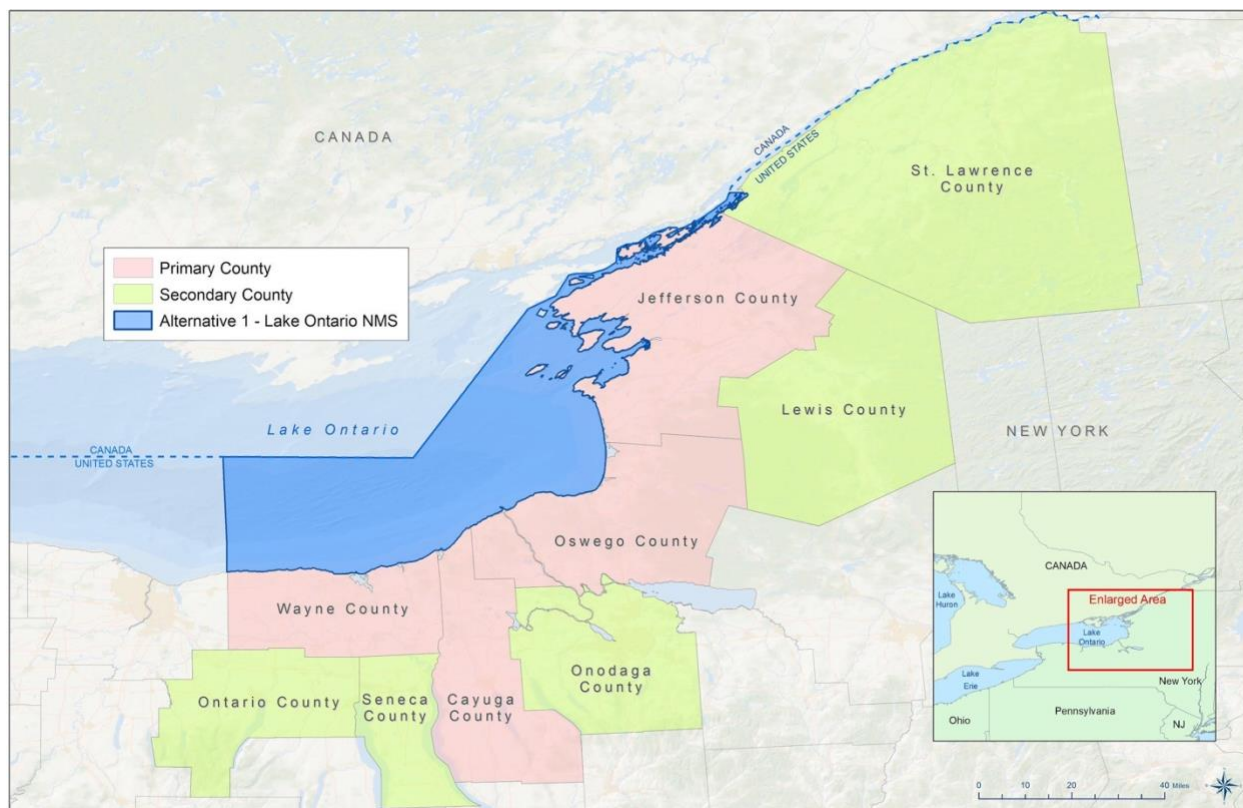


Figure 4.20. Proposed Lake Ontario National Marine Sanctuary study area counties. Image: NOAA

4.3.2 Human Uses

4.3.2.1 *Tourism and Recreation*

The Lake Ontario coast attracts tourists, who come for the area's fishing, boating, and natural beauty, and to visit the network of historic lighthouses and dive the many shipwrecks. An important factor in determining the economic contribution of an existing or proposed sanctuary to a region is visitation. If people are visiting the sanctuary, it means they are also contributing to the regional economy by spending money within the region on food, accommodations, travel, and other commodities. The more people that visit the sanctuary, the more economically dependent the region may be on the resources of the sanctuary, and the more important it becomes to manage the sanctuary carefully. Trends in visitation can also give information about trends in the quality of sanctuary resources and their interpretation. If resource quality is improving, visitation is likely to increase; if resource quality is declining, fewer people are likely to visit. Additionally, as name recognition of a place increases, the sanctuary is likely to attract more visitors.

In a designated sanctuary, NOAA would collect visitor use data to understand how many people visit the sanctuary, what types of people visit the sanctuary, where they came from, and what activities they participate in while visiting the sanctuary (e.g., scuba diving, boating, or fishing). However, this information does not currently exist for the study area, as there is no sanctuary in eastern Lake Ontario and the Thousand Islands region. If a sanctuary is designated in this area, NOAA would collect visitor use data.

While there are no direct visitation numbers available for the study area, there are parks on the coast that track annual visitation to their sites. In this section, visitation numbers for these parks are used as a proxy for the potential number of visitors to the proposed sanctuary and the type of direct reach that NOAA may have through signage, visitor centers, and interactive exhibits. However, it is not accurate to assume that all visitors to the parks referenced below would be visitors to the proposed sanctuary. Instead, this information can be viewed as an indicator of potential trends in use.

There are 57 state parks in the study area, which attracted an average of 3.6 million visits annually from 2003 to 2018. The parks with the highest average levels of visitation were Green Lakes State Park, Hamlin Beach State Park, and Fair Haven Beach State Park. While not all are along the shoreline of Lake Ontario, all of these parks have both an outdoor recreation and water element similar to Lake Ontario. Annual park visitation increased from 2003-2018, with the highest number of annual visits occurring in 2018 with 4.1 million (New York Office of Parks, Recreation, and Historic Preservation, n.d.). The number of annual visits to these state parks does not represent the number of unique people who visited them, as it is possible for the same person to visit a park more than once. The data does not differentiate between residents of the study area and visitors to the study area.

Another way to measure the study area's potential economic dependence on a sanctuary is by looking at the number of landmarks and museums that are related to underwater cultural and historical resources and maritime heritage. The region includes several lighthouses and maritime museums (refer to Table 5.2).

Fort Ontario State Historic Park in Oswego is one of the most recognized historic sites in the area and is being considered for inclusion in the National Park System.¹⁹ The Fort Ontario Military Complex dates back to the early 1840s and is built on the ruins of three earlier fortifications from the French and Indian War, Revolutionary War, and War of 1812. This complex also includes the Safe Haven Holocaust Refugee Shelter Museum, which commemorates the 982 European refugees who were sheltered at Fort Ontario in 1944.

4.3.2.2 Recreational Fishing

Recreational fishing is one of the most popular recreational activities in Lake Ontario and the Thousand Islands region. Trout and salmon are the most sought-after fish in Lake Ontario, followed by smallmouth bass, yellow perch, and walleye (New York State Department of Environmental Conservation (NYSDEC, 2019)). Smallmouth bass are the primary targets for recreational fishermen in the New York Thousand Islands fishery, in addition to northern pike, yellow perch, walleye, and muskellunge (NYSDEC, 2019).

In 2008 and 2009, boaters spent an average of 337,000 angler-hours in the U.S. portion of the St. Lawrence River (New York State Department of Environmental Conservation, 2010). Around 80% of fishing effort was focused in the Thousand Island region. About 72% of anglers were New York residents and over 51% of these anglers lived within the study area. In 2009, anglers on the St. Lawrence River caught 1.3 million yellow perch, 97,000 smallmouth bass, 27,000 pan fish, 19,000 largemouth bass, 18,000 northern pike, and 16,000 walleye. NYSDEC compared these results to surveys conducted in the 1980s and found few differences between them, which suggests that the fishery has not changed much in the past 25 years.

In 2018, there were almost 55,000 recreational fishing trips taken in Lake Ontario by approximately 168,000 anglers (NYSDEC, 2019). Approximately 33,000 of the fishing trips in Lake Ontario took place in the eastern half of the lake, representing about 60% of all recreational fishing trips in the lake (NYSDEC, 2019). Charter boats accounted for about 12,000 of the recreational fishing trips, or 21% of all trips (NYSDEC, 2019). In Sodus Bay Harbor alone there are about 50 charter boats, which take around 1,445 trips annually (U.S. Army Corps of Engineers, 2019).

The NYSDEC divides its recreational fisheries data collection into four statistical areas (NYSDEC, 2019). As the two eastern statistical areas align closely with eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River, they can be used as a proxy for how many fish are caught there. The top species caught in Lake Ontario in 2018 were Chinook salmon, brown trout, smallmouth bass, rainbow trout, lake trout, and yellow perch. From 2009 to 2018, Chinook salmon accounted for the most catch with 879,000 caught, followed by yellow perch with 366,000 caught, brown trout with 326,000 caught, rainbow trout with 317,000 caught, and lake trout with 254,000 caught. Total catch for these species has generally declined from 2009 to 2018 (NYSDEC, 2019).

¹⁹ The *Fort Ontario Study Act* (2018) authorizes the National Park Service to conduct a study to assess the feasibility of incorporating Fort Ontario and the Safe Haven Holocaust Refugee Shelter Museum in Oswego County as a unit of the National Park Service.

Fishermen on Lake Ontario tend not to fish on wrecks because their target species do not aggregate reliably around them (recreational charter boat captain, personal communication, Dec. 3, 2020). In the main body of Lake Ontario, many of the wrecks are too deep for recreational fishing gear to interact with them. In shallower depths, such as along the shoreline and in the St. Lawrence River, there is a chance that fishing lines can get entangled in a wreck. However, the tensile strength of the fishing line used for the main target species listed above is often low enough that the line will break if caught on a solid structure instead of pulling and breaking off part of a wreck. Divers have observed abandoned fishing lines on wrecks in the study area (recreational charter boat captain, Dec. 3, 2020). This debris may threaten the integrity of the wreck, pose an entanglement threat to wildlife, and is unsightly.

4.3.2.3 Recreational Scuba Diving

The St. Lawrence River has long been recognized as one of the premier destinations for freshwater shipwreck diving in the United States. Wreck sites, such as *Keystorm* and *A. E. Vickery*, continue to draw visitors due to both their level of preservation and ease of access. While significantly less developed than the St. Lawrence River, recreational diving in eastern Lake Ontario does occur. The most popular wreck to dive in Lake Ontario is *St. Peter* (Figure 4.21).

Scuba divers represent an economic impact of more than \$108 million (1999 dollars) to New York's Great Lakes region (New York Sea Grant, 1999). There are a total of 18 dive shops that are known to dive on shipwrecks in eastern Lake Ontario and the St. Lawrence River. The number of dive shops was determined based upon correspondence with locals with knowledge of dive operations in this region. Four of these dive shops are located in Canada and 14 are in the United States. According to prices posted on dive operator websites, dive charters to Lake Ontario can range between \$30 and \$140.²⁰ Of the 18 dive shops, 15 offer dive courses and dive charters.

²⁰ Prices in Canadian dive shops were converted to U.S. dollars.

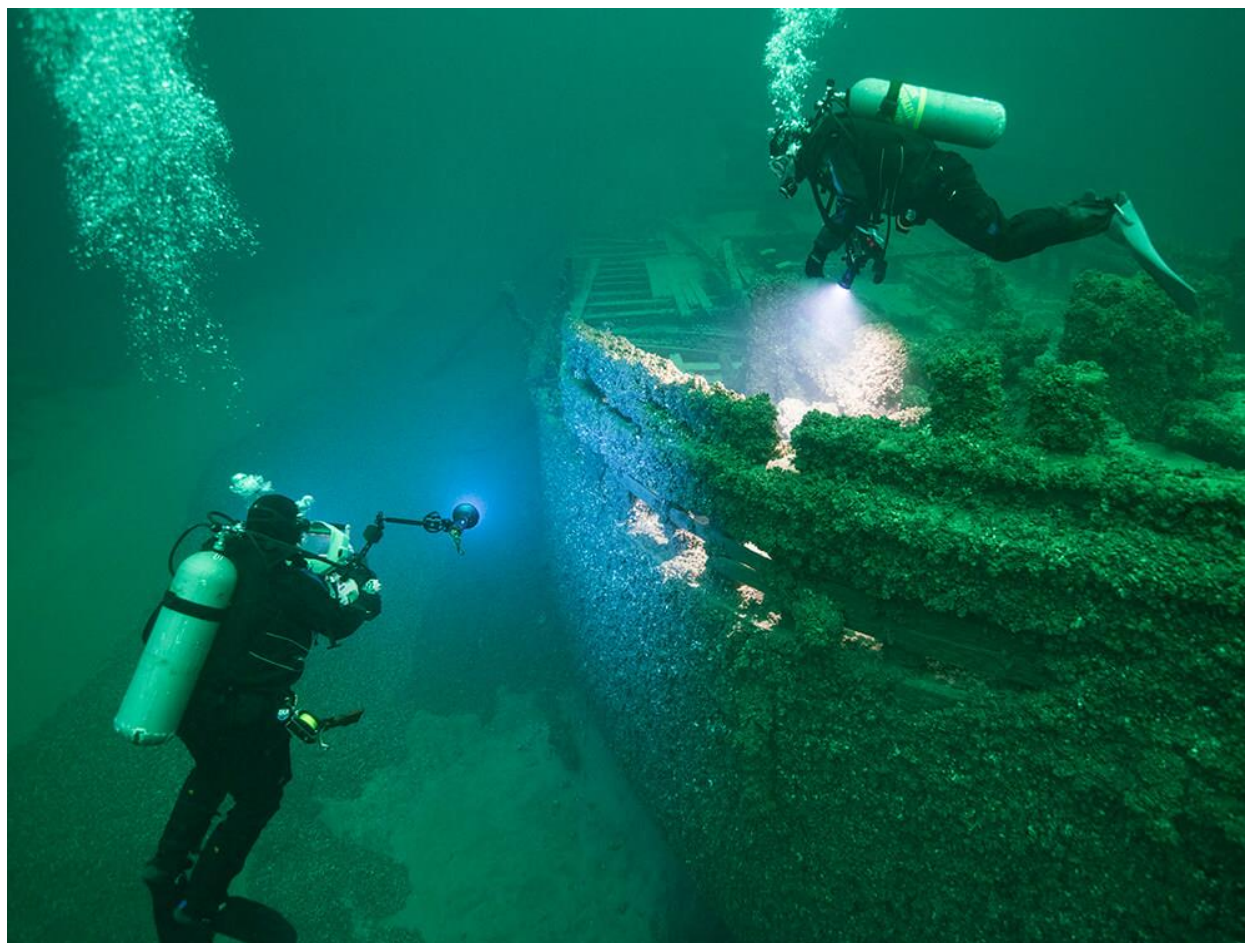


Figure 4.21. NOAA divers take photos of *St. Peter*. Photo: NOAA

4.3.2.4 Recreational Boating

Few studies have been conducted to look at the economic contributions and status of recreational boating in the study area (Figure 4.22). A study conducted using 2003 United States Coast Guard registration data found that nearly one-third of all recreational boats in the country are registered in and around the Great Lakes (U.S. Army Corps of Engineers, 2008). The 2008 study also found that there are roughly 18,000 Great Lakes marina slips in New York, which includes all slips on Lake Erie and Lake Ontario. Of these, 16,423 slips are seasonal slips and 15,273 are occupied. Additionally, there are eight active recreational harbors on Lake Ontario. The U.S. Army Corps of Engineers evaluated Sodus Bay Harbor for its economic benefits generated from recreational boating and fishing activities in 2019 (U.S. Army Corps of Engineers, 2019). The study found that from six marinas (not an inclusive list) located in the harbor, roughly 27,000 boat trips are taken annually in the harbor and that over 21,000 boat owners spend leisure time at marina facilities enjoying the waterfront and social events. The study also found that boat trip spending and annual craft spending from marinas surveyed at Great Sodus Bay Harbor generated \$9.5 million in revenue, supported 103 full-time equivalent jobs, and generated \$11.8 million in output in the local study area (U.S. Army Corps of Engineers, 2019).



Figure 4.22. Sailboats sail on the St. Lawrence River. Photo: 1000 Islands International Tourism Council

4.3.3 Commercial Activities

4.3.3.1 Commercial Fishing

Commercial fishing in eastern Lake Ontario is very limited; it is concentrated in the embayments and nearshore open waters of the eastern basin. Commercial fishing gear includes gill nets, trap nets, and fyke nets; however, only gill nets were actively fished in 2018.

Commercial fishermen generally target yellow perch (*Perca flavescens*); however, harvest of cisco (*Coregonus artedii*) was also reported in 2018 (NYSDEC, 2019). Data from NYSDEC shows that in 2018 there were two active licenses for fishermen in eastern Lake Ontario. Yellow perch accounted for the highest amount of commercial catch with 38,987 pounds caught in 2018 for a value of \$71,134 (NYSDEC, 2019).

4.3.3.2 Shipping

The Great Lakes-St. Lawrence River waterway, which runs from the mouth of the St. Lawrence River in the Atlantic Ocean to the western side of Lake Superior, connects more than 110 commercial ports in Canada and the United States. The waterway is the longest inland deep-draft navigation system in the world (Figure 4.23).

Alternative 1's boundary would overlap with a portion of the Great Lakes-St. Lawrence River waterway in the waters of eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River. Administration of the Great Lakes-St. Lawrence Seaway System is shared by the U.S. Department of Transportation's St. Lawrence Seaway Development Corporation and the Canadian St. Lawrence Seaway Management Corporation.

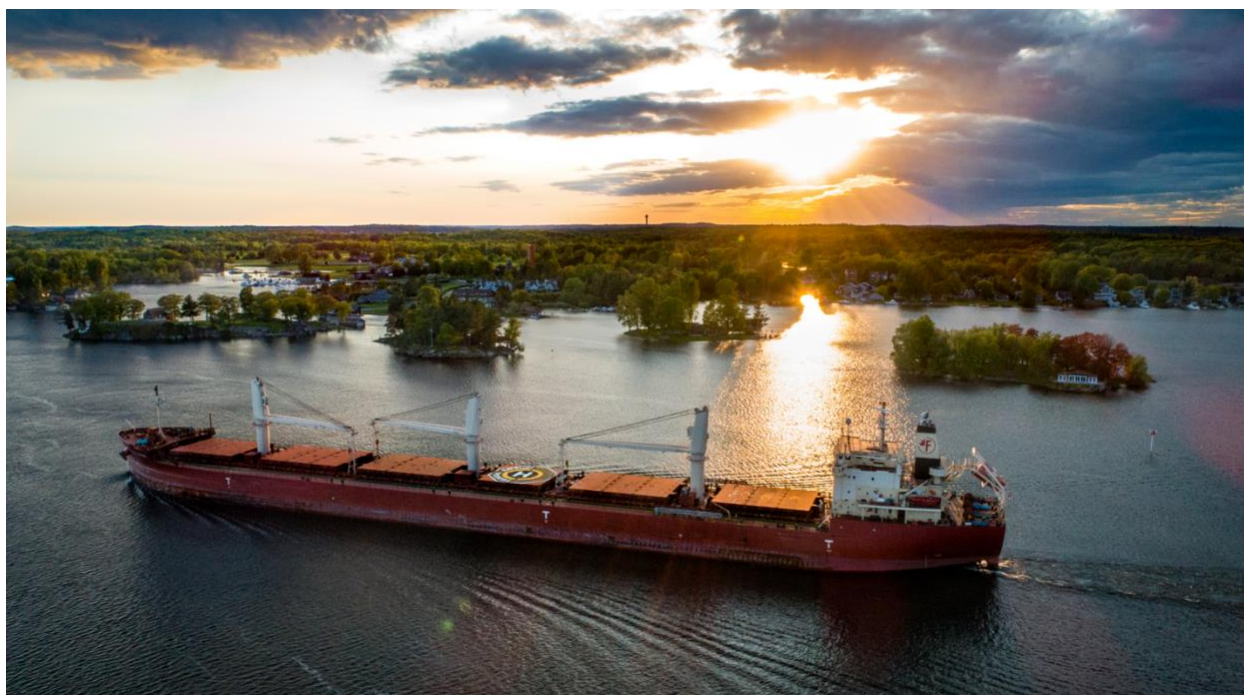


Figure 4.23. A merchant freighter moves through the St. Lawrence River. Photo: Matt McIntosh/NOAA

Commercial shipping on the Great Lakes carries the raw materials that drive the nation's economy. The Economic Impacts of Maritime Shipping in the Great Lakes-St. Lawrence Region Report (Martin and Associates, 2018) stated that:

In 2017, a total of 143.5 million metric tons (158.3 million short tons) of cargo valued at US\$15.2 billion (Cdn\$19.8 billion) moved through the Great Lakes-Seaway system. A majority of the domestic cargo moving on Canadian and U.S. flag vessels remains in the Great Lakes-Seaway system, creating economic impacts at the loading port, as well as the port of discharge. With this accounted for, the actual tons handled at the ports on the Great Lakes-Seaway system is 284.8 million metric tons (314.0 million short tons).

The report also indicates that 2017 marine cargo and vessel activity in the Great Lakes-Seaway system generated a total of US\$35.0 billion (Cdn\$45.4 billion) in economic activity in the United States and Canada, and that this commerce supported 237,868 U.S. and Canadian jobs, including 78,400 direct jobs (Martin and Associates, 2018).

The Port of Oswego, New York, is the first U.S. port of call and deepwater port on the Great Lakes from the St. Lawrence Seaway. The Port of Oswego receives vessel traffic year-round, with deep draft vessels arriving from the north shore of Lake Ontario even when the St. Lawrence Seaway is closed to navigation. This port supported 209 jobs and generated business revenue of \$19 million in 2017 (Martin and Associates, 2018). It should be noted that both alternatives 1 and 2 exclude the Port of Oswego and the federally authorized areas (channel) leading to the port. Federally authorized areas adjacent to the ports and harbors are periodically dredged by the U.S. Army Corps of Engineers. As the lanes are excluded from the boundaries, dredging activities to support commercial shipping are not discussed further here.

4.3.3.3 Energy Generation and Transmission

The Energy Policy Act of 2005 (PL 109-58, 386) instituted a permanent ban on oil and gas development in the Great Lakes. Specifically, the provision enacts a permanent ban on the issuance of federal or state permits for new directional, slant, or offshore drilling in or under the Great Lakes. Therefore, there are no current or planned oil and gas development projects in the area.

NOAA is not aware of any current or planned offshore wind energy projects for the area. In 2022, New York State Energy Research and Development Authority (NYSERDA) published a study assessing the feasibility of developing offshore wind energy in the Great Lakes adjacent to New York state. The study was commissioned as part of the state's effort to meet the 70% renewable energy by 2030 requirements of New York's Climate Leadership and Community Protection Act. The Great Lakes Wind Feasibility Study focused on Lake Erie and Lake Ontario and consisted of data and information synthesis, technical analysis, and a policy options analysis to explore viable paths forward for wind energy in the Great Lakes. The study considered existing and emerging technologies for fixed and floating turbines, new technology development timelines, geospatial conditions, resource assessment, regulatory processes, permitting requirements and risks, potential conflicts, costs and economic opportunities, electrical infrastructure, and overall cost-reduction pathways. The study found that developing wind energy in Lakes Erie and Ontario is technically feasible but projects are currently not a cost effective addition to the state of New York's renewable energy portfolio. In future years, a comprehensive planning and siting exercise would be needed to identify potential areas for development (NYSERDA, 2022).

There are several submarine cables that connect the numerous islands in eastern Lake Ontario and the St. Lawrence River to shore (U.S. Bureau of Ocean Energy Management & National Oceanic and Atmospheric Administration, n.d.). Existing submarine cables are routinely maintained and upgraded, and occasionally new cables are installed.

The number of new fiber optic cables proposed state-wide has increased substantially in the past few years, although none have been proposed in eastern Lake Ontario or the Thousand Islands region.

4.3.4 Military Activities

4.3.4.1 U.S. Army

Fort Drum is a U.S. Army military installation in Jefferson County, New York. Fort Drum is home to the 10th Mountain Division (Light Infantry), and about 15,000 military service members and about 3,700 civilian personnel work there. Fort Drum provides full-spectrum training and base operations support to all of the service branches, 11 states, and parts of Canada. Annually, Fort Drum offers training and base operations support to more than 26,500 Reserve and National Guard members as well as personnel from other federal, state, and local agencies (U.S. Army, n.d.; U.S. Army Garrison Fort Drum, 2011).

In terms of activities that the Army conducts on Lake Ontario, there are Active, Reserve and National Guard units that are trained and qualified to respond and execute water bucket

operations in the event of a state or national emergency. Using helicopters, some of these training exercises could take place over Lake Ontario with coordination and cooperation of federal and state agencies and local municipalities. In addition to water bucket training, U.S. soldiers from Fort Drum have conducted training exercises jumping from a helicopter into a bay off of Lake Ontario in order to train soldiers on waterborne operations/combat water insertions, and conduct engineer beachhead reconnaissance activities. In 2018, soldiers conducted this exercise in Black River Bay at Sackets Harbor.

4.3.4.2 U.S. Coast Guard

U.S. Coast Guard District 9 is responsible for all Coast Guard operations throughout the Great Lakes, the St. Lawrence Seaway, and along 6,700 miles of shoreline and 1,500 miles of the international border with Canada (U.S. Coast Guard, n.d.). The U.S. Coast Guard District 9, Sector Buffalo, operates in eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River. The two main Coast Guard stations in this area are Station Oswego and Station Alexandria Bay. Station Sodus Point and Station Sackets Harbor are seasonal sub-stations.

The Ninth District's primary missions in the Great Lakes are search and rescue, maritime safety and security, environmental protection, maritime law enforcement, aids to navigation, and icebreaking. The U.S. Coast Guard would also assist NOAA with surveillance efforts and actions related to enforcing regulations in the proposed sanctuary (Figure 4.24).



Figure 4.24. U.S. Coast Guard 45-foot response boat docks in Oswego, New York. Photo: U.S. Coast Guard

4.2.4.3 New York Air National Guard

There is a 925-square-mile military exercise area in the southern half of Lake Ontario called Restricted Area 5203 (R-5203) (see NOAA nautical chart 14800). The coordinates of the rectangular area are approximately 43°37'N, 76°45'W; 43°24'N, 76°45'W; 43°24'N, 78°00'W; and 43°37'N, 78°00'W (Figure 4.25). The southeast corner is roughly 4.5 miles northwest of the mouth of Little Sodus Bay and continues for approximately 62 miles, approaching the county boundary between Orleans and Monroe counties. The southwest corner of the area comes within 2 miles of the shoreline at its southwest corner and is roughly 11 miles from the shoreline at Rochester. The training area is approximately 13 miles wide from north to south and comes within one mile of the international border between the U.S. and Canada. Under alternatives 1 and 2, the proposed sanctuary boundaries would overlap with approximately 470 square miles of the exercise area.

This military exercise area is generally used for aircraft training by the New York Air National Guard. The primary user is the 174th Operations Group, which operates from Hancock Airfield in Syracuse, New York. The 174th Attack Wing (ATKW) primarily performs the Remotely Piloted Aircraft mission.

To meet increasing training requirements, the 174th ATKW is planning to perform live-fire exercises in R5203 over Lake Ontario. The National Guard Bureau has begun the process of reactivating R-5203 as a live-fire range to allow this activity, along with other potential live-fire ranges in the other Great Lakes. However, this process has been put onto an indefinite hold due to obstacles regarding the limited size of R-5203. There is no estimated date for resolving these obstacles and completing the certification. Once approved for this activity, at standard static locations, inert forward firing and glide munitions will be launched by aircraft into the water. The munitions will impact the surface and then sink into Lake Ontario within the boundaries of R-5203. The intent is to choose these locations based on advice of all concerned parties. The processes and procedures in place for the currently active live-fire ranges, such as Restricted Area 4207, over Lake Huron, will be duplicated for R-5203. The National Guard Bureau estimates two to four exercises per year and 10 to 20 munitions per exercise, depending on training requirements.

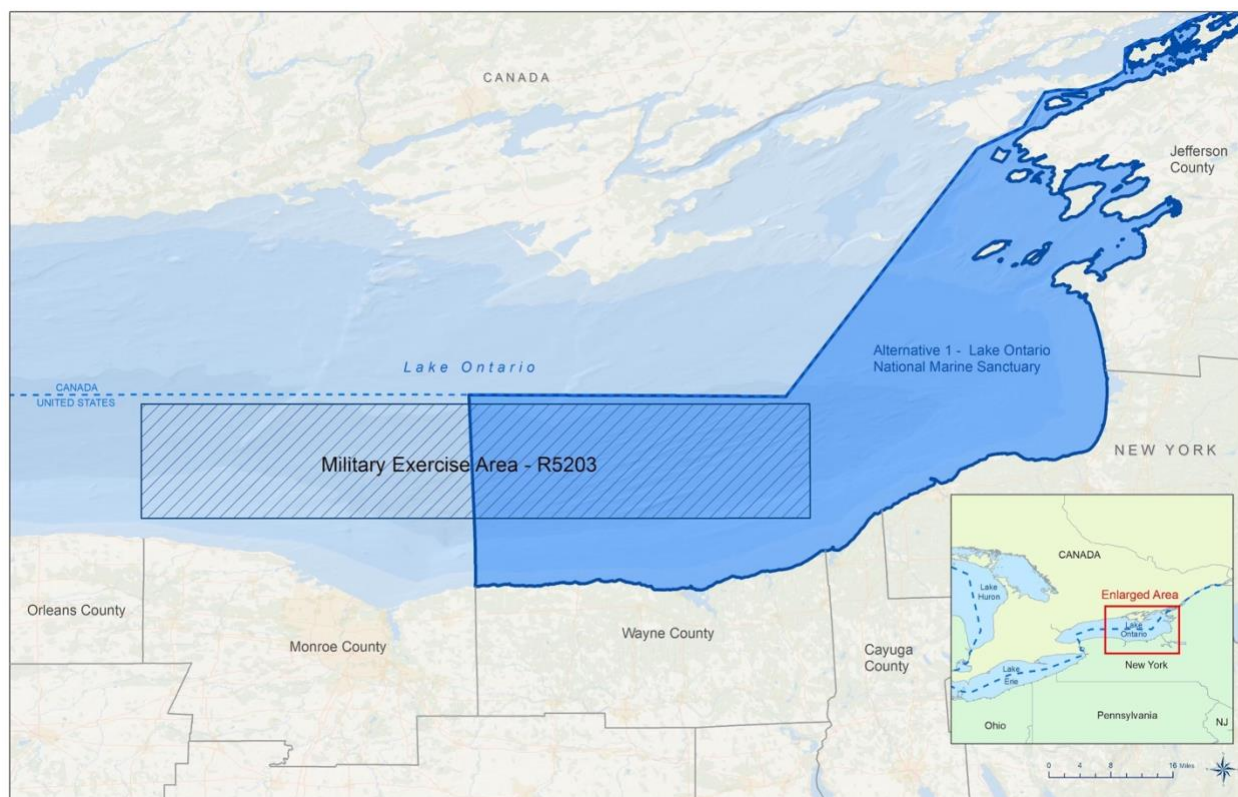


Figure 4.25. NOAA's boundary alternatives (Alternative 1 shown) overlap with the R-5203 military training area (hatched black) in Lake Ontario. Image: NOAA

4.3.5 Socioeconomics

NOAA analyzed local economic data to determine how dependent the local economy may be on sanctuary resources and how designating a sanctuary may impact the local economy. NOAA analyzed population metrics to indicate the local pressures on resources and demographic data to predict sanctuary visitation, as well as to inform future management measures. Population size, population growth rate, and population density can indicate the levels of current and future human use of, and pressure on, natural and cultural resources in the study area. NOAA also uses population data to decide where to locate visitor centers, exhibits, and signage based upon desired reach, existing infrastructure, and resources. NOAA prepared a detailed socioeconomic profile to characterize recent demographic and economic conditions and to determine the baseline statistics to be used in the impact analysis of the alternatives (see [NOAA's Proposed Lake Ontario National Marine Sanctuary Study Area Profile](#)²¹).

4.3.5.1 Study Area for Socioeconomic Data

NOAA examined the socioeconomic resources and economic effects in a study area that includes both primary and secondary counties in eastern Lake Ontario and the Thousand Islands region. "Primary" denotes counties that lie adjacent to the boundaries of Alternatives 1 and 2. "Secondary" generally denotes counties that have more than 10% of their workforce commuting

²¹ <https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/docs/20210520-lake-ontario-study.pdf>

to or from a primary county. The primary counties in this analysis are Jefferson, Oswego, Wayne, and Cayuga, and the secondary counties are Onondaga, Ontario, and St. Lawrence counties (Figure 4.20). While St. Lawrence County would ordinarily qualify as a primary county due to it bordering the boundary in Alternative 1, NOAA categorized it as a secondary county in this analysis because the sanctuary boundary would only overlap with one mile of the county. Monroe County, while having a large population, does not meet the definition of secondary county, as less than 10% of its workforce commutes to a primary county.

4.3.5.2 Population and Demographic Trends in the Study Area

The study area had a population of over 1.1 million in 2018, which is approximately 5.8% of New York's total population. Onondaga County has the largest population in the study area, with a population of over 464,000 people. The least populated county in the study area is Lewis County, with a population of approximately 27,000 people (Table 4.4). The total population in the study area declined from 2010–2018. There is some variation in population density among counties in the study area. Onondaga County is the most densely populated, with 596.41 people per square mile (Table 4.4). Lewis County is the least densely populated, with 20.96 people per square mile. The total population density in the study area is lower than in New York state but higher than in the United States.

Table 4.4. Population statistics in the study area. Image: NOAA; Source: [U.S. Census Bureau](#) and [U.S. Bureau of Labor Statistics](#)

New York County	2018 Population	Population Change (%) 2010–2018	Population Density ¹ 2018
Cayuga	77,868	-3.20%	112.59
Jefferson	114,448	-0.50%	90.22
Oswego	119,104	-2.50%	125.16
Wayne	90,856	-3.00%	150.47
Lewis	26,719	-1.10%	20.96
Onondaga	464,242	0.10%	596.41
Ontario	109,472	3.00%	169.97
St. Lawrence	109,558	-2.00%	40.87
Seneca	34,612	-2.00%	106.92
Study Area Total	1,146,879	-0.70%	124.43
New York	19,618,453	2.00%	416.29
USA	322,903,030	6.20%	91.42

¹ Number of people per square mile of land area.

4.3.5.3 Gender, Race, Ethnicity, and Age

Gender, race, ethnicity, and age can indicate how visitors may use the sanctuary. NOAA also uses this information to increase accessibility to sanctuaries and to direct its education and outreach efforts to reach a wide variety of audiences.

Gender

The gender distribution in the study area has remained relatively constant from 2010-2018, with the population in the study area being about 50% males and 50% females.

Race and Ethnicity

84.7% of the population self-identified as “white;” 6.2% as “Black;” 4.3% as “Hispanic;” 0.4% as “American Indian;” 2.1% as “Asian;” 0% as “Pacific Islander;” and 0.1% as “other.” In 2018, the proportion of the study area population self-identified as “white” was higher than that of the United States and New York. The percentage of people self-identified as “Black” was lower in the study area than that in the United States and the state of New York. The study area had a lower percentage of those who identified as “Hispanic” and “Asian” than both New York and the United States in 2018 (U.S. Census Bureau, n.d.; Figure 4.26). Minority populations are not predominant in the study area.

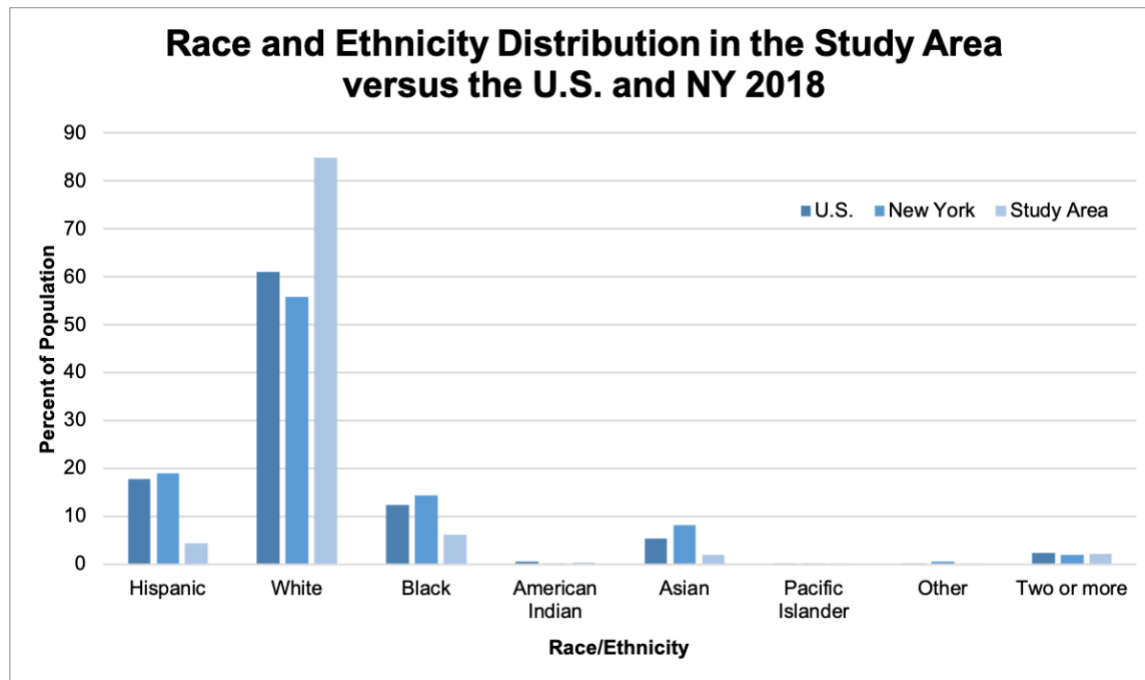


Figure 4.26. Race and ethnicity in the study area versus the U.S. and New York, 2018. Image: NOAA; Source: [U.S. Census Bureau](#) (2018)

Age Distribution

Approximately 51% of the population is between the ages of 25 and 65. The age distribution in the study area is similar to the distribution in New York state and the United States (U.S. Census Bureau, n.d.; Figure 4.27).

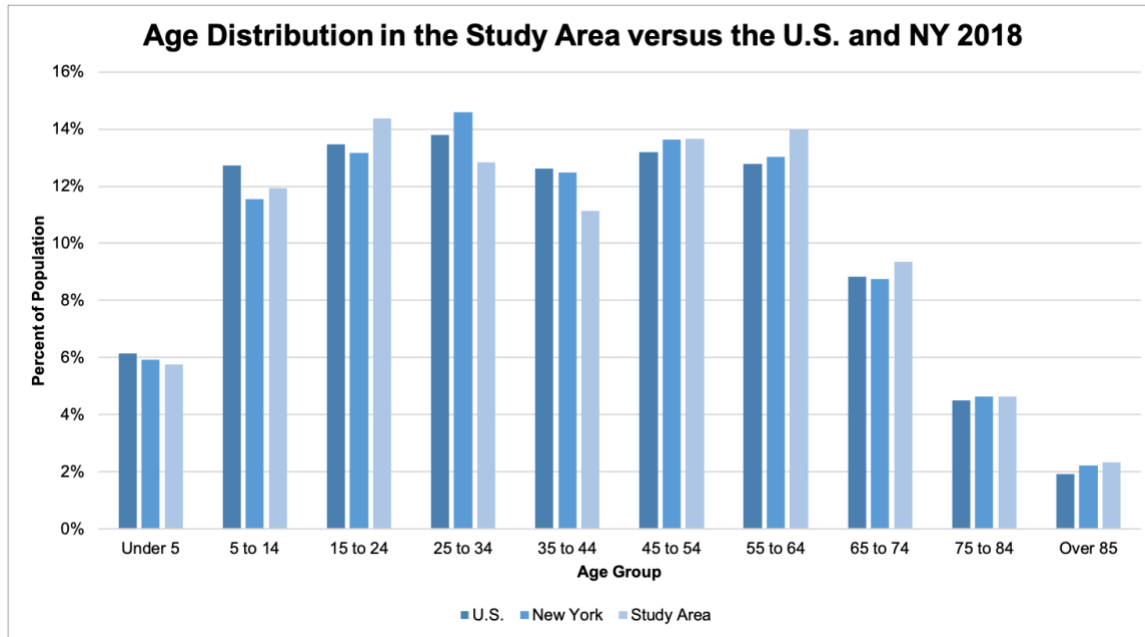


Figure 4.27. Age distributions in the study area versus the U.S. and New York. 2018. Image: NOAA; Source: [U.S. Census Bureau](#) (2018)

4.3.5.3 Income, Labor Force, and Employment in the Study Area

This section describes sources of income and the status of the labor force in the study area. The labor force, total employment, and their respective growth rates are indicators of the health of the local economy and opportunities for employment. NOAA also analyzes economic measures related to proprietors (small business owners), including proprietors' income, proprietors' employment, and the proportion of the study area's income and employment accounted for by proprietors. This can be an indicator of the importance of small businesses in their communities, which are often connected to resource use in national marine sanctuaries (e.g., recreation and tourism-related businesses, such as dive shops or recreational fishing charters).

Income

Real per capita income measures the average income earned per person in a given area in a specified year. Per capita income is an indicator for the health and economic status of a community. Per capita income in the study area in 2018 was \$47,359 compared to the state's per capita income of \$68,688 and the U.S. per capita income of \$54,446 (U.S. Bureau of Economic Analysis, n.d.). From 2010 to 2018 per capita income in the study area rose, which is a similar trend to both New York state and the United States; however, it has been consistently lower than the United States and New York (U.S. Bureau of Economic Analysis, n.d.). The majority of the population is above the poverty line.

Labor Force and Employment

In 2019, there were over 523,000 persons in the study area labor force, which is approximately 5.5% of the New York state labor force (U.S. Bureau of Labor Statistics, n.d.). From 2010-2018 the size of the labor force in the study area and in New York declined (U.S. Bureau of Labor Statistics, n.d.).

The unemployment rate in the study area was 4.4% in 2019 (U.S. Bureau of Labor Statistics, n.d.; Table 4.5). The unemployment rate has fallen in the study area since 2011, but has been higher than in New York state and the U.S. during that period (U.S. Bureau of Labor Statistics, n.d.).

Table 4.5. Per capita income, percent of the population in poverty, and unemployment rate for the counties in the study area, the state of New York, and the United States in 2018. Image: NOAA; Source: [U.S. Census Bureau](#), Small Area Income and Poverty Estimates; [U.S. Bureau of Economic Analysis](#); [U.S. Bureau of Labor Statistics](#).

New York Counties	Per Capita Income (2018)	Percent in Poverty (2018)	Unemployment Rate (2019)
Cayuga	\$42,231	13.7%	4.3%
Jefferson	\$46,924	16.7%	5.6%
Oswego	\$40,538	8.5%	5.4%
Wayne	\$46,048	12.6%	4.0%
Lewis	\$43,971	12.3%	5.5%
Onondaga	\$52,886	12.2%	3.9%
Ontario	\$53,498	13.7%	3.9%
St. Lawrence	\$37,940	16.1%	5.5%
Seneca	\$38,593	15.1%	3.8%
Study Area Total	\$47,359	13.0%	4.4%
New York State	\$68,668	13.7%	4.0%
U.S.	\$54,446	13.1%	3.6%

In 2018, the highest percentages of people in the study area were employed by the government and government enterprises (19.01%) and the healthcare and retail trade sector (12.20%) (U.S. Bureau of Economic Analysis, n.d.; Figure 4.28).

As mentioned previously, NOAA analyzes economic measures related to proprietors²² because these metrics are good indicators of the importance of small businesses in their communities. Most marine recreation businesses are small businesses and would be classified as such. In 2018, proprietors in the study area employed 121,000 people, which made up 24.2% of total employment in the study area. Proprietors earned almost \$3.6 billion in 2018, which is 9.7% of income by place of work in the study area.

²² Current-production income of sole proprietorships, partnerships, and tax-exempt cooperatives. Excludes [dividends](#), monetary interest received by non-financial business, and rental income received by [persons](#) not primarily engaged in the real estate business. BEA, 2020. https://www.bea.gov/help/glossary?title_1=All&title=proprietor

The study area had a consistently lower percentage of both employment and income from proprietors from 2010–2018 than New York state as a whole. In the study area, proprietors' employment as a percentage of total employment slowly rose from 2010–2018 (U.S. Bureau of Economic Analysis, n.d.). This means that over the study period, the number of people employed by small businesses increased relative to other sources of employment (larger businesses and government, for example).

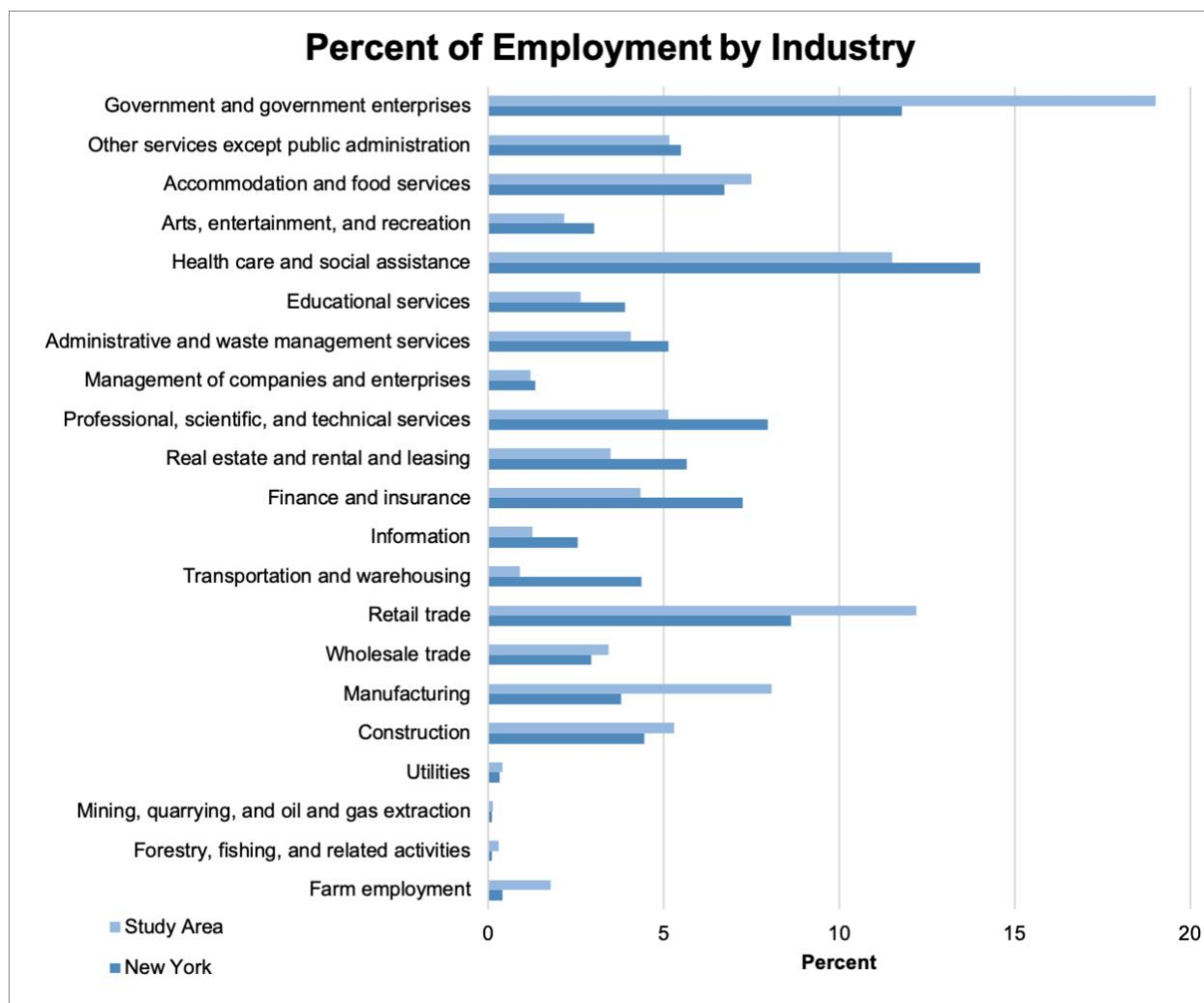


Figure 4.28. Percent of employment by industry for the study area versus New York state in 2018. Image: NOAA; Source: [U.S. Bureau of Economic Analysis](https://www.bls.gov/)

New York Potential Environmental Justice Areas

The New York State Department of Environmental Conservation has established a [policy on Environmental Justice](#) (EJ)²³ and permitting, stating “Environmental Justice is the fair and meaningful treatment of all people, regardless of race, income, national origin or color, with respect to the development, implementation, and enforcement of environmental laws, regulations and policies. Environmental Justice allows for disproportionately impacted residents to access the tools to address environmental concerns across all of DEC's operations.”

²³ <https://www.dec.ny.gov/public/333.html>

The Office of Environmental Justice (OEJ) works to address environmental issues and concerns that affect primarily low income and minority communities through grant opportunities, enforcement of environmental laws and regulations, consultation, guidance, and enhanced public participation.

In the DEC Commissioner Policy 29 on Environmental Justice and Permitting (CP-29), Potential EJ Areas are U.S. Census block groups of 250 to 500 households each that, in the U.S. Census, had populations that met or exceeded at least one of the following statistical thresholds:

1. At least 52.42% of the population in an urban area reported themselves to be members of minority groups; or
2. At least 26.28% of the population in a rural area reported themselves to be members of minority groups; or
3. At least 22.82% of the population in an urban or rural area had household incomes below the federal poverty level.

[NYSDEC maps](#) indicate areas in the study area that are considered to be EJ areas. Each county in the study area has some areas identified.²⁴

4.4 Physical Environment

This section describes the physical environment including the geology, climate, and water quality within eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River. The natural resources of this area contribute significantly to industry, shipping, fishing, and recreation, as well as to a rich and diverse ecosystem.

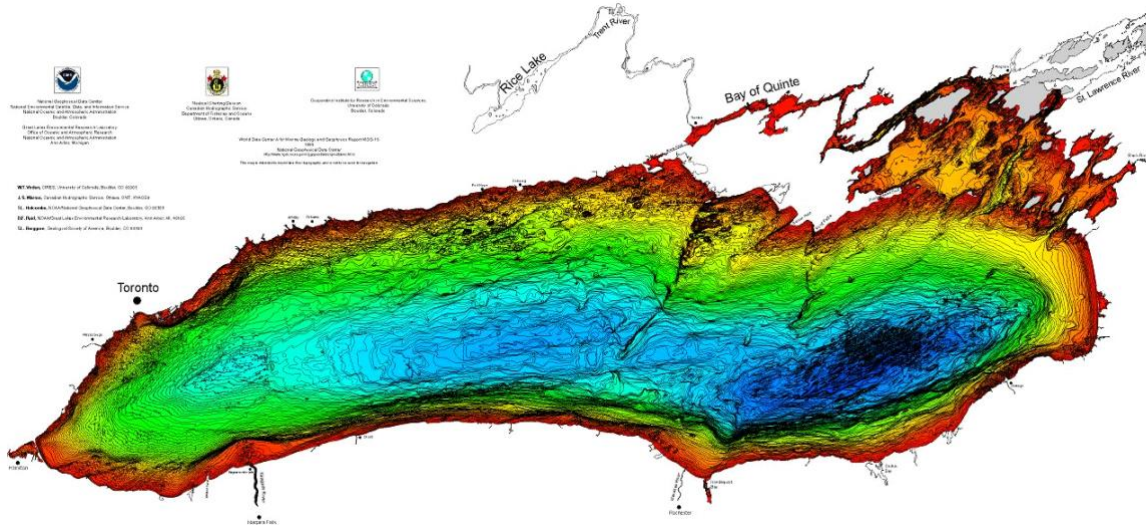
4.4.1 Physical Resources within Lake Ontario

Lake Ontario is the 12th largest freshwater lake in the world, by area and by volume. It is the smallest of the Laurentian Great Lakes of North America but is the second deepest with an average depth of 283 feet; only Lake Superior is deeper (Waples et al., 2008).

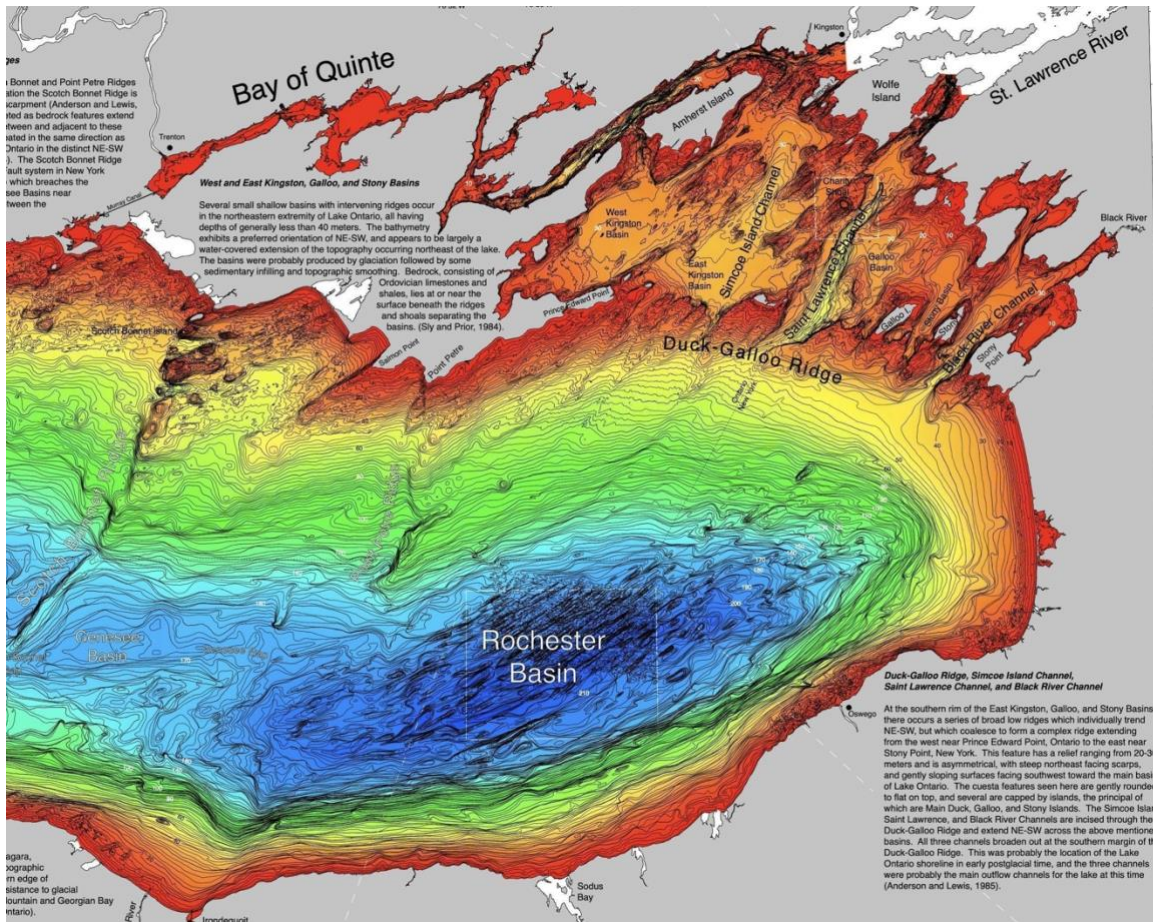
4.4.1.1 Geology (Lake Ontario)

The character of the lakebed differs by how the last glacial period eroded the bedrock. The movement of glaciers eroded the shales and redbeds in the north more easily than the limestones in the south, leaving asymmetrical slopes to the basin sides. As can be seen in the bathymetry map (Figure 4.29A) produced by NOAA's National Centers for Environmental Information, the Mississauga, Genesee, and Rochester are the basins partially or wholly within the area (NOAA National Centers for Environmental Information, n.d.). The Rochester Basin in the eastern side of the lake holds the deepest point of the lake, at greater than 820.2 feet (NOAA National Centers for Environmental Information, n.d.). These three basins are deeper near the southern shore, with a more gradual slope to the northern shore. The most extreme slope is in the Rochester Basin offshore of Oswego, New York, where the depth drops to 656 feet within 2.5 miles from shore.

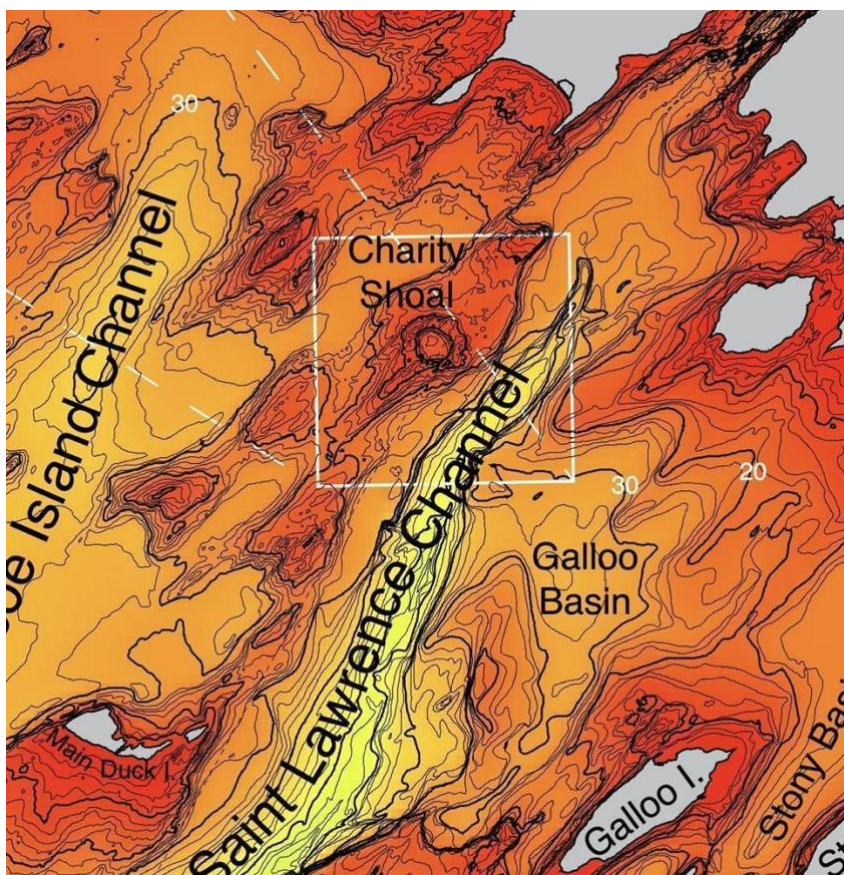
²⁴ <https://www.dec.ny.gov/public/911.html>



A.



B.



C. Figure 4.29 A–C. Bathymetry of Lake Ontario. (A.) The bathymetry of Lake Ontario. (B.) A close up of the bathymetry of the eastern half of Lake Ontario. (C.) A close up of the bathymetry of the Charity Shoal crater in northeastern Lake Ontario. Images: [NOAA National Centers for Environmental Information](#)

Ridges running from the northeast to southwest that may have been formed by glacial processes, break up much of the lake bottom within the proposed sanctuary area. These ridges have a relief of 65 feet (20 meters) and spacing of 820–3,281 feet and also rise above the water surface to form the Galloo and Stoney Islands in the east of the lake. Due to wave and current disturbance and a history of glacial erosion, sediments are not very deep near the lake shoreline, and bedrock exposures are common (NOAA National Centers for Environmental Information, n.d.). The sediments in the depths of the basins are mostly muds, with more clays, sands, and hard bedrock nearer to shore (Great Lakes Aquatic Habitat Framework, 2012).

Another interesting feature of the northeastern lakebed is the Charity Shoal crater (Figure 4.29C). This formation straddles the international border with Canada. The center of this depression is 65.6 feet deep with a 3,937 to 4,921-foot diameter rim, which rises to less than 16.4 feet below the water surface (Holcombe et al., 2013). In 1877 the shoal was marked for navigational safety by the Charity Shoal Light constructed on the U.S. side (Figure 4.30). Researchers have more recently suggested that the crater is the possible result of a meteorite impact more than 540 million years ago with an original crater depth of more than 1,968.5 feet, which filled in with sediments over time (Suttak, 2013).



Figure 4.30. East Charity Shoal Light. Image: U.S. Coast Guard Historian's Office, 2019

The Canadian shoreline on the north shore of Lake Ontario is more urbanized and developed than the south shore and includes the urban areas of Hamilton and Toronto (Waples et al., 2008). Oswego and Rochester are the largest urban areas on the south side of the lake in New York state. The southern and eastern shorelines of the lake are subject to strong winds and wind-driven waves, which have piled eroded sands into dunes. NYSDEC identified an area in this region as the Eastern Lake Ontario Barrier Beach and Wetland Complex, a 17-mile long, 5,800-acre area made up of multiple barrier beaches, embayments, dunes, and wetlands. It contains the world's largest collection of freshwater sand dunes, along with many wetlands and prairies and provides important habitat to a great diversity of life (NYSDEC, 2007).

4.4.1.2 Climate (Lake Ontario)

As mentioned above, the southern and eastern shorelines of the lake are subject to strong winds and wind-driven waves, which erode the shoreline. These westerly winds draw moisture from the lake surface onto the southeast shore causing lake-effect precipitation on the New York shore and areas upland.

The timing of winter ice formation on the lake surface can affect the amount of lake-effect precipitation, as early season ice blocks the lake surface from winds and reduces moisture available for precipitation onto the land (Di Liberto, 2017).

Another important dynamic in the lake system is seasonal vertical water mixing. During warm months, less dense warm water rises to the surface, and denser cold-water sinks. In winter, colder air cools the surface water, which then becomes more dense and sinks. This vertical movement continues until the water cools to 39.16°F. Freshwater is the most dense at this

temperature, therefore the bottom of the lake never gets colder than this. Water colder than 39.16°F (including ice) is less dense and stays at the surface. This allows organisms to survive the winter in liquid water at the lake bottom and also cycles water-soluble nutrients through the water column as this process repeats at the start of the next spring.

Lake Levels

Lake level variations affect a wide variety of uses and resources, such as coastal property, commercial shipping, hydropower production, ecological structure and function, recreational activities, and aesthetic enjoyment of the lake, in complex and varied ways. For example, certain high-water levels can have beneficial outcomes like increasing hydropower production, improving ecological functions, and allowing deeper drafts for shipping, while also increasing the risk of flooding for vulnerable properties and limiting access to recreation activities and lake-based businesses.

Weather patterns within the Lake Ontario watershed and across the entire Great Lakes system are a strong driver of lake levels. Warm water temperatures, dry air, and strong winds can increase evaporation and lower lake levels, while higher precipitation levels and overwinter ice cover help to maintain or increase lake levels. While lake levels demonstrate multiyear, periodic cycles of relatively high and low water, changes in weather can also lead to variations in lake levels on a short-term and seasonal basis. The predominance of northerly and westerly wind-driven wave action can exacerbate high water levels and lead to a relatively greater effect on Lake Ontario's southern and eastern shores than may be experienced on the northern shore.

Because Lake Ontario is at the downstream end of the Great Lakes Basin, water levels in the Lake are predominantly affected by the water supply in the upper Great Lakes and resultant inflows from Lake Erie. Lake Ontario outflow rates are regulated at the Moses-Saunders dam near Massena, New York, and Cornwall, Ontario, according to international agreement. NOAA does not have a role in managing lake levels in Lake Ontario. This provides some ability to address impacts from extreme high and low water levels by increasing or decreasing outflow rates. However, the ability to adjust for seasonal variations requires significant releases over extended time periods to achieve an appreciable effect on water levels; this is constrained by multiple factors including the water supply upstream in the rest of the basin, weather patterns within the Lake Ontario watershed, and conditions downstream of the dam in the St. Lawrence River (Figure 4.31).

The shipping industry is significantly affected by lake water level, which may affect vessel draft and load capacity, port access, and transit through locks. Lake levels are influenced by many factors, including precipitation, snowmelt runoff, drought, evaporation rates, and withdrawals for urban and agricultural uses. Lake levels may also affect nearshore shipwrecks, coastal erosion, hydropower production, recreation activities, stormwater removal, flooding, and property damage. Management controls through actions of the Moses-Saunders dam on the St. Lawrence River at Cornwall, Ontario, may well be able to maintain current levels (Gronewold & R.B., 2019).

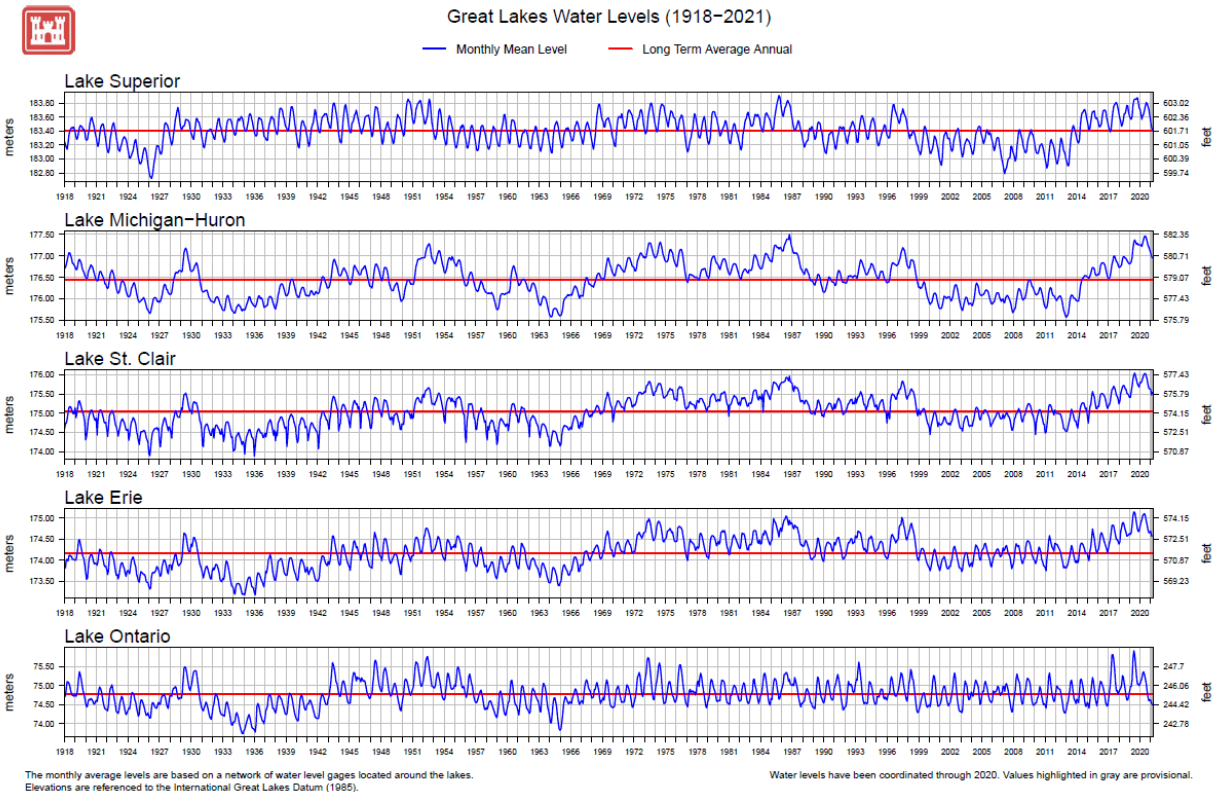


Figure 4.31. Great Lakes water levels. Image: U.S. Army Corps of Engineers

Climate Change Effects in the Great Lakes

Average air temperatures in the Great Lakes region are rising. Since 1951, annual average temperatures have increased by 2.3°F (1.3°C) across the 8 U.S. Great Lakes states (i.e., Illinois, Indiana, Michigan, Minnesota, Ohio, New York, Pennsylvania, and Wisconsin). Model projections show future temperatures will continue to rise by 6 to 11°F (3.3 to 6.1°C) throughout the region by 2100. Winter temperatures have been rising faster than other seasons, with many areas experiencing twice the annual rate of warming. Ice cover on the Great Lakes has declined since the start of the record in 1973 and will likely continue to decrease in the future. Reduced ice cover results in more winter lake-effect precipitation and increased winter wave activity (GLISA, n.d.).

The water temperatures in the Great Lakes have been rising faster than nearby air temperatures. Lake Ontario's summer lake temperatures rose by 2.9°F (1.6°C) between 1968 and 2002 (Dobiesz and Lester, 2009). As water temperatures rise, scientists predict that lake stratification and the frequency of hypoxic conditions will increase and reduce overall biomass productivity in lakes and waterways (GLISA, n.d.).

Climate change is expected to exacerbate a range of risks to the Great Lakes, including changes in the range and distribution of some species, increases in invasive species and harmful blooms of algae, and declines in beach health. Animal species may need to migrate north to adapt to rising temperatures, and cold-water fish populations are predicted to decline as warm-water fish populations become more abundant. Researchers predict that increased evaporation rates will

decrease the total wetland area in the region during periods of low water levels, which will create additional stresses on species (GLISA, n.d.).

Extreme rainfall events in the Great Lakes region have increased over the last century, and these trends are expected to continue. Combined with land cover changes, increased precipitation has and likely will continue to lead to flooding, erosion, declining water quality, and negative impacts on transportation, agriculture, human health, and infrastructure (GLISA, n.d.).

Water levels in the Great Lakes are also affected by climate variability and climate change. There is no current scientific consensus on future long-term trends of water levels in the Great Lakes, but seasonal, annual, and multi-year variability in lake levels is expected to remain large (Lofgren et al., 2011).

4.4.1.3 Water Quality (Lake Ontario)

The waters of Lake Ontario support both human activities and health and ecological systems necessary for fish and other wildlife. The water provides the opportunity for human recreation activities, such as boating, fishing, and swimming, as well as water-born transportation, trade, and commerce. As noted by Environment and Climate Change Canada (ECCC) and the U.S. Environmental Protection Agency (EPA) in their joint Lake Ontario Lakewide Action and Management Plan (LAMP), the lake also provides drinking water for millions of people in the U.S. and Canada (Environment and Climate Change Canada and the U.S. Environmental Protection Agency, 2018).

In the latest triennial report on Great Lakes water quality, the International Joint Commission (IJC) finds that drinking water quality sourced from the Great Lakes, including Lake Ontario, and connected river systems is generally good, but local governments should make more progress in expanding information gathered by regular water quality monitoring programs (IJC, 2017). Conditions for safe swimming and recreational use of Lake Ontario public beaches are fair to good, with few closures due to health risks from sewage, agricultural runoff, or toxic algal blooms.

The IJC report assesses that levels of contaminants in edible fish that may threaten lake ecology and human health are fair (but showing improvement), with polychlorinated biphenyls (PCBs), mercury, and dioxins from past pollution still remaining in the watershed (IJC, 2017). Mirex, PCBs, and dioxin are listed as fish contaminants by the New York Department of Health (New York Department of Health, n.d.).

A variety of new “contaminants of emerging concern” (CECs) or compounds present in the environment could have impacts on human, fish, and wildlife health. Pollutants may enter the Great Lakes from air deposition, surface water, groundwater, sediment, direct discharges, and other sources. CECs now being detected in Great Lakes fish, waters, and sediments include brominated flame retardants (PBDEs), perfluorinated chemicals (perfluorooctanoic acid (PFOA), perfluorooctanesulfonic acid (PFOS), and other substances), pharmaceuticals, microplastics, and other compounds (NYSDEC, 2023). On August 20, 2020, New York revised state Public Health Law and adopted new drinking water standards for public water systems that set maximum contaminants levels (MCLs) of 10 ppt for concentrations of PFOA and PFOS (Monroe County Water Authority, n.d.).

Levels of nutrient pollution and harmful algal blooms (HABs) in Lake Ontario are at levels that cause experts some concern. The IJC report reviews nutrients in Lake Ontario and finds that excess phosphorus in runoff from both agricultural lands and urban areas is contributing to the growth of the nuisance macroalgae, *Cladophora* spp., on shorelines and beaches. Water further from shore has lower nutrients than ideal, possibly due to sequestration by non-native aquatic species, such as the quagga mussel (*Dreissena bugensis*, see Section 4.5.1.3). This condition may be disruptive to the natural lake ecology. Other native species rely on these nutrients, which are now not as readily available. The report finds that relative to target levels, these nutrient conditions are fair and deteriorating.

The IJC created a binational water quality management plan for Lake Ontario and the Niagara and St. Lawrence rivers. The plan is implemented by U.S. and Canadian federal agencies coordinating with governments of nations and tribes and state and provincial governments. In the U.S., NYSDEC is responsible for much of the water monitoring in the southern part of the watershed. The New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP) monitors NYSOPRHP beaches weekly for bacterial indicators of impaired water quality, [providing beach condition results](#)²⁵ throughout the swimming season. USGS also provides [water quality monitoring results](#)²⁶ for lake tributaries.

4.4.2 Physical Resources in the Thousand Islands Region of the St. Lawrence River

Lake Ontario discharges into the St. Lawrence River on its eastern side at Cape Vincent, New York, through the Thousand Islands, and then flows 744 miles into the Gulf of St. Lawrence, the largest estuary in the world. The river drains the 254.5-million-acre watershed of all the Great Lakes and discharges 2.7 million gallons per second into the North Atlantic Ocean (Waples et al., 2008).

²⁵ <https://parks.ny.gov/recreation/swimming/beach-results/>

²⁶ <https://waterdata.usgs.gov/ny/nwis/qw>



Figure 4.32. St. Lawrence River islands. Photo: Thousand Islands International Tourism Council

4.4.2.1 Geology (St. Lawrence River)

The most obvious features of this area are the many islands. The total count depends on the definition of an island. The 1000 Islands International Tourism Council (TI Council) puts the count at 1,864 using the standard that an island would be above water 365 days a year and support at least one living tree (1000 Islands International Tourism Council, n.d.).

The geology of the Thousand Islands area of the St. Lawrence upriver of Alexandria Bay is made of the same formations that make up the Adirondack Mountains and the Canadian Shield. Their base is billion-year-old metamorphic gneiss under layers of sedimentary sandstones and limestones eroded by glacial processes. This bedrock is exposed in many places throughout the Thousand Islands and the eastern shore of Lake Ontario (Potsdam Public Museum, n.d.).

The depth of the main navigational channels of the St. Lawrence Seaway is maintained by dredging to 27 feet but is much deeper in some areas, such as through the American Narrows off Wellesley Island, where it reaches 239 feet (Figure 4.32). Current velocity and water levels through the Thousand Islands region varies due to season and weather, with levels rising from spring snowmelt runoff and strong winds. The current is usually less than 0.7 miles per hour with water levels varying about 2 feet in height from low to high (NOAA United States Coast Pilot, 2019).



Figure 4.33. St. Lawrence shipping channel. Photo: U.S. Department of Transportation

4.4.2.2 Climate (St. Lawrence River)

The Thousand Islands area of the St. Lawrence River has climate conditions similar to those of the eastern side of Lake Ontario and shares the same lake level controlled by the Moses-Saunders dam at Cornwall, Ontario (see Section 4.4.1.2). Climate change effects are the same as those described in Section 4.4.1.2.

4.4.2.3 Water Quality (St. Lawrence River)

The main source of water to the upper St. Lawrence River is Lake Ontario. Therefore, water quality in this area is heavily influenced by the quality of the water flowing from the lake (see Section 4.4.1.3).

4.5 Biological Resources

This section describes the biological resources within eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River, including the aquatic ecosystem, terrestrial wildlife and birds, invasive species, and protected species and habitats.

4.5.1 Biological Resources Within Lake Ontario

The natural resources and ecological qualities found within eastern Lake Ontario and its coastline contribute significantly to the ecological system of the lake and its terrestrial interface. The area features significant biodiversity in fish and wildlife habitats, including fish spawning shoals critical for supporting native fish populations, which support the region's outstanding recreational fisheries. Lake Ontario waters and coastal habitats support federally and state-listed species, which are discussed in Section 4.5.4.

There are numerous bird conservation areas and significant fish and wildlife habitat areas along the shoreline of eastern Lake Ontario and the St. Lawrence River. For example, the state of New York designated several Significant Coastal Fish and Wildlife Habitats along the shoreline of eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River. These areas protect a variety of wildlife. Some of those areas extend into lake and river waters, such as at the mouth of the Oswego River, Stony Island, Stony Point, Little Galloo Island, Fox Island, Calf Island, Point Peninsula Marsh, Carlton Island, Grindstone Island, Wellesley Island, and Oak Island (New York Department of State, n.d.). There are seven Bird Conservation Areas designated by New York state along the shoreline and on the islands in the action area (NYSDEC, n.d.-b).

In 2007, New York state identified the “Eastern Lake Ontario Barrier Beach and Wetland Complex,” a 17-mile long, 5,800-acre area made up of multiple barrier beaches, embayments, dunes, and wetlands. Eastern Lake Ontario marshes and various embayments are important because of their filtering capacity that improves the lake’s water quality and ability to offer structural protection for spawning fish and small prey fish before they venture out into the open lake. The area represents the remains of one of the largest inland dune systems in the eastern Great Lakes and contains some of the highest quality freshwater marshes in New York state. The New York Department of State deemed the area a “Significant Coastal Fish and Wildlife Habitat.”



Figure 4.34. Black Pond Wildlife Management Area on the eastern shore of Lake Ontario. Photo: Geoff Steadman and Tom Hart, New York Sea Grant

4.5.1.1 Aquatic Species (Lake Ontario)

Lake Ontario contains a rare, deep, and cold freshwater ecosystem. As noted in Section 4.4.1.1, lakebed habitats range from bare bedrock, clays, and sands in the shallows to muds in the depths. Although it is not a pristine system with many non-native species disrupting native species interactions, restoration is underway for at-risk native species, such as lake trout (*Salvelinus namaycush*), lake sturgeon (*Acipenser fulvescens*), and deepwater cisco (*Coregonus johannae*). Improvement in Lake Ontario’s water quality and associated prey species population health over the last 40 years is evidenced by the successful restoration of the American bald eagle to New York state.

The area supports a large and thriving recreational fishery for native lake trout, smallmouth bass (*Micropterus dolomieu*), and walleye (*Sander vitreus*), and for introduced species, such as Chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*Oncorhynchus kisutch*), brown trout (*Salmo trutta*), and rainbow trout (*Oncorhynchus mykiss*) (see Section 4.3.2.2). Yellow perch (*Perca flavescens*) are also targeted by both recreational and commercial fishers (Section 4.3.3.1).

Along with lake trout, deepwater cisco, and Atlantic salmon, the native deepwater sculpin (*Myoxocephalus thompsoni*) and spoonhead sculpin (*Cottus ricei*) were once common throughout the deeper areas of the lake. Both sculpin are now very rare in Lake Ontario with the spoonhead considered extirpated. Non-native alewives may also occur at depth and are prey for lake trout and other gamefish (NYSDEC, 2015).

Other non-native aquatic species are discussed more below in Section 4.5.1.3, Invasive Species.

4.5.1.2 Terrestrial and Coastal Resources (Lake Ontario)

Areas of natural significance along eastern Lake Ontario include: Chimney Bluffs State Park, sculpted by the lake's unique weather; Derby Hill Bird Observatory, one of the premier locations in North America to observe migrating birds of prey; Lake Shore Marshes; Sterling Nature Center; Stony Point - Lyme Barrel Shoals; and Little Galloo Island, which is listed as an Important Bird Area by the Audubon Society (Audubon Society, n.d.).

Much of the lake shoreline is agricultural or developed as urban areas, but there are some remaining wetlands, other natural areas, and uninhabited islands that provide important habitat for terrestrial species and protect water quality in the lake watershed. Shorelines are stabilized by dune vegetation, emergent wetland vegetation, or a mixed deciduous forest of oak (*Quercus* sp.), hickory (*Carya* sp.), maple (*Acer* sp.), beech (*Fagus* sp.), and birch (*Betula* sp.) (U.S. Geological Survey, 1992; U.S. Geological Survey, 2018).

4.5.1.3 Aquatic Invasive Species (Lake Ontario)

Invasive species are non-native species that persist and cause harm to an area. Invasive species are a serious problem in the Great Lakes. More than 180 invasive and non-native species have severely damaged the Great Lakes ecosystem. Species, such as the zebra mussel (*Dreissena polymorpha*), quagga mussel (*Dreissena bugensis*), round goby (*Neogobius melanostomus*), sea lamprey (*Petromyzon marinus*), and alewife (*Alosa pseudoharengus*) reproduce and spread, ultimately degrading habitat, outcompeting native species, and short-circuiting food webs. Invasive zebra and quagga mussels have had an exceptionally significant impact on shipwrecks and maritime heritage resources, as they have an affinity for hard substrates and are commonly found attached to these sites. When first introduced into the Great Lakes in the 1980s via ballast water discharge from transoceanic ships, zebra and quagga mussels first colonized shallow, well-lit archaeological sites (O'Neill & Dextrase, 1994). However, to date, archaeologists and divers have observed significant zebra and quagga mussel infestation on shipwreck sites as deep as 300 feet.



Figure 4.35. Invasive mussels covering a submerged light beacon. Photo: Tim Caza

These adverse effects occur in Lake Ontario. New York state with USFWS has an active restoration program to restock native lake trout. Sea lamprey prey on lake trout and alewives displaced their native cisco prey (USFWS, 2019). Both sea lamprey and alewives are native to the Atlantic Ocean and most likely introduced to Lake Ontario through the construction of the Erie Canal in the early 1800s. Sea lamprey inhabit a variety of habitats in Lake Ontario and are parasitic on lake trout and ciscos. They attach to a host with a sucker-shaped jawless mouth and feed on body fluid and flesh (Kottelat & Freyhof, 2007).

4.5.1.4 Protected Species and Habitats (Lake Ontario)

This section provides an overview of the species and habitats that may occur in or near the southeastern portion of Lake Ontario included in Alternatives 1 and 2, that are protected under the Endangered Species Act (ESA) or the Migratory Bird Treaty Act (MBTA). No Essential Fish Habitat as defined under the Magnuson–Stevens Fishery Conservation and Management Act occurs within Lake Ontario.

4.5.1.4.1 Endangered Species Act Listed Species and Designated Critical Habitat (Lake Ontario)

The USFWS and the National Marine Fisheries Service (NMFS) jointly administer the Endangered Species Act (ESA) of 1973, as amended (16 USC 1531 *et seq.*). The USFWS manages the protection of, and recovery effort for, listed terrestrial and freshwater species, and NMFS manages the protection of and recovery effort for listed marine and anadromous species.

The ESA protects plant, fish, and wildlife species (and their habitats) listed as endangered and threatened. A species is defined as endangered if it is at risk of extinction throughout all, or a significant part of its range. A threatened species is one that is likely to become endangered in the near future.

When USFWS or NMFS lists a species under the ESA, they are required to designate critical habitat for the species to the maximum extent prudent and determinable (16 USC 1533(a)(3)). Critical habitat is defined as (1) specific areas within the geographical area occupied by the species at the time of listing that contain physical or biological features essential to conservation of the species and that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation of the species (16 USC 1532(5)). Section 7(a)(2) of the ESA requires federal agencies to consult with the USFWS and/or NMFS, as applicable, before initiating any action that may affect a listed species or designated critical habitat (16 USC 1536(a)(2)). See the analysis for NOAA's consultation under Section 7 of the ESA in Appendix B.2.

Action Area for Threatened and Endangered Species and Critical Habitat (Lake Ontario)

For the purposes of section 7 of the ESA, the "action area" means all areas where these species or habitats could be directly, indirectly, or cumulatively affected by the federal action and not merely the immediate area involved in the action (50 CFR 402.02). The action area effectively bounds the analysis of threatened and endangered species and habitats, because only species or designated critical habitat that occur within the action area may be affected by the federal action.

Based on these criteria, NOAA defines the action area within Lake Ontario for the purposes of ESA analysis as:

1. the portion of the proposed boundaries in eastern Lake Ontario, the main routes vessels would travel to operate within the sanctuary; and
2. shorelines, wetlands, and inland bays immediately adjacent to the portion of the proposed boundaries in eastern Lake Ontario where noise from activities would be audible to birds and other wildlife.

NOAA expects all direct and indirect effects of the proposed action within Lake Ontario to be contained within the action area as defined above. NOAA recognizes that while the action area is stationary, ESA-listed species can move in and out of the action area. For instance, a migratory bird species could occur in the action area seasonally as they forage or travel at or near the action area. Thus, in its analysis, NOAA considers not only those species known to occur directly

within the action area, but also those species that may passively or actively move into the action area for limited periods of time. NOAA then considers whether the life history of each species makes the species likely to move into the action area where it could then be affected by the proposed action.

Species and Habitat Under NMFS Jurisdiction (Lake Ontario)

NOAA has ascertained that no listed, proposed, or candidate species, or proposed or designated critical habitat under NMFS jurisdiction are known to occur within the action area in Lake Ontario.

Species and Habitat Under FWS Jurisdiction (Lake Ontario)

NOAA used the USFWS's Environmental Conservation Online System (ECOS) Information for Planning and Conservation (IPaC) tool to search for ESA-listed endangered or threatened species that may be present in the action area within Lake Ontario. The ECOS IPaC tool identified four species (Table 4.6) listed as endangered or threatened under USFWS jurisdiction that could occur in the action area (Consultation Code: 05E1NY00-2020-SLI-2428, April 23, 2021). Designated critical habitat for one species, the piping plover (*Charadrius melodus*), occurs within the action area (USFWS, 2021a). No proposed or candidate species, or proposed designated critical habitat under USFWS jurisdiction occur within the action area.

As summarized in Table 4.6, NOAA evaluated the species' habitat requirements and habitat availability within the action area and determined that all four of the listed species may occur in the action area within Lake Ontario.

Table 4.6. ESA-listed Species under USFWS Jurisdiction Potentially Found in the Action Area (Lake Ontario). Source: [U.S. Fish and Wildlife Service](#)

Common Name	<i>Latin Name</i>	Status	Habitat Requirements	Likelihood to occur within the Action Area
Indiana bat	<i>Myotis sodalis</i>	Endangered	May be found hibernating during winter in caves or, occasionally, in abandoned mines. During summer, they roost under the peeling bark of dead and dying trees. Indiana bats eat a variety of flying insects found along rivers or lakes and in uplands.	May infrequently roost, travel, or forage within riparian forests that are adjacent to eastern Lake Ontario.

Common Name	Latin Name	Status	Habitat Requirements	Likelihood to occur within the Action Area
Northern long-eared bat	<i>Myotis septentrionalis</i>	Threatened	May be found in a variety of forested and wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitat, as well as linear features, such as fence rows, riparian forests, and other wooded corridors. Suitable winter habitat includes caves and cave-like structures (e.g., abandoned or active mines, railroad tunnels).	May infrequently roost, travel, or forage within riparian forests that are adjacent to eastern Lake Ontario.
Piping plover	<i>Charadrius melodus</i>	Endangered	May nest on shoreline and island sandy beaches with sparse vegetation and the presence of small stones (greater than 1.3 cm [0.5 inch]). Piping plovers spend three to four months a year on the breeding ground during the summer. They may prey upon invertebrates that are 1 cm (0.4 inch) or less below the surface, including insects, worms, crustaceans, and mollusks, as well as eggs and larvae of flies and beetles.	May infrequently nest or forage along shoreline and sandy beaches during three to four months of the summer.
Bog turtle	<i>Glyptemys muhlenbergii</i>	Endangered	May be found in small, discrete populations, generally occupying open-canopy, herbaceous sedge meadows and fens bordered by wooded areas. (USFWS, 2001)	May occur in wetlands and wooded areas near eastern Lake Ontario.

USFWS designated critical habitat for the Great Lakes breeding population of the piping plover that covers approximately 201.9 miles of Great Lakes shorelines (66 FR 22938 (May 7, 2001)). The piping plover may infrequently occur within the action area during the limited portions of the year that they breed, forage, or migrate through Lake Ontario. One designated critical habitat unit occurs in Lake Ontario encompassing approximately 17 miles of shoreline in Jefferson and Oswego Counties, New York, from the mouth of the Salmon River to the Eldorado Road (Stony Point). The primary constituent elements required to sustain the Great Lakes breeding population of the piping plover are found on Great Lakes islands and mainland shorelines that support open, sparsely vegetated sandy habitats, such as sand spits or sand beaches, that are associated with wide, unforested systems of dunes and inter-dune wetlands (66 FR 22938).

4.5.1.4.2 Migratory Bird Treaty Act (Lake Ontario)

USFWS administers the MBTA (16 USC 701 *et seq.*), which prohibits anyone from taking native migratory birds or their eggs, feathers, or nests. Regulations under the MBTA define “take” as “to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to” carry out these activities (50 CFR 10.12). The act protects a total of 1,007 migratory bird species (75 FR 9282 (March 1, 2010)).

NOAA used the USFWS’s ECOSIPaC tool to search for migratory bird species that may be present in the area. The ECOS IPaC tool identified 22 migratory birds of concern that may occur in or near the area (Consultation Code: 05E1NY00-2020-SLI-2428, April 23, 2021; R. Niver, personal communication, April 7, 2020). These 22 bird species may be found transiting through the sanctuary and resting or foraging within the action area (see Table B.1 in Appendix B.3 for a full list).

4.5.1.4.3 State Listed Species (Lake Ontario)

NYSDEC manages a list of Endangered, Threatened, and Special Concern animal species found in the state (6 CRR-NY Part 182). The mission of the program is “To perpetuate and restore native animal life within New York state for the use and benefit of current and future generations, based upon sound scientific practices and in consideration of social values, so as not to foreclose these opportunities to future generations” (NYSDEC, 2020). Species of Special Concern are those that warrant attention and consideration, but current information does not justify listing these species as either Endangered or Threatened. The state list includes several species that may occur in the area: one Endangered and one Threatened mammal species; five Endangered, eight Threatened, and four Special Concern bird species; four Endangered, four Threatened, and one Special Concern fish species; one Endangered, one Threatened, and one Special Concern reptile species; and one Endangered and one Special Concern insect species. New York state also lists one Endangered plant species (slender bulrush, *schoenoplectus heterochaetus*) as occurring in the area. The potential occurrence of these species in the area was confirmed in discussion with the New York Natural Heritage Program (N. Conrad, personal communication, Dec. 21, 2020). These species (listed in Appendix B.4) may occur in terrestrial, wetland, and near shore habitats in the area. A complete list of species that are considered Endangered, Threatened, or of Special Concern by New York State can be found on NYSDEC’s [website](https://www.dec.ny.gov/animals/7494.html).²⁷

4.5.2 Biological Resources in the Thousand Islands Region of the St. Lawrence River

4.5.2.1 Aquatic Species (St. Lawrence River)

The upper St. Lawrence River consists of a complex array of habitats including over 1,800 islands, 2,000 shoals, and thousands of acres of nearshore freshwater littoral habitats and coastal emergent wetlands. The aquatic biological resources of the St. Lawrence River are similar to those found in eastern Lake Ontario (Section 4.5.1.1). Both areas contain diverse aquatic habitats ranging from shallow, riverine habitat with submerged aquatic vegetation beds

²⁷ <https://www.dec.ny.gov/animals/7494.html>

to deeper pools. The St. Lawrence River fish community contains a diverse array of fishes with nearly 50 species observed annually in surveys and around 85 species documented by Thousand Islands Biological Station and NYSDEC. The St. Lawrence River is home to several popular sportfish including: muskellunge, northern pike, walleye, largemouth bass and smallmouth bass. Popular panfish species include yellow perch, rock bass, black crappie, and pumpkinseed and bluegill sunfish (SUNY College of Environmental Science and Forestry, n.d.).

4.5.2.2 Terrestrial and Coastal Resources (St. Lawrence River)

The terrestrial and coastal biological resources of the St. Lawrence are similar to those found in eastern Lake Ontario (Section 4.5.1.2). As with Lake Ontario, much of the river shoreline is agricultural or developed as urban areas. The remaining wetlands, other natural areas, and uninhabited islands provide important habitat for terrestrial species and protect water quality in the watershed.

4.5.2.3 Aquatic Invasive Species (St. Lawrence River)

The invasive species of the St. Lawrence River are similar to those found in eastern Lake Ontario (Section 4.5.1.3).

4.5.2.4 Protected Species and Habitats (St. Lawrence River)

This section provides an overview of the protected species and habitats that may occur in or near the upper St. Lawrence River, included in proposed sanctuary boundaries under Alternative 1, including species and habitats protected under the ESA and the MBTA.

4.5.2.4.1 Endangered Species Act Listed Species and Designated Critical Habitat (St. Lawrence River)

NOAA performed the ESA analysis of the area of the St. Lawrence River that would be within the proposed sanctuary under Alternative 1 in the same way as that for the Lake Ontario area (see Section 4.5.1.4.1). A separate query in the USFWS ECoS IPaC system (Consultation Code: 05E1NY00-2020-SLI-2242, April 23, 2021) identified only two species (Indiana bat and northern long-eared bat) as possibly occurring in the St. Lawrence River action area and no designated critical habitat (USGS, 2021b). See Table 4.6 for a summary of the habitat requirements and likelihood of occurrence in the action area for the Indiana bat and northern long-eared bat.

4.5.2.4.2 Migratory Bird Treaty Act (St. Lawrence River)

The ECOS IPaC tool identified 17 migratory bird species, which may be found in the area of the St. Lawrence River that would be within the proposed sanctuary under Alternative 1 (Consultation Code: 05E1NY00-2020-SLI-2242, April 23, 2021; see Appendix B.3 for a full list).

4.5.2.4.3 State Listed Species (St. Lawrence River)

The waters of the St. Lawrence River and nearby shoreline habitats within the proposed sanctuary boundaries under Alternative 1 may contain many of the same state-listed species as in Lake Ontario (see Section 4.5.1.4.3 and Appendix B.4).

Chapter 5:

Analysis of Environmental Consequences of Alternatives

5.1 Introduction

This chapter evaluates the anticipated environmental effects on underwater cultural and historical resources, human uses and socioeconomic resources, physical resources, and biological resources associated with the range of alternatives as described in Chapter 3.

Analysis of the environmental consequences of the alternatives is based on review of existing literature and studies, information provided by experts, and the best professional judgment of NOAA staff. Potential impacts fall under three types: direct, indirect, and cumulative. These types of impacts are defined in the 1978 regulations issued by CEQ as follows:

Direct Impact: A known or potential impact caused by the proposed action or project that occurs at the time and place of the action (40 CFR 1508.8 (1978)).

Indirect Impact: A known or potential impact caused or induced by the proposed action or project that occurs later than the action or is removed in distance from it but is still reasonably expected to occur (40 CFR 1508.8 (1978)).

Cumulative Impact: A known or potential impact resulting from the incremental effect of the proposed action added to other past, present, or reasonably foreseeable future actions (40 CFR 1508.7 (1978)).

5.1.1 Significance of Potential Impacts

To determine whether an impact is significant, the CEQ regulations (40 CFR 1508.27 (1978)) and NOAA guidance (NAO 216-6A) require the consideration of context and intensity of potential impacts.

Context is the setting within which an impact is analyzed, such as the affected region or locality and the affected interests. In this Environmental Impact Statement (EIS), the direct and indirect impacts are evaluated within a local context, primarily examining how each alternative would affect the human environment within the proposed sanctuary and whether those effects would be short term or long term. The geographic area of interest for cumulative impacts is a slightly broader regional context in order to consider overlapping and compound effects with other past, present, or reasonably foreseeable future actions.

Level of **intensity** refers to the severity of the impact. The various levels of impact used in this analysis are:

Negligible: Impacts on a resource can barely be detected (whether beneficial or adverse) and are therefore discountable.

Moderate: Minor impacts that are greater than negligible but do not rise to the level of significance as defined below.

Significant: An impact resulting in an alteration in the state of a resource. Long-term or permanent impacts or impacts with a high intensity or frequency of alteration to a resource, whether beneficial or adverse, would be considered significant. The significance threshold is evaluated on a case-by-case basis, taking into consideration the context and intensity of each action.

5.1.2 Quality of Potential Impacts

Potential impacts are described as either beneficial or adverse as follows:

Beneficial impact: Impacts that promote favorable conditions for the resource.

Adverse impact: Impacts that are contrary to the goals, objectives, management policies, and practices of NOAA and the public interest or welfare. Impacts that are likely to be damaging, harmful, or unfavorable to one or more of the resources.

5.1.3 Approach to Environmental Consequences Analysis

NOAA evaluated the impacts on each resource area in the context of each of the components of the alternatives: sanctuary boundary, sanctuary regulations, and the sanctuary management plan and field activities. In evaluating impacts, NOAA considered the following questions:

Boundary: How does the amount of area within the proposed sanctuary affect the resources, natural environment, and human uses in and around the proposed sanctuary?

Regulations: How do the type and amount of proposed regulations to protect sanctuary resources affect the resources, natural environment, and human uses in and around the proposed sanctuary?

Management plan and field activities: How do the activities to manage and operate the proposed sanctuary affect the level of protection of the sanctuary's resources and public stewardship of those resources?

The environmental consequences analysis is organized as follows:

Impacts from the No Action Alternative: Section 5.2 describes the impacts from the No Action Alternative where NOAA would not designate the proposed Lake Ontario National Marine Sanctuary.

Impacts from Alternative 1 (eastern Lake Ontario and Thousand Islands region): Section 5.3 describes the impacts from Alternative 1. This alternative would include:

- Designating a national marine sanctuary within eastern Lake Ontario and the Thousand Islands region (see Section 3.4.1)
- Implementing proposed sanctuary-wide regulations (see Section 3.4.2)
- Implementing the proposed management plan and associated field activities (see Section 3.4.3)

Impacts from Alternative 2 (eastern Lake Ontario only): Section 5.4 describes the impacts specific to Alternative 2. This alternative would include:

- Designating a national marine sanctuary within eastern Lake Ontario (see Section 3.5.1)
- Implementing proposed sanctuary-wide regulations (see Section 3.5.2)
- Implementing the proposed management plan and associated field activities (see Section 3.5.3)

Cumulative Impacts: Section 5.5 analyzes the impact on the environment, which would result from the incremental impact of the alternatives when added to other past, present, and reasonably foreseeable future actions.

5.2 Impacts of the No Action Alternative

Under the No Action Alternative, NOAA would not designate a national marine sanctuary. If NOAA does not designate a sanctuary in Lake Ontario, NOAA would not promulgate regulations under the National Marine Sanctuaries Act; implement a management plan to protect and manage underwater cultural and historical resources in the area; provide resources for research and monitoring, enforcement, education, or outreach; or otherwise maintain a presence in eastern Lake Ontario.

NOAA expects that implementation of the No Action Alternative would not result in any change in the existing management of the underwater cultural and historical resources in eastern Lake Ontario and the St. Lawrence River or any change in the existing uses of the study area. Based on this assumption, NOAA determined that the No Action Alternative would forgo the beneficial and adverse impacts of implementing Alternative 1 (see Section 5.3) and Alternative 2 (see Section 5.4) on the resources and human uses in and around the proposed sanctuary. Generally, these impacts would be the forgone benefit of implementing regulations and a management plan to provide comprehensive, long-term management of underwater cultural and historical resources located within the proposed sanctuary.

5.3 Impacts of Alternative 1

This section describes the beneficial and adverse impacts from implementing Alternative 1, which includes the following components, described in detail in Chapter 3:

- **Boundary:** 1,786 square miles of eastern Lake Ontario from the border of Wayne County, extending lakeward to the Canadian border and into the St. Lawrence River, from the mouth of the river to Chippewa Bay northeast of Oak Island.
- **Proposed Regulations:**
 - Moving, removing, recovering, altering, destroying, possessing, or otherwise injuring, or attempting to move, remove, recover, alter, destroy, possess, or otherwise injure a sanctuary resource;
 - Possessing, selling, offering for sale, purchasing, importing, exporting, exchanging, delivering, carrying, transporting, or shipping by any means any sanctuary resource within or outside of the sanctuary;
 - Grappling into or anchoring on shipwreck sites;
 - Deploying a tethered underwater mobile system at shipwreck sites;

- Interfering with, obstructing, delaying or preventing an investigation, search, seizure, or disposition of seized property in connection with enforcement of the Act or any regulation or any permit issued under the Act.

The prohibitions would not apply to any activity necessary to respond to an emergency threatening life, property, or the environment; or to activities necessary for valid law enforcement purposes.

- **Management plan and associated field activities:** The management plan describes actions and strategies that NOAA intends to implement over time to protect the nationally significant resources within the proposed sanctuary, to help conserve and promote the shipwrecks that have been located and those that await discovery, and to foster sustainable use of the proposed sanctuary (see Appendix A for the management plan.)

5.3.1 Impacts on Underwater Cultural and Historical Resources (Alternative 1)

Beneficial Impacts on Underwater Cultural and Historical Resources

Implementing Alternative 1 would have the following types of beneficial impacts on underwater cultural and historical resources in the study area:

- Direct protection of sanctuary resources through regulations and components of the management plan that would directly protect underwater cultural and historical resources from disturbance and physical damage;
- Enhanced management of underwater cultural and historical resources from information gained through research and monitoring activities; and
- Increased stewardship of underwater cultural and historical resources by conducting community outreach activities that help foster awareness of these resources.

Direct Protection of Underwater Cultural and Historical Resources

Under Alternative 1, NOAA would directly protect underwater cultural and historical resources in eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River from injury and disturbances by developing regulations and implementing a long-term, comprehensive management plan. The regulations would protect underwater cultural and historical resources by prohibiting moving, removing, recovering, altering, destroying, possessing, or otherwise injuring a sanctuary resource; prohibiting the use of anchors and grappling hooks at shipwreck sites; and requiring a permit for the operation of tethered underwater mobile systems. NOAA's proposed regulations would complement existing federal and state regulations to increase preservation and provide uniform protection for all underwater cultural and historical resources throughout the sanctuary. These regulations enforce the principles of *in situ* preservation of underwater cultural and historical resources in the sanctuary to maintain their long-term integrity.

NOAA would also directly protect underwater cultural and historical resources located within the proposed Alternative 1 sanctuary boundaries by developing a mooring program to prevent potential damage that may be caused by anchoring on or grappling directly into the structure of

a shipwreck. The use of anchors and grappling hooks can damage shipwrecks due to entangling, tearing, breaking, or other physical disturbances of the shipwrecks. A mooring program would prevent such damage by installing U.S. Coast Guard approved moorings that provide a secure and convenient anchoring point for users to access shipwreck sites. This would eliminate the need for grappling to locate shipwrecks and for anchoring directly into a shipwreck site. In addition, the moorings would provide clear notice to boaters of the presence of a known shipwreck site.

The installation of mooring buoys would be phased in following sanctuary designation. To help prevent damage and ensure compliance with the prohibition in areas where moorings are not yet present, NOAA would publish guidelines to promote the use of best practices for anchoring near shipwreck sites. An example of a best practice could include instructions on using a weighted line and surface float (shot line) to mark a wreck for divers to descend and ascend that is removed before the dive boat leaves the area. These activities would increase recreational and aesthetic value through long-term preservation/stabilization of underwater cultural and historical resources.

NOAA is proposing to require a permit for the use of tethered ROV systems at shipwreck sites. ROVs pose incidental threats to shipwreck sites via entanglement and also have the capability to injure a sanctuary resource. Likewise, many such systems have sacrificial ballast systems that, once jettisoned, can diminish the aesthetic properties of a site. By managing these activities through a permitting process, NOAA would be able to reduce potential impacts by requiring that such activities follow best practices to reduce likelihood of damage.

While NOAA would not regulate towed systems such as side-scan sonar, NOAA would publish best practices that would help users conduct activities in a manner that would decrease possible impacts.

Enhanced Management of Underwater Cultural and Historical Resources through Research and Monitoring

Under Alternative 1, NOAA's designation of a sanctuary would enhance the management of underwater cultural and historical resources through collection of data and information to support informed management decisions. For example, to mitigate the impact of marine debris (e.g., fishing gear) on shipwreck sites, NOAA has included actions in its management plan to assess the amount and type of marine debris found on shipwrecks and then work with community partners to remove debris from the sanctuary. In addition, NOAA would conduct research and monitoring programs that would fill important gaps in archaeological knowledge and historical context of these shipwrecks. As part of its resource protection action plan under Alternative 1, NOAA would conduct research to assess and collate baseline data on the 63 known shipwrecks and one known aircraft, and their associated artifacts. NOAA or its partners may also survey for the 19 possible shipwrecks and three aircraft reported as lost within the proposed sanctuary boundary. NOAA would collect data addressing eligibility for the National Register of Historic Places and the condition of the sites using various methodologies, including such activities as scuba, ROV, and towed instrument or remote sensing surveys. NOAA would use this information to identify shipwrecks for protective measures, such as installing mooring buoys to prevent anchor damage.

In order to assess changes to the resource's stability over time, NOAA would develop and implement a monitoring program for underwater cultural and historical resources in the sanctuary. NOAA would also develop a climate adaptation plan that identifies actions to increase the resilience of sanctuary resources to climate change. These proposed research and monitoring activities would inform long-term management of the underwater cultural and historical resources.

Enhanced Stewardship through Education and Outreach Activities

Under Alternative 1, NOAA's implementation of education, outreach, and community engagement programs would enhance protection of underwater cultural and historical resources in the sanctuary by fostering awareness and stewardship of these resources. The proposed sanctuary's draft management plan includes strategies for promoting public education about sustainable and responsible use of underwater cultural and historical resources. NOAA anticipates that under Alternative 1, its education and outreach efforts would enhance public appreciation of the historical significance of the proposed sanctuary's resources and encourage public stewardship of the area. For example, NOAA would promote marine technology with educators and develop outreach programs that endorse sanctuary resource protection, such as publicizing best management practices for scuba divers to minimize their impacts while wreck diving.

Summary of Beneficial Impacts on Underwater Cultural and Historical Resources (Alternative 1)

Overall, NOAA determined that the **beneficial** impacts on underwater cultural and historical resources from implementing Alternative 1 would be **significant** due to the direct and permanent protections that would be provided by implementing regulations to prohibit harm or injury to shipwrecks, conducting research and monitoring activities to inform long-term management, and the indirect benefits of enhancing stewardship through outreach initiatives.

Adverse Impacts on Underwater Cultural and Historical Resources

Implementing Alternative 1 would have the following **minor adverse impacts** on underwater cultural and historical resources in the study area due to increased site visitation. NOAA-led field activities to support management of the proposed sanctuary include vessel operations and maintenance; scuba operations; deployment of AUVs, ROVs, gliders, and drifters; archaeological site investigation; and deployment of equipment on the lakebed (i.e., installing mooring buoys). These activities have the potential to cause adverse impacts.

Deploying AUVs, ROVs, and remote sensing equipment to better document underwater cultural and historical resources within the proposed sanctuary carries a slight risk of entanglement or accidental contact with a wreck. However, NOAA operators are highly trained, deploy these types of vehicles regularly, and follow NHPA protocols that describe how to avoid harm to sanctuary resources.

Scuba diving during field activities can injure sanctuary resources if divers use improper diving techniques and make physical contact with a wreck. Under Alternative 1, NOAA would conduct scuba diving operations as part of its research efforts to study known and possible shipwrecks within the proposed sanctuary. NOAA divers would adhere to the established NOAA guidelines

for diving and any invasive archaeological site work would be permitted following NOAA protocols in coordination with the state of New York.

While recreational diving has occurred for decades and most divers responsibly follow best management practices, poorly trained or careless recreational divers could damage underwater cultural and historical resources by using improper diving techniques. Designating the national marine sanctuary may increase non-NOAA dive traffic on the wrecks, and installing mooring buoys at wreck sites may concentrate diving activity on certain wrecks. However, implementing the proposed sanctuary regulations, mooring program, permitting system, and increasing enforcement in the area would help minimize any direct impacts to the shipwrecks. Similarly, NOAA's education and outreach efforts would promote responsible diving practices and increase public appreciation and stewardship of these sanctuary resources.

Overall, NOAA determined that any adverse impacts on underwater cultural and historical resources from implementing Alternative 1 would be **negligible** due to best management practices NOAA would follow during research and other field activities, the mooring program that would limit direct interactions with shipwrecks by divers, regulations to prohibit harm or injury to shipwrecks, and outreach programs that would encourage public stewardship.

5.3.2 Impacts on Socioeconomic Resources and Human Uses (Alternative 1)

Under Alternative 1, NOAA would bring resources and national visibility to provide coordinated promotion of regional recreational activities and human uses within the designated sanctuary area.

Beneficial Impacts on Socioeconomic Resources and Human Uses

Implementing Alternative 1 would have the following types of beneficial impacts on socioeconomic resources and human uses in eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River:

- Increased maritime heritage tourism and improved recreational experiences
- Transfers and positive economic contributions from increased recreational and tourism spending in the local economy
- Increased non-market value from sanctuary designation
- Reduced entanglement of fishing gear and related costs to commercial and recreational fishing
- Increased investment from research activities

Improved Heritage Tourism and Recreational Experiences

Tourism and economic development are important aspects of the proposed sanctuary. The communities that nominated the area to become a sanctuary (four counties and the city of Oswego) cited economic development in the bordering communities to the sanctuary as one of their primary goals for submitting the nomination. The Sanctuary Advisory Council has four out of 15 seats dedicated to tourism and economic development. NOAA's management plan (Appendix A) that would be implemented if the sanctuary is designated through the proposed rule, contains several strategies and objectives that focus on promoting the sanctuary to the

public and improving recreational experiences within the sanctuary. NOAA also has a national Business Advisory Council (BAC) that provides guidance to NOAA on engaging the recreation and tourism sectors across the entire National Marine Sanctuary System and on leveraging the recreational, cultural, and aesthetic values of national marine sanctuaries to build strong local economies and engaged communities. If the sanctuary is designated, NOAA would utilize the BAC to increase public awareness of the new sanctuary.

NOAA also has a robust communications and education program that focuses on educating the country about national marine sanctuaries, as well as encouraging the public to visit and use sanctuaries in a responsible manner. NOAA's social media campaigns have the potential to reach tens of thousands of people annually. NOAA's promotion of the new sanctuary would likely attract more tourists to the area, such as divers interested in viewing shipwrecks and tourists interested in maritime history.

Upon sanctuary designation, NOAA would implement research, interpretation, outreach, and education activities associated with the proposed sanctuary. NOAA anticipates that these activities would have a positive impact on tourism by heightening public awareness of, and interest in, the underwater cultural and historical resources found in Lake Ontario. NOAA would use its own resources and assets, as well as partnerships with other organizations, to fill gaps in archaeological knowledge and historical context of these wrecks, as well as discover new resources. These activities often receive local and national news coverage, which raises national awareness about national marine sanctuaries and the resources within them. In addition, national marine sanctuaries are often featured in film documentaries made to educate the general public, both within and outside the United States, about the marine environment.

NOAA's education staff would implement education and outreach programs for K–12 schools, post-graduate programs, and the general public, which would also increase the public's awareness of the new sanctuary. For example, NOAA runs the Ocean Guardian School Program and the NOAA Bay Watershed Education and Training (B-WET) program, which teach children in coastal states and territories about their local watersheds and the ocean and Great Lakes environments, conservation, and the National Marine Sanctuary System. If Lake Ontario National Marine Sanctuary is designated, information about Lake Ontario and the nationally significant underwater cultural and historical resources in the sanctuary would be added to these types of programs. Advertising and education would create value to the proposed sanctuary and sanctuary community by not only increasing name recognition of the sanctuary, but also increasing name recognition of the surrounding communities.

As part of the management plan that NOAA would implement if LONMS is designated, NOAA would work with state and local partners to create public exhibits, improve outreach, and raise awareness and knowledge to enhance the visitor experience. For example, designating the sanctuary would complement and enhance existing maritime heritage initiatives locally, at the state level, and regionally. This increased coordination and potential exposure of the site may attract and encourage divers, snorkelers, boaters, and maritime enthusiasts to visit maritime resources while following best management practices to reduce adverse impacts. While the specific efforts and partners would be determined as part of the implementation of the sanctuary management plan, NOAA's top priority would be creating opportunities for people to learn

about and visit the proposed sanctuary. NOAA would likely partner with existing institutions, such as area maritime museums, among others, to develop exhibits and programs.

NOAA anticipates that sanctuary designation would increase visitation to and appreciation for the historical and cultural resources within the proposed sanctuary. For instance, if NOAA designates the sanctuary through this proposed rule, NOAA would then be able to distribute maps to help users understand the location and layout of shipwreck sites and to implement a mooring program to make shipwrecks more accessible. Mooring buoys would make it easier for divers to locate wrecks by marking their specific locations and would provide a sturdy means of descent and ascent for divers. As appropriate, NOAA would update the maps as new shipwreck sites are found, thus increasing the number of known sites for divers to visit.

The Canadian side of Lake Ontario currently has many more mooring buoys and other infrastructure conducive to diving than the U.S. side (Save Ontario Shipwrecks, n.d.). Therefore, some divers interested in Lake Ontario and Thousand Islands shipwreck sites choose to spend their money in Canada as opposed to the area proposed for sanctuary designation through the proposed rule, which is located in the U.S. Designating a sanctuary in Lake Ontario has the potential to attract more recreational divers to the U.S. side of Lake Ontario by making it easier to access the shipwrecks. NOAA would also add interpretive materials on the Lake Ontario shoreline to highlight shipwrecks located offshore, which would enhance the experience for visitors who do not dive but wish to learn about the maritime history of the area.

Based on the anticipated increase in tourism driven by (a) the name recognition associated with the significance of becoming a national marine sanctuary, (b) the research, education, and outreach programming that NOAA would undertake after designation, and (c) improved recreational experiences for visitors to the area, it is expected that the sanctuary designation will have **beneficial** impacts to human use in the region. However, given the absence of more detailed baseline data specific to the proposed sanctuary designation, NOAA is unable to state the degree of effects with certainty.

Transfers and Positive Economic Contributions from Increased Recreation and Tourism Spending in the Local Economy

The natural, recreational, and underwater cultural and historical resources located in eastern Lake Ontario and the Thousand Islands region are integral to the region's current economy, support a vibrant quality of life, and create a unique sense of place. An increase in the number of tourists visiting the proposed sanctuary could continue to benefit the local economy in many ways. The increase in tourism may result in an associated increase in potential revenue if tourists stay at hotels, eat at restaurants, purchase supplies from dive shops, and visit other local businesses. Such business may be newly established or enhanced from the increased visitation.

The communities adjacent to Thunder Bay National Marine Sanctuary (TBNMS) in Michigan are similar to the communities bordering the proposed LONMS. They can all be described as historical Great Lakes port cities that have experienced a transition from industry to tourism opportunities that promote the enhanced quality of the Great Lakes. In addition, TBNMS is another sanctuary that is focused solely on protecting and managing underwater cultural and historical resources. In fact, the proposed Lake Ontario sanctuary nomination noted the success of TBNMS in Alpena as a reason for pursuing a sanctuary in Lake Ontario. A study completed

for TBNMS by the National Marine Sanctuary Foundation found that 48% of all visitors to the area reported that the NOAA Great Lakes Maritime Heritage Center (the NOAA visitor center in Alpena, Michigan) and/or the Alpena Shipwreck Tours had considerable influence on their decision to visit the area. Further, 56% of visitors stated it was the first time they visited the area (Schwarzmann et al., 2020a). Using TBNMS as an example, NOAA determined that the proposed sanctuary in Lake Ontario would result in economic transfers due to the potential increase in revenue and contributions to the local economy from higher tourism spending. Based on NOAA's experience implementing sanctuaries in other Great Lakes communities, NOAA expects that these positive transfers may occur in eastern Lake Ontario because of local users providing new or increased support to businesses within the study area that rely on or utilize sanctuary resources.

Additionally, economic effects are expected as a result of new users entering the study area to utilize the sanctuary and/or businesses that rely on sanctuary resources. When users from outside the study area visit the region and spend money, this is "new" money entering the study area economy. Further, it is possible that some locals may now decide to stay within the study area, recreate, and frequent businesses that use or rely on sanctuary resources. If people decide to stay within the study area for tourism and recreation rather than leave for experiences elsewhere, there would be a positive effect on the local economy as more spending is retained within the region.

Although it is expected that the sanctuary designation will have positive effects for the local economy, NOAA is unable to state the economic effects with certainty given the absence of baseline data specific to the Lake Ontario proposed rule. However, the similar heritage-based sanctuary TBNMS has been shown to support economic activity. A 2018 study in TBNMS (referenced above) found that spending in the study area by those who used the Great Lakes Maritime Heritage Center and Alpena Shipwreck Tours totaled \$32.4 million and supported nearly 500 jobs and \$40.0 million in output. Visitors to the region accounted for 88% of the total spending (Schwarzmann et al., 2020b). NOAA expects a sanctuary designation to not only support existing and new economic activity in the local area, but also to create positive effects for the region and nation through building increased awareness of the area and improving the recreational experience for visitors.

In the short term, NOAA determined that the immediate **beneficial impacts** on tourism and local economies from implementing Alternative 1 would be **negligible** due to the minor anticipated increase in visitation and associated potential revenue and positive contributions to the local economy from tourists staying at hotels, eating at restaurants, purchasing supplies from dive shops, and visiting other local businesses. This change in spending would be driven by an immediate negligible beneficial impact on land-based tourism, recreational diving, and snorkeling. However, in the long run as infrastructure is built and brand recognition increases, NOAA determined that the **beneficial impacts** on tourism and local economies from implementing Alternative 1 would be **moderate**, primarily driven by the expected increase in land-based tourism. National visibility and regional coordination of sanctuary messaging and promotion of regional visitor opportunities would likely attract more tourists, including divers interested in viewing shipwrecks.

Increased Non-Market Value from Sanctuary Designation

Many of the goods and services provided by cultural and heritage resources are challenging to estimate economically as they are not bought and traded in the market to yield benefits. These benefits are split into two types: use value and non-use value. Willingness to pay (WTP) is mathematically defined as the area below the demand curve for a good or service and includes both use and non-use value. Use value can be estimated using several methods, including the travel cost method. Use value may be impacted by the number of shipwrecks protected and the level of investment in museum exhibits, maritime heritage trails (including virtual trails using video and mobile phone technology), and educational workshops on maritime heritage and training in maritime archaeology.

While use value comes from the direct enjoyment of resources, non-use value is comprised of option value (the value people place on the option to use the resource in the future), existence value (the value of knowing a resource or place exists), and bequest value (the value of knowing that the resource will be available to future generations). Non-use value is typically estimated using stated preference surveys that elicit willingness to pay. Even if a person must spend money to access the resource, such as an entrance fee to a park, the price of admission does not reflect their true value. The difference between the price a person pays and the most they would be willing to pay for the good or service is what economists refer to as consumer surplus. This consumer surplus is a person's non-market value and does not require a person to actually use the resource.

Although no studies have been conducted to estimate the use or non-use value of shipwrecks in the proposed sanctuary, there is evidence that both users and non-users have willingness to pay for the protection of underwater historical and cultural resources, such as shipwrecks (Whitehead and Finney, 2003; Mires, 2014). Further, a study published in 2016 found that households have a marginal value per history-focused national parks of \$3.87.²⁸ When aggregated across all households within the U.S., the marginal value per historic site is hundreds of millions of dollars (Haefele et al., 2016). It is reasonable to assume that the members of the public, both users and non-users, similarly value protecting underwater cultural and historical resources throughout the country, including in national marine sanctuaries.

NOAA determined that the **beneficial impacts** to the general public from increased non-market value and name recognition provided by the community from a sanctuary designation would be **significant**. The significant beneficial impact can be attributed to the fact that to receive consumer surplus from the sanctuary designation, a person does not have to actually use the resource, they only must value the protections. Consequently, unlike the previous sections on human use and the local economy, this section accounts for the benefits received by both users and nonusers of a sanctuary designation.

Reduced Entanglement of Fishing Gear and Related Costs to Commercial and Recreational Fishing

The proposed action does not include any regulations specific to fishing activities. Implementing sanctuary management activities under Alternative 1 could indirectly benefit commercial and

²⁸ The \$3.87 figure is in 2016 dollars.

recreational fishing by reducing the likelihood of fishing gear entanglement with shipwrecks or other lake bottom structures that could tear, damage, or otherwise destroy fishing gear. For example, the proposed sanctuary management plan includes efforts to better characterize the lake bottom, including the location of structures that could damage fishing gear, installing buoys to clearly identify shipwreck locations, and disseminating information to the public through maps, websites, signage, etc. These activities would benefit commercial and recreational fishing by helping fishers avoid these known shipwreck locations. NOAA determined that the **beneficial impacts** on commercial and recreational fishing from implementing Alternative 1 would be **negligible** due to the small reduction in the likelihood of fishing gear entanglement with shipwrecks or other lake bottom structures that could tear, damage, or otherwise destroy fishing gear from improving public knowledge of shipwreck locations. NOAA does not anticipate any adverse impacts on recreational or commercial fishing.

Increased Investment from Research Activities

Under Alternative 1, designating a national marine sanctuary would support collaboration with local partners on research and resource protection goals. These partnerships could result in increases in vessel operations for research; scuba operations for research and monitoring; deployment of moorings and research equipment on the lakebed; the use of AUVs, ROVs, and similar equipment for research and monitoring; use of uncrewed aerial systems; and the use of active acoustic equipment. Conducting these activities would have beneficial impacts on the sanctuary's resources and would also result in increased spending in the study area. NOAA determined that these **beneficial impacts** from increased spending due to increased research activity would be **negligible**.

Adverse Impacts on Human Uses and Socioeconomic Resources

Implementing Alternative 1 would have the following minor adverse impacts on human uses in the study area due to increased site visitation. The number of boats operating within the proposed sanctuary would likely increase under Alternative 1. This small projected increase in boats could potentially cause conflicts among users, especially in the St. Lawrence Seaway, which is a narrow river with heavy shipping traffic and several dive sites. Given that the increase in boating tourists would be relatively small compared to overall boating activity in eastern Lake Ontario and the Thousand Islands region, and tourists would remain within the proposed sanctuary for a limited amount of time, NOAA does not expect a large increase in boat traffic. The mooring buoy program and NOAA-issued maps would also help minimize the likelihood of user conflicts because industry and recreational boaters would be aware of, and avoid, popular dive locations and shipwrecks. In consultation with state and federal agencies, NOAA would not install moorings that would be a navigational hazard to ship traffic.

Implementing Alternative 1 would have a **negligible, indirect, adverse impact** on commercial shipping in the study area. If diving and recreational boating activity increases in the St. Lawrence River, this could make navigation more difficult for commercial vessels and potentially introduce safety concerns due to divers and being in close proximity to heavily trafficked shipping lanes.

Commercial vessels would not be directly affected by the proposed sanctuary regulations for the following reasons:

- Sanctuary regulations would apply only to protection of underwater cultural and historical resources, so these regulations would not impede the operation of vessels.
- The Port of Oswego and federal anchorage areas would be excluded from the sanctuary boundaries, so sanctuary regulations would not impose any restrictions on vessels in these areas.
- Due to the U.S. Coast Guard Authorization Bill of 2015,²⁹ the U.S. Coast Guard and U.S. Environmental Protection Agency regulations that prohibit ballast water exchange in national marine sanctuaries would not apply to this proposed sanctuary, since this is a Great Lakes sanctuary that would protect maritime heritage resources.

NOAA determined that any **adverse impacts** on human uses in the study area from implementing Alternative 1 would be **negligible** in both the short and long run based on the relatively small expected increase in boats and divers on the lake, the implementation of the mooring buoy program, and distribution of maps to clearly mark popular diving locations, which reduces potential for user conflicts.

Human Uses of the Proposed Sanctuary that Would Not be Impacted

Implementing Alternative 1 would have **no impact** on military activities because the proposed sanctuary regulations would not limit military activities, such as pilot training in the military restricted area (R-5203) and water bucket training from Fort Drum and the NYANG.

The proposed sanctuary designation would likely have **no impact** on energy generation or transmission because the proposed sanctuary regulations would not limit responsibly sited development. Energy generation and transmission projects are typically subject to rigorous federal and state review to minimize impacts to historic resources and are therefore unlikely to directly affect sanctuary resources. In addition, education and public outreach would foster greater awareness of sanctuary resources and lead to impact avoidance during project planning.

5.3.3 Impacts on Physical Resources (Alternative 1)

Under Alternative 1, proposed regulations and management plan objectives would be designed to protect underwater cultural and historical resources in the proposed sanctuary. NOAA would conduct management activities to further these objectives, which may increase some negative effects on physical resources in the action area. The proposed sanctuary designation may also attract more public users to the area, resulting in increased boat traffic.

Beneficial Impacts on Physical Resources

Implementing Alternative 1 would benefit physical resources in the action area by reducing the potential for disturbance of the lakebed and shorelines through proposed regulatory provisions for underwater cultural and historical resources.

Under Alternative 1, NOAA would prohibit anchoring and the use of grappling hooks on a shipwreck site. Although the purpose of the proposed prohibition is to protect underwater cultural and historical resources, the prohibition could also have beneficial impacts on physical resources by reducing disturbance of the lakebed surrounding sanctuary resources. Anchoring

²⁹ (16 USC 1431 note, as amended by Pub. L. No. 114–120, 120 Stat. 27 (2016))

can result in gouging depressions into sediment or creating new holes in substrate if anchors are dragged along the lakebed or dropped in soft sediments. Altering the lakebed structure and other physical interactions between the anchor and the lakebed could stir up or resuspend sediments, causing localized increases in turbidity. Especially in the Thousand Islands area, users accessing sites close to shore may anchor vessels near shore and tie stabilizing lines to island trees or other vegetation or anchor on shore. This activity may damage and displace vegetation and ground cover, increasing erosion and degrading water quality.

Installing mooring buoys at popular shipwreck sites would provide users a means of anchoring their vessels close to shipwrecks and would eliminate most disruption of sediments, shorelines, and possible water quality degradation that may be caused by anchoring to islands or the lakebed. Therefore, prohibiting anchoring on shipwreck sites and encouraging the use of mooring buoys would limit lakebed disturbance, thereby resulting in a beneficial impact on islands, lakebed, and water quality. Additionally, management plan activities focused on research, education, and protection of underwater cultural and historical resources would include promoting best practices for accessing shipwreck sites, which may protect sites and the physical surroundings from anchor damage.

Regulations that prohibit moving, removing, recovering, or otherwise injuring underwater cultural and historical resources, such as shipwrecks, would also indirectly protect the lakebed below and near the shipwreck. Recreational divers would not be allowed to cause any injury or take any underwater cultural and historical resources; therefore, if damage to these resources were restricted, damage to the adjacent and underlying lakebed would be less likely to occur because less activity would be concentrated near the shipwreck sites.

Overall, NOAA determined that implementing Alternative 1 would have **negligible, beneficial impacts** on physical resources due to the small area of lakebed or shoreline that would be protected from disturbance by proposed regulatory provisions for underwater cultural and historical resources.

Adverse Impacts on Physical Resources

Implementing Alternative 1 would have the following minor adverse impacts on physical resources in the action area from increased site visitation:

- Minor disturbance of the lakebed through conducting sanctuary management activities (incidental or intentional)
- Localized, temporary decline in water quality
- Generation of air emissions from increased tourism, recreation, and on-water sanctuary management activities

Minor Disturbance of the Lakebed and Shorelines in Small Areas

Under Alternative 1, NOAA would implement management activities to protect underwater cultural and historical resources, such as installing and maintaining mooring buoys and other equipment on the lakebed, which could result in direct, localized disturbances to the physical properties of the lakebed. Installation of a mooring system may require placing a steel block (typically a train wheel) on the lakebed or other similar installation technique. This activity

could very minimally change the structural properties of the lakebed. However, adverse impacts from installation and maintenance of mooring buoys and lakefloor equipment would be minor due to the very small area that would be directly disturbed (less than 21 square feet). NOAA would implement best management practices, such as selecting installation sites that avoid important lakefloor structures, in order to minimize adverse impacts to the lakebed.

Under Alternative 1, anticipated increased visitor vessel use and anchoring near shore to visit shipwreck locations could cause increased erosion to shoreline soils and exposed rocks, which may also cause localized water quality degradation. There are only a few areas of shoreline with shipwreck sites nearby that would be affected, and these effects could be avoided by implementing future mooring installations and educational outreach for responsible access to shipwrecks for diving and vessels. Proportionally, there are more shipwreck sites near shore in the St. Lawrence River area than eastern Lake Ontario, so shoreline physical effects from dive site access and mitigating effects from sanctuary management activities may be greater there.

Potential for Localized, Temporary Decline in Water Quality

Under Alternative 1, NOAA-led and recreational vessel operations, including the installation and maintenance of mooring buoys, could result in a localized, temporary degradation of water quality during certain activities. Turbidity could temporarily increase during the installation and maintenance of mooring buoys when NOAA would use drills or other tools to anchor equipment to the lakebed. Vessel operations could result in minimal adverse impacts to water quality due to the small potential for a localized decline in water quality from unintended pollution spills from sanctuary vessels. NOAA must comply with relevant federal statutes, NOAA Small Boat Program guidelines, and NOAA ONMS vessel best management practices and standing orders to minimize the likelihood of a spill and limit the impacts if a spill were to occur. Any localized decline in water quality associated with placement of equipment on the lakebed would dissipate quickly because the extent of disturbance to the lakebed would be very small.

Low Generation of Air Emissions

Under Alternative 1, NOAA-authorized vessel operations and a potential increase in recreational boating activity could have adverse effects on air quality from the generation of emissions. However, NOAA anticipates a relatively low number of field activities involving vessel operations in the proposed sanctuary (see Section 3.4.3.2). In addition, as part of its larger stewardship mission in the marine environment, NOAA has converted its research vessels in the Great Lakes from petroleum-based fuels and lubricants to renewable and environmentally-friendly products that reduce fossil fuel emissions (NOAA Great Lakes Research Laboratory, 2020). NOAA would also minimize impacts of air emissions from NOAA-authorized vessel activity by complying with relevant federal regulations, NOAA Small Boat Program guidelines, and NOAA ONMS best management practices. Therefore, NOAA would release negligible amounts of greenhouse gasses when conducting field activities on the water. Education and outreach efforts would help promote responsible use of the sanctuary by recreational boaters and increase public appreciation and stewardship of these resources.

Summary of Adverse Impacts on Physical Resources

Overall, NOAA determined that adverse impacts on the lakebed, water quality, or air quality from implementing Alternative 1 would be **negligible** due to best management practices NOAA would follow during research and other field activities, and the small level of field activities NOAA would implement compared to existing vessel activities occurring in the action area.

5.3.4 Impacts on Biological Resources (Alternative 1)

Under Alternative 1, proposed regulations and management plan objectives would be designed to protect underwater cultural and historical resources in the proposed sanctuary. NOAA would conduct management activities to further these objectives, which may increase some negative effects on biological resources in the action area. The proposed sanctuary designation may also attract more public users to the area, resulting in increased boat traffic.

Beneficial Impacts on Biological Resources

Implementing Alternative 1 would benefit biological resources in the action area by reducing the potential for disturbance of the lakebed and shorelines through proposed regulatory provisions for underwater cultural and historical resources.

Any disturbance of underwater cultural and historical resources not only jeopardizes the preservation of these resources but could also disturb associated habitat for aquatic biota. Regulations that prohibit moving, removing, recovering, or otherwise injuring underwater cultural and historical resources, such as shipwrecks, would therefore indirectly protect biological habitat for aquatic organisms. Disturbance of underwater cultural and historical resources could stir up sediments and cause localized declines in water quality. Similarly, benthic habitat would be indirectly protected because recreational vessel operators would be required to use mooring buoys in place of anchoring on the lakebed. The use of mooring buoys would protect benthic habitat by providing boaters an option to remain near shipwrecks without damaging habitat by dropping anchors or stirring up sediments that could result in a localized decline in water quality. Education and outreach efforts promoting best practices for accessing shipwreck sites would also protect associated biological resources from damage, disturbance, and water quality degradation.

Overall, NOAA determined that the **beneficial impacts** on biological resources from implementing Alternative 1 would be **negligible** due to the small area of lakebed or shorelines that would be protected from disturbance by proposed regulatory provisions for underwater cultural and historical resources.

Adverse Impacts on Biological Resources

Implementing Alternative 1 has the potential for the following minor impacts on biological resources in the action area from increased site visitation:

- Temporary displacement or disturbance of fish, birds, and other wildlife
- Minor direct disturbance of benthic habitat and shorelines in small areas
- Localized decline in water quality
- Potential for exacerbating the spread of invasive species

Temporary Displacement or Disturbance of Fish, Birds, and Other Wildlife

Under Alternative 1, when vessels transit within the proposed sanctuary, minor acoustic disturbance from engine noise could impact fish, birds, or other wildlife in the area of vessel activity. Scuba divers visiting shipwreck sites, whether recreational or for management or research purposes, may also disturb and displace fish, birds, or other wildlife through their physical movements or noise. If any species were to be within close enough proximity to a NOAA authorized vessel, recreational boater, or scuba divers, the interaction could result in a response ranging from no reaction to a startled reaction that leads to a rapid fleeing from the area. In such cases, these organisms would be able to move to nearby suitable habitats. For sonar surveys, sound detection by the majority of freshwater fishes, and hence behavioral disturbance and hearing impairment, is unlikely to occur due to the much higher frequencies of these instruments relative to fish hearing capabilities. Most fish are sensitive to sounds as high as 1 kHz (Wahlberg and Westerberg, 2005). However, NOAA does not anticipate that sanctuary management activities would require the use of echo sounders operating at frequencies lower than 200 kHz. Therefore, no acoustic impacts to these species are expected.

Fish usually avoid human activity. As a result, the most likely effect on fish from interactions with vessels, scuba divers, or sonar equipment would be a moderate to high energy avoidance behavior resulting in the animal temporarily leaving the immediate area unharmed. This disturbance would be brief and is not likely to significantly impact the organism's ability to feed, reproduce, or avoid predators. Species occurring near popular docks or shipwrecks would likely be familiar with the current levels of recreational diving that occurs. Therefore, these activities would be unlikely to cause species to avoid or abandon habitat within the proposed sanctuary.

Disturbance from vessel activities would be minimized because of the low level of NOAA-authorized vessel trips likely to occur within a year, and the relatively short duration of each trip. Disturbance from research activities such as diving would be minimized because staff are highly trained and would follow NOAA best management practices to protect biological resources and to avoid, or minimize, disturbing species.

NOAA determined that any disturbance of fish, birds, or other wildlife associated with sanctuary management activities would be minor and temporary and would not result in any harm or injury to individuals or populations. This action would not result in the take of any protected species, including New York state-listed Endangered, Threatened and species of Special Concern (see Appendix B.4 for full species list).

Minor Direct Disturbance of Benthic Habitat and Shorelines in Small Areas

Under Alternative 1, NOAA would implement management activities to protect underwater cultural and historical resources, such as installing and maintaining mooring buoys and other equipment on the lakebed, which could result in direct, localized disturbances to the lakebed. Installation of a mooring system requires placing a steel block (typically a train wheel) on the lakebed. This activity could very minimally change the structural properties of the lakebed. However, adverse impacts from installation and maintenance of mooring buoys and lake floor equipment would be negligible due to the very small amount of area that would be directly disturbed (less than 21 square feet). NOAA would implement best management practices, such

as selecting sites that avoid important lake floor structures, in order to minimize adverse impacts to the lakebed.

Under Alternative 1, anticipated increased visitor vessel use and anchoring near shore to visit shipwreck locations could cause increased damage to shoreline trees and other plants and erosion to soils and exposed rocks, which may also cause localized water quality degradation. There are only a few areas of shoreline with shipwreck sites nearby that would be affected. These effects could be avoided by implementing future mooring installations and promoting responsible access to shipwrecks for diving and vessels. Proportionally, there are more shipwreck sites near shore in the St. Lawrence River area than in eastern Lake Ontario, so shoreline biological effects from dive site access and mitigating effects from sanctuary management activities may also be greater there.

Localized, Temporary Decline in Water Quality

Under Alternative 1, installation and maintenance of mooring buoys and vessel operations could result in a localized, temporary degradation of water quality and pelagic habitat. Turbidity could temporarily increase during the installation and maintenance of mooring buoys when NOAA may use drills or other tools and equipment to anchor equipment to the lakebed. Vessel operations could result in minimal adverse impacts to water quality due to the small potential for a localized decline in water quality from unintended pollution spills from sanctuary vessels. NOAA must comply with relevant federal statutes, NOAA Small Boat Program guidelines, and NOAA ONMS vessel best management practices and standing orders to minimize the likelihood of a spill and limit the impacts if a spill were to occur. Any localized decline in water quality associated with placement of equipment on the lakebed would dissipate quickly because the extent of disturbance to the lakebed would be very small.

Potential for Exacerbating the Spread of Invasive Species

Under Alternative 1, there could be an increased risk of introducing and spreading invasive species due to the increased number of recreational vessels and NOAA vessels visiting the sanctuary. However, New York state has several programs in place to address the spread of invasive species, including regulations (NYSDEC, n.d.-a) and published best practices for boaters to mitigate their chances of contributing to the problem. NYSDEC's best practices include using available boat wash stations and draining and cleaning vessels before using them at another location (NYSDEC n.d.-c). NOAA vessels also follow best management practices to eliminate the potential spread of invasive species, as well as minimize impact to the marine environment and marine species.

Summary of Adverse Impacts on Biological Resources

Overall, NOAA determined that **adverse impacts** on biological resources from implementing Alternative 1 would be **negligible** due to best management practices NOAA would follow during research and other field activities; the small level of field activities NOAA would implement compared to existing vessel activities occurring in the action area; the regulations and best management practices that both the state of New York and NOAA have in place to mitigate the spread of invasive species; and in the event of disturbance, organisms could move to adequate suitable habitat nearby.

5.3.4.1 Effect Determination for Endangered Species Act Listed Species and Designated Critical Habitat (Alternative 1)

As noted in Section 4.5.1.4, NOAA determined that four species listed as Endangered or Threatened under the ESA under USFWS jurisdiction could occur in the action area: Indiana bat (*Myotis sodalis*), northern long-eared bat (*Myotis septentrionalis*), piping plover (*Charadrius melodus*), and bog turtle (*Glyptemys muhlenbergii*). In addition, designated critical habitat for the piping plover occurs within the action area. No proposed or candidate species or proposed designated critical habitat occur within the action area. NOAA analyzed the potential impacts of implementing Alternative 1 on these four listed species and designated critical habitat for the piping plover, as discussed below.

The piping plover may infrequently occur within the action area during the limited portions of the year that they breed, forage, or migrate through Lake Ontario. NOAA determined that implementing Alternative 1 would result in **no effect** to these four listed species for the following reasons:

- Low intensity of activities that would occur within the sanctuary, especially along the shoreline where these species would be most likely to occur (e.g., the piping plover)
- Short duration and rarely observed nesting period and infrequent observations of piping plovers along the shoreline within the action area
- Potential habitat for the Indiana bat, northern long-eared bat, and bog turtle does not exist near shorelines where they may be disturbed by sanctuary activities
- Types of management activities that would occur in the proposed sanctuary would not be disruptive to roosting bats (R. Niver, personal communication, April 7, 2020)

As noted in Section 4.5.4.1, designated critical habitat for the piping plover occurs along sandy beaches adjacent to the proposed sanctuary. Field activities to implement the proposed sanctuary management plan would primarily occur within buildings or on the water and would not include any ground disturbing activities within the designated critical habitat unit (66 FR 22938). Therefore, NOAA determined that implementing Alternative 1 would have no effect on designated critical habitat for the piping plover because it would not result in a direct or indirect alteration in any of the essential features of designated critical habitat that would appreciably diminish the value of critical habitat for both the survival and recovery of the piping plover.

Table 5.1. Effect Determination for Endangered Species Act Listed Species under USFWS Jurisdiction Potentially Found in the Action Area

Species Common Name	Species Name	Status	Effect of NOAA's Proposed Action
Northern long-eared bat	<i>Myotis septentrionalis</i>	Threatened	No effect
Indiana bat	<i>Myotis sodalis</i>	Endangered	No effect
Piping plover	<i>Charadrius melodus</i>	Endangered	No effect
Bog turtle	<i>Glyptemys muhlenbergii</i>	Endangered	No effect

5.3.4.2 Effect Determination for Migratory Birds (Alternative 1)

Section 4.5.4.2 describes the 22 bird species protected under the MBTA that may be found transiting, resting, or foraging within the sanctuary (Appendix B.3). The MBTA prohibits pursuing, hunting, taking, capturing, or killing migratory birds, their nests, or their eggs.

Consistent with the analysis of impacts to biological resources in Section 5.3.4 above, NOAA determined that any impacts to migratory birds from implementing Alternative 1 would be **negligible and incidental**, such as minor disturbances from vessel traffic, noise from recreational activities in the proposed sanctuary, or from other sanctuary management activities. NOAA determined that any minor disturbance of migratory birds associated with implementing Alternative 1 would have negligible impacts and would **not result in the take** of migratory birds protected under the MBTA.

5.4 Impacts of Alternative 2: Preferred Alternative

This section describes the beneficial and adverse impacts from implementing Alternative 2. Alternative 2 includes only eastern Lake Ontario. The major differences between Alternative 1 and Alternative 2 are:

- Under Alternative 2, the sanctuary boundary would be smaller and NOAA would protect and manage 41 known shipwrecks and one known aircraft (versus 62 shipwrecks and one known aircraft in Alternative 1). In addition, the archaeological sites in the St. Lawrence River would not be protected or managed by NOAA.

Under Alternative 2, the proposed regulations and management plan for the proposed sanctuary would be the same as Alternative 1. Implementing Alternative 2 would generally have the same beneficial and adverse impacts on the underwater cultural and historical resources, socioeconomic resources and human uses, and physical and biological resources as described in Alternative 1, except they would occur over a smaller geographic area (see Section 5.3). Impacts to each of these resource areas that are specific to Alternative 2 are described below.

5.4.1 Impacts on Underwater Cultural and Historical Resources (Alternative 2: Preferred Alternative)

Under Alternative 2, NOAA would focus research and monitoring activities on fewer underwater cultural and historical resources, which would reduce the amount of new archaeological information available for the research community and the public. Alternative 2 would represent a smaller number of shipwreck sites within recreational and technical diving limits.

Nonetheless, both action alternatives would protect a substantial number of nationally significant shipwrecks. While Alternative 2 would not protect as many historical and cultural resources as Alternative 1, NOAA determined that the **beneficial impacts** on underwater cultural and historical resources from implementing Alternative 2 would be **significant** due to the direct and permanent protections to these historically significant resources that would be provided by implementing regulations to prohibit harm or injury to shipwrecks, research and monitoring activities to inform long-term management, and enhanced stewardship through outreach initiatives.

5.4.2 Impacts on Socioeconomic Resources and Human Uses (Alternative 2: Preferred Alternative)

Implementing Alternative 2 would have the same types of beneficial impacts on socioeconomic resources and human uses in the study area as described in Section 5.3.1 under Alternative 1, but to a lesser extent because the Thousand Islands region of the St. Lawrence River would not be part of the sanctuary. For example, NOAA anticipates that Alternative 2 may not draw as many divers as Alternative 1 due to there being fewer diveable shipwrecks within recreational scuba diving depth limits, its smaller geographic extent, and a narrower scope of interpretive and outreach opportunities for NOAA and its partner museums. Alternative 2 would include a smaller concentration of accessible shipwrecks afforded greater visibility, protection, and promotion as a national marine sanctuary for the dive community than Alternative 1, and it does not include the Thousand Islands region. Therefore, water-based tourism, specifically the dive industry, would see fewer benefits under Alternative 2 than Alternative 1.

Nonetheless, as described in Section 5.3.2, the national visibility of a national marine sanctuary under Alternative 2 would likely attract more tourists to the sanctuary and local region and result in **negligible beneficial impacts** in the short run and **moderate beneficial impacts** in the long run to human uses and socioeconomic resources in the study area. These benefits would be driven primarily by anticipated use benefits from land-based tourism, which is expected to be similar across the two alternatives. Further, it is expected that the sanctuary designation would have positive impacts on human uses, but given an absence of baseline data, NOAA is unable to state the impacts would be significant with certainty.

Similar to Alternative 1, implementing Alternative 2 would have **no effect** on military activities because they would not be impacted by the proposed sanctuary regulations. The proposed sanctuary designation would likely have **no impact** on energy generation or transmission because the proposed sanctuary regulations would not limit responsibly sited development. Education and public outreach would foster greater awareness of sanctuary resources and lead to impact avoidance during project planning for energy development projects. In addition,

energy generation and transmission projects are typically subject to rigorous federal and state review to minimize impacts to historic resources and are therefore unlikely to directly affect sanctuary resources. In contrast to Alternative 1, Alternative 2 would have no effect on commercial shipping, as the St. Lawrence River would not be included. Therefore, neither potential impacts to navigation nor user conflicts in the river would occur.

5.4.3 Impacts on Physical Resources (Alternative 2: Preferred Alternative)

Under Alternative 2, NOAA anticipates that the type and intensity of activities that affect physical resources would be the same as Alternative 1 but would occur over a smaller geographic area. Proportionally, there are more shipwreck sites near shore in the St. Lawrence River area than eastern Lake Ontario, so shoreline physical effects from dive site access and effects from sanctuary management activities may be smaller under Alternative 2, as those nearshore sites in the St. Lawrence River would not be included.

5.4.4 Impacts on Biological Resources (Alternative 2: Preferred Alternative)

Under Alternative 2, NOAA anticipates that the type and intensity of activities that affect biological resources would be the same as Alternative 1 but would occur over a smaller geographic area. Proportionally, there are more shipwreck sites near shore in the St. Lawrence River area than eastern Lake Ontario, so shoreline biological effects from dive site access and mitigating effects from sanctuary management activities may be smaller under Alternative 2, as those nearshore sites in the St. Lawrence River would not be included.

5.4.4.1 Effect Determination for Endangered Species Act Listed Species and Designated Critical Habitat (Alternative 2)

As described in Section 4.5.1.4.1, four species listed as Threatened or Endangered under the ESA under USFWS jurisdiction could occur in the action area. Based on the similar activities and action area among both action alternatives, NOAA determined that implementing Alternative 2 would result in **no effect** to these four listed species and designated critical habitat for the piping plover. See Section 5.3.4.1.

5.4.4.2 Effect Determination for Migratory Birds (Alternative 2)

Based on the similar activities and action area among both action alternatives, NOAA determined that any impacts to migratory birds from implementing Alternative 2 would be **negligible and incidental**, NOAA determined and that implementing Alternative 2 would result in **no take** of migratory bird species protected under the MBTA (see Appendix B.3).

5.5 Cumulative Impacts

The CEQ regulations for implementing the provisions of NEPA define cumulative impacts as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR 1508.7

(1978)). The regulations further define cumulative impacts as those that can result from individually minor but collectively significant actions that take place over a period of time. The CEQ guidance for considering cumulative effects states that NEPA documents “should compare the cumulative effects of multiple actions with appropriate national, regional, state, or community goals to determine whether the total effect is significant” (CEQ, 1997).

This section presents the methods used to evaluate cumulative impacts, lists projects that may contribute to cumulative effects when combined with the impacts of the proposed action or alternatives discussed in this EIS, and describes the potential cumulative impacts of the proposed action.

5.5.1 Cumulative Impact Assessment Methods

CEQ’s cumulative effects guidance identifies several different methods for assessment of cumulative impacts, such as checklists, modeling, forecasting, and economic impact assessment, where changes in employment, income, and population are evaluated.³⁰ In general, past, present, and future foreseeable projects are assessed by topic area. Cumulative effects may arise from single or multiple actions and may result in additive or interactive effects. Interactive effects may be countervailing, where the adverse cumulative effect is less than the sum of the individual effects, or synergistic, where the net adverse effect is greater than the sum of the individual effects.³¹ For the purposes of this analysis, NOAA considered cumulative effects to be significant if they exceed the capacity of a resource to sustain itself and remain productive. The geographic scope and time frame for the cumulative effects analysis are the boundaries of the proposed sanctuary under each action alternative, shorelines immediately adjacent to the proposed sanctuary boundaries, and five years prior to the publication of the draft EIS to 10 years after designation for implementation of the proposed sanctuary regulations and management plan.

The projects in Table 5.2 are currently occurring or are anticipated to occur in the reasonably foreseeable future within the study area and the analyzed time frame (10 years). NOAA considered the effects of these actions in combination with the impacts of the proposed action to determine the overall cumulative impact on the resources described in Chapter 4.

5.5.2 Past, Present, and Reasonably Foreseeable Future Projects

Table 5.2 lists the other federal and non-federal actions in the study area that could contribute to cumulative impacts. This list was compiled based on NOAA staff knowledge of other existing or planned activities occurring in and around the proposed sanctuary. Some of the activities listed in Table 5.2 are generally similar in scope and type to the proposed action. Many of these other federal and non-federal actions relate to management and research of shoreline habitat and resources in Lake Ontario. The projects expected to contribute to cumulative impacts are likely to have similar types of impacts on the resources within the study area, would affect similar resources to those that are affected by the proposed action, or are large enough to have far-reaching effects on a resource.

³⁰ CEQ, 1997

³¹ CEQ, 1997

Table 5.2. Other federal and non-federal actions with potential to contribute to cumulative impacts.

Project Title	Location	Project Lead	Project description	Estimated Completion Timeline
Fort Ontario proposal as a national park	Fort Ontario Historic Site	National Park Service	Assess the feasibility of incorporating Fort Ontario and the Safe Haven Holocaust Refugee Shelter Museum as a unit of the National Park Service	2–3 years
State Park Management	State parks bordering Lake Ontario in Cayuga, Wayne, Oswego, Jefferson, Monroe, Onondaga, and Ontario counties	New York State Parks, Recreation, and Historic Preservation	Parks management	Ongoing
Critical Environmental Area management	Sandy Pond	New York State Department of Environmental Conservation	Natural area management	Ongoing
Tourism related to the Great Lakes Seaway Trail	518-mile driving route starting in Pennsylvania and ending in Rooseveltown, New York; runs along the eastern shore of Lake Ontario and the St. Lawrence River in the proposed action area	Great Lakes Seaway Trail Inc. and U.S. Department of Transportation	Driving route with markers for notable sightseeing spots	Ongoing
St. Lawrence Seaway management	St. Lawrence River in New York	St. Lawrence Seaway Development Corporation (U.S. Department of Transportation (U.S. DOT))	Regulate commerce and navigation on the Seaway	Ongoing
Dredging and maintenance of shorelines and harbors	Lake Ontario and St. Lawrence River in New York	U.S. Army Corps of Engineers (USACE) and New York State (NYS)	Construction, dredging, and maintenance activities for harbors and shorelines	Ongoing

Project Title	Location	Project Lead	Project description	Estimated Completion Timeline
Operation of museums, visitor centers, and historical societies	Antique Boat Museum, Erie Canal Museum, H. Lee White Maritime Museum, Williamson-Pultneyville Historical Society, Starr Clark Tin Shop, and Boldt Castle	Nonprofit organization	Heritage interpretation/tourism	Ongoing
Tourism of historic lighthouses	Tibbetts Point Lighthouse, Charlotte-Genesee Lighthouse, Oswego West Pierhead Lighthouse, and Sodus Bay Lighthouse Museum	Managed by historical societies	Heritage interpretation/tourism and parks management	Ongoing
Fisheries management	Rivers and Lake Ontario	NYSDEC, USGS	Fisheries management, hatcheries/stocking, and regulations	Ongoing
Watercraft regulations	Rivers and Lake Ontario	NYSDEC and U.S. Coast Guard	Watercraft regulations	Ongoing
Waterfront development/coastal management	Rochester, Fair Haven, Sodus Point, Oswego, Sackets Harbor, Cape Vincent, Clayton, Fisher Landing, Swan Bay, and Alexandria Bay	New York coastal local management (Local Waterfront Revitalization Plans), New York State Coastal Management Program	Continued growth and development in waterfront communities	Ongoing
Cultural resources, New York state regulations	Coastal New York, Lake Ontario, and St. Lawrence River	New York State Parks, Recreation and Historic Preservation, NYSDEC, and New York State Museum	Cultural resource protection	Ongoing

Project Title	Location	Project Lead	Project description	Estimated Completion Timeline
Indigenous governance	Lake Ontario, St. Lawrence River, and Salmon River	Cayuga Nation, Oneida Nation, Onondaga Nation, Seneca Nation of Indians, St. Regis Mohawk Tribe, Tuscarora Nation, and Tonawanda Seneca Nation	Governance	Ongoing
Marine transportation infrastructure management	Lake Ontario and St. Lawrence River	USCG, NYS, Port of Oswego Authority, St. Lawrence Seaway Development Corporation, (U.S. DOT), and USACE Buffalo District	Navigational and vessel regulations, transportation infrastructure management, dredging	Ongoing
Water level and water quantity management	Lake Ontario and St. Lawrence River watersheds	International Joint Commission, NYSDEC, and USGS	Water level and quantity management	Ongoing
Power stations	Nine Mile Point Nuclear Plant, R.E. Ginna Nuclear Power Plant, Fitzpatrick Nuclear Power Plant, and over 51 other power stations within 20 miles of the coastline along the study area ¹	New York state, counties, utilities, and federal agencies	Power plant operations	Ongoing
NYSDEC State Pollutant Discharge Elimination System (SPDES) Permit Program	New York power and utilities and five wastewater sites on St. Lawrence and 21 on Lake Ontario	NYSDEC and International Joint Commission	Multiple permits for many types of waste discharges with low pollutant content and with no likely adverse effect on water quality, including industrial production, stormwater, power generation, and wastewater treatment facilities	Ongoing

Project Title	Location	Project Lead	Project description	Estimated Completion Timeline
Great Lakes federal agency research	Throughout Great Lakes	NOAA, USGS, partner universities, municipalities, state, federal, international agencies, non-governmental institutions, etc.	Regional environmental research	Ongoing
Potential offshore wind development	Lake Ontario	Private developers	No active proposals	N/A
Submerged cable replacement	Eastern Lake Ontario and St. Lawrence River	Varies, typically private landowners or utilities	Electric transmission cables connecting islands to the mainland	Ongoing
Local or state tourism boards/agencies		New York state and local governments	Advertising for the local area or state to attract tourists	Ongoing
Dive shops/operators	Lake Ontario, Thousand Islands region, and regional dive shops	Small businesses	Advertising and marketing to attract new clients to the region	Ongoing

¹Source: [U.S. Bureau of Ocean Energy Management & National Oceanic and Atmospheric Administration](#) and [U.S. Energy Information Administration](#)

As the proposed action for the designation of Lake Ontario National Marine Sanctuary is a regulatory and management action rather than a specific development action, the cumulative effects described below are related primarily to local and regional management of underwater cultural and historical resources in the study area. For the purposes of this cumulative effects analysis, NOAA assumed that any of the actions in Table 5.2 that have not already been implemented would be approved and implemented within the time period for this analysis.

As described in detail in the subsections below, NOAA found that the combination of implementation of the alternatives with the actions in Table 5.2 would result in cumulative beneficial impacts to underwater cultural and historical resources and human uses and socioeconomic resources in the study area. The proposed action's contribution to any adverse cumulative effects to these resources would be **negligible**, due to the implementation of best management practices and mitigation measures to minimize or avoid any adverse impacts.

5.5.3 Cumulative Impacts on Underwater Cultural and Historical Resources

The proposed action would not significantly contribute to any adverse impacts from other actions on underwater cultural and historical resources. Cumulative effects that could impact underwater cultural and historical resources may include disturbance and physical impacts from increased visitation to historic shipwrecks resulting from public use and management activities.

However, NOAA would mitigate the intensity of these human use effects through public outreach and regulatory prohibitions, which would lower the risk of damage to the sanctuary's shipwrecks. Further cumulative impacts to underwater cultural and historical resources includes potential destruction of underwater cultural and historical resources and sites from dredging and construction activities, including shoreline maintenance, dock and harbor infrastructure, and waterfront revitalization projects. These impacts would be mitigated through compliance with the proposed sanctuary regulations, collaboration with New York state officials, and compliance with the NHPA for any potential impacts to historic properties.

5.5.4 Cumulative Impacts on Human Uses and Socioeconomic Resources

Table 5.2 includes several local and state parks and maritime museums that conduct similar activities as the proposed sanctuary and also draw visitors to the coastal communities in the study area. These sites' efforts to attract tourism, in conjunction with efforts to attract tourists to the proposed sanctuary, would have overlapping beneficial impacts on the tourism industry in the coastal communities next to the proposed sanctuary. Designating the proposed Lake Ontario National Marine Sanctuary would add a major water-based attraction to the region that would encourage both land-based tourism (e.g., visitor centers and museums) and water-based tourism (e.g., scuba diving, recreational boating).

Increased tourism from these other activities could also increase the number of recreational users within the proposed sanctuary, potentially resulting in densely used local areas. As part of the management plan review process, NOAA would regularly review the sanctuary's management plan and regulations and make revisions as necessary to respond to changing threats to sanctuary resources. Thus, although the actions listed in Table 5.2 would have positive, beneficial impacts, the proposed action can be estimated with high confidence, to at a minimum, have **negligible, beneficial cumulative impacts** on human uses or socioeconomic resources in the proposed sanctuary. Baseline monitoring and future monitoring of the proposed area would help to determine if the actual impacts from designation rise to the level of significant impacts.

5.5.5 Cumulative Impacts on Biological and Physical Resources

The proposed action would not significantly contribute to any adverse impacts on habitats, wildlife, protected species, climate, air, or water from other actions. NOAA's implementation of the proposed action is expected to result in minor increases in public use and management activities occurring within the study area. These activities may cause minor local adverse cumulative effects on biological and physical resources. However, these minor adverse impacts would be mitigated by NOAA's implementation of best management practices and other regulatory and management activities that would protect lakebed habitats and substrate near shipwreck sites from physical disturbance.

Several other organizations, including federal, state, and local government entities, are involved in the protection of biological and physical resources in the Great Lakes. These organizations conduct research activities and regulate activities occurring in this region (see Table 5.2). Threats to aquatic and physical resources from other activities within the proposed sanctuary

include the negative effects of invasive species, climate change, and pollution from point and nonpoint sources. Over many decades, the cumulative effects of chemical contamination, nutrient pollution that results in eutrophication and low dissolved oxygen levels, and invasive species destabilized the Great Lakes aquatic ecosystem. Lake Ontario and the St. Lawrence River have undergone cycles of degradation and remediation, and these watershed effects affect the aquatic resources within the proposed sanctuary. Continued releases of nutrients, particularly from nonpoint sources; continued persistence of invasive species; and continued changes in air temperature, water temperature, and precipitation due to climate change will prevent a stable natural environment over the next decade. While the proposed sanctuary would not directly protect biological or physical resources, the adverse impacts from field activities would be negligible, and therefore, would not significantly contribute to cumulative impacts on physical and biological resources.

5.6 Summary of Environmental Consequences Analysis

This section briefly summarizes the environmental consequences analysis and compares the anticipated impacts of all of the alternatives.

Table 5.3 shows the color codes used in Table 5.4. Table 5.4 provides a brief summary and comparison of the impacts on each resource area expected to occur under each of the action alternatives described in this chapter.

Table 5.3. Color coding legend for Table 5.4.

Negligible beneficial impact
Moderate beneficial impact
Significant beneficial impact
Negligible adverse impact
Moderate adverse impact
Significant adverse impact

Table 5.4. Summary of the environmental consequences for all three of the alternatives.

Resource Type	Alternative	Quality of Impact	Significance of Impact	Type of Impact
Cultural and Historical Resources	No Action	None	--	--
	Alternative 1	Beneficial	Significant	Direct
		Adverse	Negligible	Direct
	Alternative 2 (Preferred)	Beneficial	Significant	Direct
		Adverse	Negligible	Direct
Socioeconomic Resources and Human Uses	No Action	None	--	--
	Alternative 1	Beneficial	-Short-term impacts: negligible -Long-term impacts: moderate	Direct
		Adverse	Negligible (no impacts to military activities or energy generation/transmission)	Indirect
	Alternative 2 (Preferred)	Beneficial	-Short-term impacts: negligible -Long-term impacts: moderate	Direct
		Adverse	None (no impact to military activities, energy generation or transmission, or commercial shipping)	--
Physical Resources	No Action	None	--	--
	Alternative 1	Beneficial	Negligible	Indirect
		Adverse	Negligible	Direct and indirect
	Alternative 2 (Preferred)	Beneficial	Negligible	Indirect
		Adverse	Negligible	Direct and indirect

Resource Type	Alternative	Quality of Impact	Significance of Impact	Type of Impact
Biological Resources	No Action	None	--	--
	Alternative 1	Beneficial	Negligible	Indirect
		Adverse	Negligible	Direct
	Alternative 2 (Preferred)	Beneficial	Negligible	Indirect
		Adverse	Negligible	Direct
Endangered Species Act Listed Species	No Action	None	--	--
	Alternative 1	None	--	--
	Alternative 2 (Preferred)	None	--	--
Migratory Bird Treaty Act Species	No Action	None; No take of migratory birds	--	--
	Alternative 1	Negligible and Incidental; No take of migratory birds		
	Alternative 2 (Preferred)	Negligible and Incidental; No take of migratory birds		

5.7 Comparison of Impacts of the Alternatives

Under the No Action Alternative, NOAA would not designate a national marine sanctuary in eastern Lake Ontario. Under Alternative 1, the proposed sanctuary would cover 1,786 square miles and protect and manage 62 known shipwrecks and one known aircraft (as well as 20 reported historic vessels and three aircraft losses). Under Alternative 2, the sanctuary boundary would be smaller, and NOAA would protect and manage 41 known shipwrecks and one known aircraft (as well as 19 reported historic vessels and three aircraft losses).

NOAA's analysis finds that implementing either alternative 1 or 2 would have **significant** beneficial impacts on underwater cultural and historical resources due to the direct and permanent protections to these historically significant resources that would be provided by implementing regulations to prohibit harm or injury to shipwrecks, conducting research and monitoring activities to inform long-term management, and enhancing stewardship through outreach initiatives. While Alternative 2 would not protect as many historical and cultural resources (41 known shipwrecks, one known aircraft, 19 potential shipwrecks, and three potential aircraft) as Alternative 1 (62 known shipwrecks, one known aircraft, 19 potential

shipwrecks, and three potential aircraft), both action alternatives would protect a substantial number of nationally significant shipwrecks. Under Alternative 2, the beneficial impacts on underwater cultural and historical resources would be smaller than under Alternative 1 because NOAA would focus research and monitoring activities on fewer underwater cultural and historical resources. Research on fewer sites would mean a smaller amount of new archaeological information available for the research community and the public compared to Alternative 1, a smaller number of shipwreck sites within recreational and technical diving limits, and a narrower scope of interpretive activities due to the smaller geographic scope of the proposed sanctuary.

Implementing either Alternative 1 or Alternative 2 would bring resources and national visibility to provide coordinated promotion of regional recreational activities and human uses within the designated sanctuary area, compared to the No Action alternative. Specific benefits expected under either action alternative would include:

- Increased maritime heritage tourism and improved recreational experiences
- Transfers and positive economic contributions from increased recreational and tourism spending in the local economy
- Increased non-market value from sanctuary designation
- Reduced entanglement of fishing gear and related costs to commercial and recreational fishing
- Increased investment from research activities

NOAA's analysis finds that the beneficial impacts to socioeconomic resources and human uses would be greater under Alternative 1 because the proposed sanctuary would cover a larger geographic area.

Under either action alternative, the proposed regulations and management plan objectives would protect underwater cultural and historical resources in the proposed sanctuary. Implementing proposed regulatory provisions to protect underwater cultural and historical resources from disturbance could have minor benefits to physical and biological resources in the action area by reducing the potential for disturbance of the lakebed, shorelines, and any living resources in these areas.

NOAA's analysis finds that implementing the action alternatives would not result in any significant adverse impacts to the human environment. However, designating the proposed sanctuary under Alternative 1 or Alternative 2 could have minor adverse impacts on some resource areas due to increased levels of site visitation associated with increased name recognition of the area through national marine sanctuary designation. The proposed sanctuary designation may also attract more public users to the area, resulting in increased boat traffic. NOAA-led activities to support management of the proposed sanctuary as well as recreational activities, such as vessel operations and maintenance; scuba operations; deployment of AUVs, ROVs, gliders, and drifters; archaeological site investigation; and deployment of equipment on the lakebed (i.e., installing mooring buoys) could cause minor disturbance of underwater cultural and historical resources, the lakebed, and any fish species present in the area. NOAA's analysis finds that any adverse impacts on these resources from implementing Alternative 1 or Alternative 2 would be negligible or minor due to best management practices NOAA would

follow during research and other field activities; the mooring program that would limit direct interactions with shipwrecks by recreational divers; regulations to prohibit harm or injury to shipwrecks; and outreach programs that would encourage public stewardship.

Overall, NOAA's analysis finds that implementing either Alternative 1 or Alternative 2 would generally have the same types of beneficial and adverse impacts on the underwater cultural and historical resources, socioeconomic resources and human uses, and physical and biological resources. Under Alternative 2, these impacts would occur over a smaller geographic area and would be smaller in scope and intensity because fewer underwater cultural and historical resources would be protected under sanctuary regulations. When compared to the either action alternative, NOAA finds that implementing the No Action Alternative would forgo the benefit of implementing regulations and a management plan to provide comprehensive, long-term management of cultural and historical resources located within the proposed sanctuary under either action alternative.

Chapter 6: Conclusions

6.1 Unavoidable Adverse Impacts

Pursuant to NEPA, an EIS must describe any adverse environmental effects which cannot be avoided should the proposal be implemented (42 USC 4332). The environmental impacts of the alternatives are described in Chapter 5. NOAA's analysis found that implementing the action alternatives would not result in any unavoidable significant adverse impacts.

6.2 Relationship of Short-term and Long-term Productivity

NEPA also requires that federal agencies consider the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity (42 USC 4332). The short-term uses of the environment relating to each of the action alternatives may increase the number of visitors to the study area, while at the same time improving the health and quality of the environment by protecting the maritime cultural heritage resources that provide habitat for living resources through: (1) regulations that prohibit damaging the underwater cultural and historical resources; (2) providing a mechanism through the National Marine Sanctuaries Act to respond to hazardous spills that damage the underwater cultural and historical resources; and (3) monitoring human activities through regulations and nonregulatory programs that incorporate community involvement in the stewardship of the proposed sanctuary's underwater cultural and historical resources.

Long-term productivity derived from the action alternatives is based on the goals of the proposed sanctuary and the proposed management actions to achieve the goal of long-term protection of the underwater cultural and historical resources. These proposed actions include action plans related to resource protection, recreation and tourism, education, science and research, and infrastructure and operations. Benefits to both short-term uses and long-term productivity based on designation of the proposed Lake Ontario National Marine Sanctuary are proportional to the number of underwater cultural and historical resources that provide habitat encompassed within the area of each alternative. NOAA anticipates any growth inducing impacts from the proposed action to be negligible or moderate, and therefore would not rise to the level of significant.

6.3 Irreversible and Irretrievable Commitment of Resources

NEPA requires an analysis of the extent to which the proposed project's primary and secondary effects would commit nonrenewable resources to uses that future generations would be unable to reverse (42 USC 4332(C)(v); 40 CFR 1502.16 (1978)). The mission of a national marine sanctuary is to conserve resources for future users, but implementing routine management activities and protective regulations may require some irreversible and irretrievable commitments of resources.

Irreversible commitments of natural resources include the consumption or destruction of nonrenewable resources or degradation of renewable resources over long periods of time. The proposed action would result in the following irreversible commitments of natural resources:

- Nonrenewable resources that would be consumed during management and research activities include fuel, water, power, and other resources necessary to maintain and operate the sanctuary's research vessels and potential future sanctuary offices.
- Electricity to power sanctuary facilities would be an irreversible use of resources, if derived from a nonrenewable electrical power source (e.g., natural gas or nuclear energy).

Irretrievable commitments of resources include opportunities foregone, expenditure of funds, loss of production, and restrictions on resource use. The proposed action would result in the following irretrievable commitments of natural resources:

- Monetary funds would be expended to support management activities in the purchase of fuels, electricity, water, and other nonrenewable supplies, for wages and rents, and for potential construction of facilities
- Natural resources may be used in construction of sanctuary facilities and structures, such as buildings, signs, navigational markers, and mooring buoys
- Benthic habitat would be physically altered in the installation of mooring buoy anchors, navigational markers, and other permanently fixed informational and regulatory signs

The irreversible and irretrievable commitment of resources would be minimized and mitigated by best management practices, staff training, and sustainability goals and procedures documented in the proposed sanctuary's management plan.

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Appendix A: Management Plan for Lake Ontario National Marine Sanctuary

Section 1: Introduction

Background

The 1,722-square-mile Lake Ontario National Marine Sanctuary (LONMS) encompasses the waters and bottomlands of eastern Lake Ontario, adjacent to Wayne, Cayuga, Oswego, and Jefferson counties. The sanctuary's northern boundary lies approximately along the U.S. and Canadian border in both Lake Ontario and the entrance to the St. Lawrence River. The western sanctuary boundary is along the western border of Wayne County, and the eastern boundary is a line from approximately the international border between the U.S. and Canada near Point Alexandria, Ontario to Tibbetts Point Lighthouse. Along New York's Lake Ontario shoreline, the sanctuary boundary lies at the Low Water Datum (LWD).

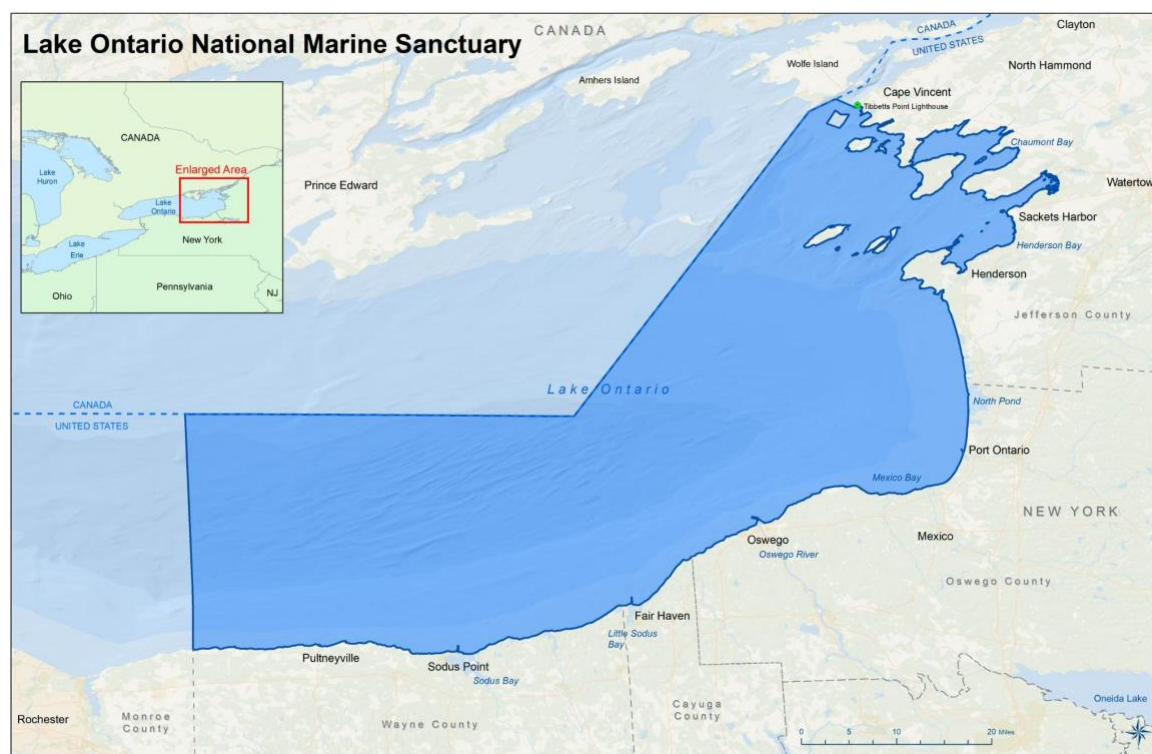


Figure A.1. Boundary of the Lake Ontario National Marine Sanctuary. Source: NOAA

LONMS highlights the national significance of the area's underwater cultural and historical resources, including 41 known shipwrecks, such as the schooner *St. Peter* which is listed on the National Register of Historic Places (NRHP). Additional underwater cultural and historical resources that may be within the boundaries include other archaeological features such as remnants of piers, aids to navigation, and historic properties and artifacts that may be of religious and cultural significance to Indigenous nations and tribes. This area may also include approximately 19 potential shipwreck sites (where shipwrecks may exist, but additional research

is needed to verify and describe these shipwrecks), three aircraft, and several other underwater archaeological sites.

The sanctuary will also facilitate broader lake conservation efforts in the region and enhance heritage tourism initiatives within the many communities that have embraced their centuries-long maritime relationship with Lake Ontario, the Great Lakes region, and the nation. Through co-management with the state of New York, the National Oceanic and Atmospheric Administration (NOAA) would work to ensure future generations can learn about and explore these underwater treasures above and beneath the waves. In partnership with local communities, NOAA would provide a national stage for promoting heritage tourism and recreation to connect more Americans with this special place.

Establishing a national marine sanctuary in New York waters will complement and expand existing state-led preservation efforts, research programs, local initiatives, and public outreach initiatives. The state of New York, through the State Education Law and the New York Historic Preservation Act of 1980, inventories, documents, and interprets the state's underwater cultural heritage. A sanctuary designation will enhance these efforts and add further protections due to its comprehensive research, resource protection, and education programs. The presence of a sanctuary will also provide access to NOAA's extended network of scientific expertise, partners, and technological resources, enhance ongoing research, and provide an umbrella for the coordination of these activities. A sanctuary will support and build on the educational initiatives in place and provide exciting programming that would reach grades K–12 and university students, as well as the general public, across the state. A sanctuary designation, the local commitment to the sanctuary, the existing state agency interest, and NOAA's existing network of affiliated programs have the potential to create long lasting, impactful synergies.

In addition to the many non-regulatory actions identified in the management plan action plans such as research and monitoring, education and outreach, and tourism and economic development, NOAA promulgated the following regulations to complement existing state laws and to manage the sanctuary's resources.

- Moving, removing, recovering, altering, destroying, possessing, or otherwise injuring, or attempting to move, remove, recover, alter, destroy, possess, or otherwise injure a sanctuary resource;
- Possessing, selling, offering for sale, purchasing, importing, exporting, exchanging, delivering, carrying, transporting, or shipping by any means any sanctuary resource within or outside of the sanctuary;
- Grappling into or anchoring on shipwreck sites (delayed implementation of two years following sanctuary designation);
- Deploying a tethered underwater mobile system at shipwreck sites;
- Interfering with, obstructing, delaying, or preventing an investigation, search, seizure, or disposition of seized property in connection with enforcement of the National Marine Sanctuaries Act or any regulation or any permit issued under the act with enforcement of the National Marine Sanctuaries Act or any regulation or any permit issued under the act.

These prohibitions do not apply to any activity necessary to respond to an emergency threatening life, property, or the environment; or to activities necessary for valid law enforcement purposes.

Comprehensive Management

The National Marine Sanctuaries Act (NMSA) includes direction from Congress that NOAA's Office of National Marine Sanctuaries (ONMS) will "improve the conservation, understanding, management and wise and sustainable use of marine resources" (16 U.S.C. § 1431(a)(4)(A)). The NMSA further recognizes that "while the need to control the effects of particular activities has led to enactment of resource-specific legislation, these laws cannot in all cases provide a coordinated and comprehensive approach to the conservation and management of the marine environment" (Id. § 1431(a)(3)). Accordingly, ONMS subscribes to a broad and comprehensive management approach, including interpretive enforcement, outreach, and education to meet the NMSA's primary objective of resource protection.

System-wide, comprehensive sanctuary management serves as a framework for addressing long-term protection of a wide range of living, nonliving, and marine heritage resources, while allowing multiple uses of the sanctuary to the extent that they are compatible with the primary goal of resource protection. The resources managed by ONMS span diverse geographic, administrative, political, and economic boundaries. Building and maintaining strong partnerships among resource management agencies, the scientific community, stakeholders, and the public at-large are an essential component in coordination and program integration that the NMSA calls for in order to comprehensively manage national marine sanctuaries.

About This Management Plan

Management plans are tailored to be sanctuary-specific planning and management documents. They reflect the best available science and include input from the community and government agencies to identify current and future activities, programs, and partners in order to address important issues and opportunities for the sanctuary. They provide guidance for sanctuary staff to prioritize annual work plans based on the resources and staffing allocated to them in any given year.

As part of the sanctuary designation process, NOAA created the management plan for this site with input from the [Sanctuary Advisory Council](#), state of New York, local governments, federal agencies, members of the public, and in consultation with Indigenous nations and tribes who have interest in the management and operation of the sanctuary. NOAA held three public comment periods to get input on the development of the proposed sanctuary, including the scope of the sanctuary boundaries, regulations, and management plan activities. Scoping consisted of a 105-day public period during which NOAA solicited public comments related to the scale and scope of the proposed sanctuary, including ideas presented in the sanctuary nomination (April 17 to July 31, 2019). NOAA then held a public comment period following the publication of the DEIS (July 7 to September 10, 2021). During this comment period, NOAA solicited comments on boundary alternatives, regulatory concepts, the name of the sanctuary, and the management plan. NOAA then published a notice of proposed rulemaking that identified the preferred boundary, proposed sanctuary regulations, and the terms of

designation. Together, these documents constituted NOAA's proposal to designate Lake Ontario National Marine Sanctuary, which would protect shipwrecks and related underwater cultural and historical resources that possess exceptional historic, archaeological, and recreational value.

The management plan and its action plans described below are designed to strengthen and complement existing protections and programs currently in place from state and local agencies, existing museums and science centers, and other organizations. The aspirational plan includes shared goals and activities that can be taken by NOAA or other entities or individuals that live in the area, or manage and/or enjoy the resources. The existing protections on the resources will be enhanced by the sanctuary designation.

The management plan identifies specific resource protection, research, education, and stewardship programs that will guide future sanctuary management and operations over the next five years or until the plan is updated. NOAA recognizes that it will take several years to fully integrate the sanctuary into communities, explore opportunities for partnerships, and determine more specific priorities and activities. As such, the management plan is intended to adapt over time as the sanctuary implements elements of the plan. NOAA and the state of New York will periodically revisit to identify and advance near-term priorities. NOAA, in cooperation with the Haudenosaunee Confederacy, may also develop an Indigenous engagement action plan in the future. Annual operating plans and more details about individual activities will be developed prior to implementation.

For each of the action plans, NOAA's ability to fully implement the management plan is dependent on federal funding and staffing availability over the initial five-year period. For each of these action plans, implementation would also be dependent on continued collaboration with the state of New York, as well as additional funding, grants, donations, staffing, and contributions from partners.

Management Plan Implementation Partners

NOAA's Office of National Marine Sanctuaries

NOAA's Office of National Marine Sanctuaries is the federal program within the NOAA National Ocean Service with the responsibility and legal authority to designate and manage national marine sanctuaries, including, but not limited to:

- Hiring of federal staff and associated personnel management
- Management plan implementation and revision (with state, territory, tribal and Indigenous community, and broader public input)
- Development and enforcement of sanctuary regulations
- Issuance and oversight of sanctuary permits
- Government-to-government consultation with federally recognized nations and tribes consistent with Executive Order 13175
- Periodic federal regulatory review and rulemaking for the sanctuary under the NMSA and other applicable laws
- Management of the ONMS appropriation
- Procurements made with federal funds

- Environmental compliance responsibilities that rest with NOAA/ONMS related to sanctuary actions being considered
- Adherence to National Historic Preservation Act (especially sections 106 and 110)
- Maintenance and operation of federally owned or funded office facilities, associated information technology (IT) functions, and necessary security requirements
- Vessel acquisition, ownership, and responsibility for operation and maintenance, including compliance with all NOAA safety protocols
- Establishment (under NMSA authority) of a Sanctuary Advisory Council, with seat structures, charter details, and operations to be overseen by ONMS
- Raising public awareness about the sanctuary
- Establishing partnerships to support research, monitoring, exploration, education, and outreach programs and activities

Although ONMS has many fundamental responsibilities for managing the sanctuary, many sanctuary activities will be implemented in partnership with other organizations. ONMS is committed to working closely with the state of New York, Indigenous communities, and the Sanctuary Advisory Council to prioritize the activities in the management plans and create partnerships to help implement them.

State of New York

The sanctuary will be co-managed by NOAA and the state of New York. NOAA's expertise in cultural resource management will complement the state's current historical resource protection activities and bring a comprehensive and coordinated management approach to this historic collection of nationally significant, underwater cultural and historical resources. NOAA will work with the state and other partners to conduct research and monitoring activities to fill important gaps in the archeological knowledge and historical context of these shipwrecks, enforce sanctuary regulations, enhance public appreciation of the significance of these resources, mitigate human impacts, maintain sustainable access to the resources, and encourage public stewardship of the area. NOAA will work in cooperation to implement the various activities in the sanctuary management plan with the New York State Office for Parks, Recreation, and Historic Preservation; New York State Museum; New York State Office of General Services; New York State Department of Environmental Conservation; and New York State Department of State (including the New York Coastal Management Program) in their role as trustees for state resources.

Indigenous Partners

To move forward with ONMS' commitment to building relationships and collaborating equitably with Indigenous partners, ONMS has included strategies and action plans throughout the management plan that are focused on identifying potential research priorities, conducting collaborative research, identifying historic properties and cultural landscapes, and establishing student research opportunities with Indigenous communities. ONMS will work through reciprocity and enhanced outreach efforts to foster dialogue with Indigenous communities about their priorities for managing LONMS.

Sanctuary Advisory Council

Sanctuary advisory councils are established by ONMS under the authority of section 315 of the NMSA (16 U.S.C. 1445a) to “advise and make recommendations to [NOAA] regarding the designation and management of national marine sanctuaries.” In February 2020, NOAA established a Sanctuary Advisory Council for this sanctuary to bring members of the local community together to provide advice to NOAA, to serve as a liaison with the nominating community, and to assist in guiding NOAA through the designation process. The council consists of 15 members representing the following seats: citizens-at-large, divers/dive clubs/shipwreck explorers, maritime history, education, tourism, economic development, recreational fishing, and shoreline property owners. In addition, representatives of the four counties, the city of Oswego, the U.S. Coast Guard, the Port of Oswego Authority, New York Sea Grant, and the state of New York are non-voting members. The Sanctuary Advisory Council has met on average five times per year, and helped develop the draft management plan for NOAA’s review, organized a lecture series on topics related to the sanctuary, and set up several working groups on sanctuary priorities and communications. Upon sanctuary designation, they will continue to provide advice and recommendations to the sanctuary superintendent and ONMS on issues relevant to effective implementation of the management plan, including management, science, service, and stewardship. After sanctuary designation, NOAA will renew the charter for the Sanctuary Advisory Council.

Section 2: Action Plans

The management plan for Lake Ontario National Marine Sanctuary consists of five action plans intended to guide ONMS over the coming five years. Each action plan contains strategies with specific activities to achieve the intended goal:

1. Sanctuary Operations
2. Research and Monitoring
3. Education and Outreach
4. Tourism and Economic Development
5. Resource Protection

Sanctuary Operations Action Plan

Description

The purpose of this action plan is to create sanctuary infrastructure and program support to ensure effective implementation of the management plan. Managing nationally significant resources requires appropriate facilities and vessels; trained personnel and volunteers; funding and partnerships; and specialized equipment. NOAA’s priority after designation would be to hire staff and to develop effective and sustainable infrastructure to support sanctuary priorities.

All national marine sanctuaries benefit greatly from partnerships between NOAA and nongovernmental organizations, private businesses, education and cultural institutions, community groups, private citizens, tribal governments, and local, state, and federal agencies. NOAA will develop these partnerships at LONMS to create or improve upon a number of

essential capacities, including research vessels and equipment, administrative space, law enforcement, and education and outreach programs.

Goal

Ensure sanctuary operations and administrative capabilities are sufficient to effectively, efficiently, and safely implement the sanctuary's mission.

Objectives

- Ensure necessary sanctuary infrastructure (e.g., office space, research vessels), staffing, and administration
- Ensure that sanctuary infrastructure and work policies integrate sustainability, emission reductions, and climate resilience best practices
- Create a “NOAA presence” within sanctuary communities
- Secure resources to support sanctuary operations and programs
- Enhance program support through partnerships and volunteers
- Capitalize on the sanctuary as a means for the sanctuary and its partners to apply to and secure additional funding for projects
- Create a non-profit organization to partner with the sanctuary

Strategies

STRATEGY SO-1: Identify staff and office needs to support sanctuary operations, resource protection, education and outreach, and research programs.

- **Activity SO 1.1:** Identify and fill appropriate staffing requirements at the sanctuary. The first priority will be to hire a sanctuary superintendent, who can help identify and fill other priority staffing needs.
- **Activity SO 1.2:** Provide staff with opportunities and resources for professional development and training.

STRATEGY SO-2: Develop infrastructure and a “NOAA presence” within communities that supports the sanctuary’s mission and programs.

- **Activity SO 2.1:** Conduct an infrastructure needs assessment for the sanctuary.
 - a. Gather input from local communities, the state of New York (including agencies, such as the Department of Conservation), and other stakeholders that recognizes, leverages, and complements local and statewide assets, including office and community meeting spaces.
 - b. Ensure that the study includes creating a “NOAA presence” in each community, to include infrastructure, research, education, outreach, exhibits, and engagement opportunities.
- **Activity SO 2.2:** In the development of facilities plans or other infrastructure, include consideration of facility locations and design to minimize greenhouse gas emissions and seek carbon neutrality or even aim for zero emissions to the extent possible with best practices.

STRATEGY SO-3: Maintain the Lake Ontario National Marine Sanctuary Advisory Council.

- **Activity SO 3.1:** Provide support, resources, training, and guidance to help the advisory council engage and educate the public about sanctuary management issues and ensure they are a respected voice in the community.
- **Activity SO 3.2:** Facilitate opportunities for advisory council members to connect and share information with other sanctuary advisory councils and staff throughout the National Marine Sanctuary System.

STRATEGY SO-4: Establish sanctuary volunteer programs.

- **Activity SO 4.1:** Attract, train, use, recognize, and retain volunteers and citizen scientists to support and enhance sanctuary programs, including the development of a volunteer diving program and a trained naturalist corps.
- **Activity SO 4.2:** Develop a volunteer handbook and training opportunities, consistent with national guidance, that outlines policies and opportunities for volunteers to help support the goals and purposes of the sanctuary.

Research and Monitoring Action Plan

Description

The purpose of this action plan is to outline the sanctuary's research and monitoring objectives and priorities. Sanctuary research is conducted in support of resource protection, resource management, socioeconomic uses, and education initiatives. The action plan is intended to guide the sanctuary, as well as encourage and guide archaeological and multidisciplinary research by sanctuary partners. The process of inventorying, assessing, and monitoring directly meets mandates for federal agencies under Section 110 of the National Historic Preservation Act (NHPA).

Background

Research and monitoring programs are integral to documenting, characterizing, managing, and protecting national marine sanctuary resources. Sanctuary staff will conduct, support, promote, and coordinate research with an aim toward sanctuary characterization, visitor use, and resource management. Characterization is the process through which sanctuary resources are inventoried, located, documented, analyzed, and ultimately interpreted within a broader cultural, historical, archaeological, and use context. Management is an active process involving identification of threats and disturbances to a resource and implementation of strategies that ameliorate or negate these processes. It may also include the safeguarding of sensitive historic or cultural site locations or other characteristics that may not be appropriate for public dissemination.

The ultimate goal of cultural resource management is resource preservation for both current and future generations. Knowledge acquired through research is used to evaluate existing management practices, identify emerging threats, understand visitor use patterns, and inform future management decisions. Research products will also form the foundation of outreach

materials aimed at educating the public and producing outreach materials about the importance of the Great Lakes, its past, present, and future history, and how people can sustainably use and enjoy this sanctuary.

Characterization and monitoring of sanctuary resources will continue with historical research to build on the inventory of known and potential underwater cultural and historical resources located in and around the sanctuary. Physically locating underwater cultural and historical resource sites is the next step in sanctuary characterization. Resource documentation is then conducted to provide baseline data that evaluate the current state of preservation and identify threats and disturbances present to sites, such as invasive mussels, ice and anchor damage, looting, and other intentional and unintentional human impacts. This information can then be used to develop specific management responses, including restoration, to address impacts. Finally, a monitoring program will be implemented to periodically assess resource change and implement mitigation or stabilization strategies, as well as drive research questions and inform management actions and regulatory review over time.

Goal

Protect the sanctuary resources and maritime landscape by inventorying, locating, documenting, assessing, managing, and interpreting the sanctuary's archaeological, historical, and cultural resources.

Objectives

- Characterize the sanctuary's underwater cultural and historical resources
- Study the relationship between the underwater resources, culture, and activities of the area
- Develop and encourage collaborative research programs to meet the sanctuary's ongoing management needs
- Create a monitoring program and site database to take inventory of and understand resources and threats, and feed information into system-wide databases
- Assess human use by activity within sanctuary waters
- Conduct socioeconomic research and determine visitation/visitor use in the region to inform the "value" of the sanctuary to local economies and how it relates to and affects resource protection
- Use research findings to inform sanctuary condition reports

Strategies

STRATEGY RM-1: Characterize the sanctuary's underwater cultural and historical resources and cultural landscape features.

- **Activity RM 1.1:** Conduct historical and archival research on underwater cultural resources and cultural landscape features in the sanctuary.
 - a. Continue to compile historical documentation relevant to sanctuary resources, including primary and secondary historical documents, ethnographic resources, folklore, vessel enrollment, and registration documents, court records, insurance files, and regional newspapers.

- b. Assess the condition of underwater cultural and historical resources, including human or environmental factors that influence this condition, to inform decision-making and resource protection strategies.
 - c. Maintain records and databases on known and potential shipwrecks, and other underwater cultural and historical resources, within the sanctuary.
 - d. Coordinate archival research and databases with private and public entities and individuals with an interest in studying sanctuary resources.
 - e. Complete and publish a maritime cultural landscape survey.
 - f. Coordinate and consult with Indigenous nations and communities to identify potential research priorities and identify historic properties, including cultural landscapes.
 - g. Submit National Register of Historic Places nominations; explore a National Register of Historic Places district or multiple property nomination.
- **Activity RM 1.2:** Conduct systematic archaeological surveys to locate and identify underwater cultural and historical resources, as well as landscape features in the sanctuary.
 - a. Define survey requirements for site characterization in compliance with the Federal Archaeology Program (FAP), NHPA, and ONMS guidance. Any requirements for archaeological survey or site characterization that includes removal of artifacts, should also include a plan for artifact conservation and the needs for long-term maintenance and storage of the resulting collection. This will be done in consultation with the New York State Museum.
 - b. Conduct surveys and mapping using remote sensing, divers, ROVs, multibeam sonars, and video as required. Leverage NOAA and other partners for vessel, equipment and personnel. Conduct high resolution three-dimensional (3D) scanning imagery.
 - c. Encourage and facilitate partner participation in survey work.
 - d. Disseminate research results to professional and public audiences, following guidance on the release of sensitive or proprietary information.
- **Activity RM 1.3:** Prioritize archaeological documentation of identified underwater cultural and historical resources to establish baseline data for long-term monitoring.
 - a. Determine priorities for archaeological research and documentation in collaboration with stakeholders.
 - b. Complete baseline documentation of underwater cultural and historical resources, including site plans, underwater video, still imagery, 3D side scan imagery, and photomosaics.
 - c. Partner with citizen science groups for training in monitoring initiatives.
 - d. Disseminate research results to professional and public audiences in a timely and accessible manner.

- **Activity RM 1.4:** Develop and implement a long-term monitoring plan to assess and potentially mitigate natural and human impacts on maritime heritage sites, including climate change impacts.
 - a. Collect and evaluate data about the current status and trends of the sanctuary's underwater cultural and historical resources (i.e., condition of shipwrecks and historic resources), environmental conditions (e.g., lake water quality, fishery populations, invasive species, climate change indicators), and socioeconomic information (i.e., demographics, visitor uses) to establish baseline data sets.
 - b. Establish short- and longer-term site-specific monitoring requirements for tracking and reporting on trends.
 - c. Monitor and understand threats, and as appropriate, address threats and take advantage of opportunities.
 - d. Use the data collected and analyzed in part a of this activity to develop and implement appropriate cultural and historical resource stabilization or threat mitigation measures; continue to evaluate monitoring requirements.
 - e. Make monitoring results publicly accessible and actively communicate the findings to the public.
 - f. Structure monitoring approach with trackable metrics to evaluate efficacy.
- **Activity RM 1.5:** Develop and maintain a sanctuary geographic information system (GIS).
 - a. Build and continue to enhance GIS for archaeological, historical, cultural, and geographical data management; use GIS for sanctuary resource management; and use GIS to increase data sharing among sanctuary co-managers and facilitate public dissemination of information. GIS should integrate with the state of New York's Cultural Resource Information System.
- **Activity RM 1.6:** Work with local and state governments, the Sanctuary Advisory Council, and user groups to identify and estimate the type and amount of visitor use to the sanctuary and/or nearby communities to better understand the various user groups being served, patterns of use, (e.g., cultural, commercial, recreation, science, and education), and the effects of use on the resources. NOAA will not require visitors and users to "report" sanctuary visitor use, however, it will work with its partners to estimate and track use over time.
 - a. Develop a plan and implement monitoring programs to inventory and assess baseline conditions and human use, and to track changes over time.
 - b. Work with outfitters, dive charters, recreational divers and clubs, and state partners, local businesses, and government agencies to document visitation to the sanctuary and use of the resources, and develop outreach materials that convey uses to the community.
 - c. Develop procedures for users to voluntarily report visitation to the sanctuary and use of the resources.
 - d. Explore the use of technologies (e.g., website links, social media, on-site QR codes) to facilitate monitoring and reporting of visitors and the type of uses.

STRATEGY RM-2: Study the relationship between, and context of, underwater resources and regional culture and history, including Indigenous culture and activities; describe the maritime cultural landscape and heritage of shipwrecks.

- **Activity RM 2.1:** Conduct historical and archival research on the connection between sanctuary resources and the culture and activities of the area.
 - a. Study and compile historical documentation relevant to sanctuary resources, emphasizing the relationship of cultural resources, natural resources, and local communities.
 - b. Inventory, catalog, and coordinate the compilation of existing heritage knowledge and research from private and public groups and individuals interested in partnering with sanctuary research efforts; identify and fill gaps in this knowledge; establish a central location where communities can access this research.
 - c. Evaluate connections to places like the Erie Canalway Heritage Corridor (part of the National Park System), national marine sanctuaries in the Great Lakes, and other areas that have a strong focus on maritime heritage.

STRATEGY RM-3: Develop partnerships with local, state, national, and international researchers and organizations and Indigenous nations and tribes to enhance sanctuary research programs and support broader Great Lakes conservation efforts.

- **Activity RM 3.1:** Develop partnerships that accelerate characterization of the sanctuary's underwater cultural resources using new technologies.
- **Activity RM 3.2:** Develop partnerships with multidisciplinary researchers and organizations to facilitate characterization of the sanctuary's natural environment and accelerate broader conservation efforts.
- **Activity RM 3.3:** In support of sanctuary condition reports and the National Marine Sanctuary Sentinel Site program:
 - a. Develop observation infrastructure and capabilities to have the new sanctuary serve as a National Marine Sanctuary Sentinel Site;
 - b. Facilitate, and work with others, in the study of Great Lakes ecology, including the study of climate change, invasive species, lake biology, geology, and water quality; and
 - c. Study and track the social and economic impact of the sanctuary and its resources and the services they provide to the public.
- **Activity RM 3.4:** Establish partnerships with local educational institutions to establish underwater research programs and curriculums that build capacity and encourage the next generation of researchers and conservationists.
- **Activity RM 3.5:** Consult with Indigenous communities to conduct collaborative research.

- **Activity RM 3.6:** Build international relationships and investigate partnership opportunities for United States-Canada collaboration on historic and cultural preservation initiatives.
- **Activity RM 3.7:** Build relationships with archival institutions and repositories to preserve historical and archival Lake Ontario materials.
 - a. Seek out opportunities to acquire historical and archival materials following establishment of collections and accession guidance.
 - b. Partner with archival institutions and repositories to store these materials and make them accessible to the public.

STRATEGY RM-4: Develop citizen science research programs and educational opportunities.

- **Activity RM 4.1:** Facilitate the establishment of citizen science research programs that can help collect information about the condition of sanctuary resources, as well as visitor use.
 - a. Recruit and train volunteers to assist sanctuary staff with research projects.
 - b. Establish a training program or adopt an existing maritime archaeology training course to provide local training opportunities for certified divers.
 - c. Train volunteer teams to undertake periodic monitoring of beaches to look for shipwrecks washing up on shore or becoming exposed on beaches due to flooding.
 - d. Develop assessment protocols for newly located shipwrecks.
 - e. Explore opportunities for citizen scientists to share their knowledge and information about the sanctuary to local residents and visitors.
- **Activity RM 4.2:** Work with partner institutions, organizations, and Indigenous communities to establish research opportunities for students.

Education and Outreach Action Plan

Description

The purpose of this action plan is to enhance public awareness, understanding, and stewardship of sanctuary resources and their connection to the environment and history of Lake Ontario, the St. Lawrence River, the Great Lakes, and the ocean. Education and outreach activities would focus on the historical significance of these underwater resources on culture and activities in the area, including Indigenous cultures and activities, and the connection of this sanctuary to the natural environment of the region.

Background

Sanctuary education and outreach programs are designed to raise public awareness about the sanctuary; inspire stewardship of the resources and surrounding environment; increase knowledge about Lake Ontario and Great Lakes maritime heritage; and promote understanding about the Great Lakes environment. Education and outreach includes both formal and informal programs for learners of all ages, including students, teachers, local residents (both full-time and seasonal), visitors, and other constituents.

The sanctuary will use education and outreach efforts to address specific priority issues identified in the management plan. Education is essential to achieving the sanctuary's management objectives and will be used to both complement and promote resource protection and research programs.

Goal

Provide innovative, technology-driven, authentic, and place-based educational and outreach opportunities that promote learning, understanding, appreciation, and involvement in the protection and stewardship of sanctuary resources, Lake Ontario, the Great Lakes, and the ocean.

Objectives

- Provide leadership in assessing educational interests of residents, visitors, K–12 schools, and higher education, including local, regional, statewide, national, and international educational institutions
- Develop new and integrate existing ONMS education and outreach programs, including those with maritime heritage and ocean and climate literacy content that complement and promote sanctuary resource protection, research, and stewardship efforts
- Create and implement education programs in collaboration with key partners that promote awareness and understanding of sanctuary resources, Lake Ontario's maritime heritage, the maritime cultural landscape, and the Great Lakes environment
- Develop and implement education programs and partnerships that promote awareness and interaction with the National Marine Sanctuary System and NOAA
- Encourage the involvement of volunteers to foster understanding and participation in the protection and stewardship of sanctuary resources
- Engage and provide educational opportunities to all communities surrounding the sanctuary, including underserved communities and Indigenous nations and tribes
- Actively support education programs of state/local agencies and other partners that promote awareness of Lake Ontario's historic and ecological resources.

Strategies

STRATEGY EO-1: Increase awareness and knowledge of sanctuary resources, Lake Ontario, the Great Lakes, and the ocean through education programs.

- **Activity EO 1.1:** Conduct an inventory of local, state, and regional educational institutions, and the maritime and recreation industry to identify opportunities for partnerships.
- **Activity EO 1.2:** Develop a plan to offer sanctuary maritime heritage and ocean and climate literacy content to educators, community members, and students.
 - a. Work with education and outreach partners and with state and local historical societies to develop a plan that identifies areas to integrate NOAA and sanctuary content into school curricula.
 - b. Promote and coordinate consistency of sanctuary education materials with local, county, and state organizations that find an interest in sanctuary programs

- c. Leverage NOAA's resources to facilitate training sessions and workshops for educators, community members, and students.
 - d. Conduct NOAA and sanctuary-specific educational programs for regional schools.
- **Activity EO 1.3:** Facilitate distance and virtual learning with Lake Ontario museums and other locations statewide and nationwide.
 - a. Leverage ONMS distance learning programs and social media campaigns (e.g., Earth Is Blue) to create, showcase, and distribute curriculum and multimedia content from around NOAA, the National Marine Sanctuary System, and partner expeditions worldwide (e.g., *Nautilus Live*).
 - b. Collaborate with New York Sea Grant, the State University of New York (SUNY) campuses, New York Coastal Management Program, and other partners to plan and participate on joint distance learning projects.
- **Activity EO 1.4:** Collaborate with Indigenous nations and tribes, those within the Haudenosaunee Confederacy, to ensure that content on the Haudenosaunee and other Indigenous cultures in upstate New York is incorporated into educational and outreach materials.
- **Activity EO 1.5:** Promote marine technology as a way to enhance science, technology, engineering, arts, mathematics, and social studies (STEAMS) education and possible entrepreneurial economic development opportunities in the region.
 - a. Foster awareness and participation in the Marine Advanced Technology Education (MATE) Center's remotely operated vehicle competition.
 - b. Collaborate with local educators to develop a strategy for engaging mentors and students in the MATE competition and other relevant marine technology learning initiatives.
 - c. Work with partners, such as New York Sea Grant and SUNY Oswego, to identify multidisciplinary STEAMS initiatives that would support NOAA science initiatives.

STRATEGY EO-2: Increase awareness and knowledge of sanctuary resources, Lake Ontario, the Great Lakes, and the ocean through outreach programs.

- **Activity EO 2.1:** Develop new or adopt existing maritime heritage education programs, outreach materials, and exhibits for use in museums, visitor centers, boat landings, and other outdoor recreation venues.
 - a. Identify areas of collaboration between NOAA, educational and outreach institutions, museums, maritime industry, recreation businesses, and visitor centers in sanctuary communities.
 - b. Identify funding opportunities that will help establish a sanctuary interpretive presence in local partner venues.
 - c. Conduct sanctuary-related presentations at museums, visitor centers, national parks, schools and community colleges, Boys and Girls clubs, neighborhood centers, chambers of commerce, and other relevant locations within sanctuary communities.

- d. Identify programs and exhibits about ecosystem topics of relevance to the sanctuary and its resources (e.g., SUNY Oswego Meteorology, SUNY College of Environmental Science and Forestry, SUNY Cayuga Community College, Cornell University).
- **Activity EO 2.2:** Develop different types of outreach materials for a variety of users.
 - a. Develop interpretive materials for visitors to H. Lee White Museum, historical societies, Fort Ontario State Historic Site, Safe Haven Museum & Education Center, Lighthouse of Lake Ontario, Seaway Trail, Erie Canalway National Heritage Corridor, Port of Oswego, county and state tourism offices, SUNY Oswego, and other institutions of higher learning.
 - b. Create interpretive materials for recreational users (e.g., divers, snorkelers, kayakers, fishers, boaters) that encourage the sustainable stewardship of sanctuary resources.
 - c. Create virtual 360-degree dives and related remote experiences in the sanctuary. This virtual reality experience is made possible through technology that produces 360-degree images that are "stitched" together from a series of underwater photos.
 - d. Create opportunities for digital immersive experiences at interpretation centers in the region.

STRATEGY EO-3: Enhance sanctuary communications to create greater awareness.

- **Activity EO 3.1:** Develop a communications/implementation master plan for the sanctuary communities.
- **Activity EO 3.2:** Explore potential partnerships with university communications and journalism programs, local public broadcast television, and radio stations.
- **Activity EO 3.3:** Identify and leverage local, regional, and national media contacts to increase awareness about the sanctuary and its programs.
- **Activity EO 3.4:** Develop content for the Lake Ontario National Marine Sanctuary website and social media to provide quality, up-to-date information about the sanctuary.
- **Activity EO 3.5:** Sponsor, organize, and participate in outreach opportunities that promote the sanctuary's mission and that allow for dissemination of sanctuary information.
 - a. Participate in local community events, such as festivals and open houses.
 - b. Provide presentations about the sanctuary at local, regional, and national trade shows, workshops, and conferences targeted at specific impact groups, including divers, resource managers, and maritime history and archaeology professionals.
 - c. Hold periodic public roundtables or meetings in each partner county to maintain open communication.

Tourism and Economic Development Action Plan

Description

The purpose of this action plan is to promote sustainable and community-based tourism and economic development initiatives in Lake Ontario communities in collaboration with communities.

Background

National marine sanctuaries attract visitors who seek places to experience these special underwater treasures and the adjacent coastal communities. Sanctuaries also offer an opportunity for local businesses to support the tourism industry and invest in initiatives that directly or indirectly support the sanctuary.

Goal

Create an environment that will promote sustainable and equitable access to community-based tourism opportunities, and support business growth through collaboration with the region's various cultural and historic resources.

Objectives

- To inspire community-based stewardship and sustainable use of sanctuary resources
- Engage with local hospitality, tourism, recreation, and other related businesses on potential sustainable and responsible business opportunities associated with the sanctuary
- Encourage local, county, regional, state, and federal agencies including economic development agencies, tourism and outdoor recreation offices, and chambers of commerce to use the sanctuary as an economic development and sustainable tourism asset to bring people to the region and help sustain local economies
- Ensure, through close and meaningful consultation, that tourism and economic development activities involving the sanctuary are identified and conducted in a way that respects and acknowledges the lands and waters of the Indigenous nations and tribes

Strategies

STRATEGY TE-1: Identify hospitality, recreation, tourism, and other business sectors within the region and establish communications and partnership building opportunities.

- **Activity TE 1.1:** Provide training opportunities on how businesses might incorporate the responsible use of the sanctuary into their business plans.
- **Activity TE 1.2:** Provide in-person and remote opportunities for local business owners to learn firsthand about the sanctuary.
- **Activity TE 1.3:** Help identify opportunities and methods for businesses to include their proximity to the sanctuary in their marketing and branding.

- **Activity TE 1.4:** Provide connections and explore opportunities to leverage connections with the ONMS Business Advisory Council.
- **Activity TE 1.5:** Work with the Sanctuary Advisory Council and local businesses to be an active participant in the ONMS Business Recognition Program.

STRATEGY TE-2: Establish working relationships with economic development agencies and collaborate on strategies to use the sanctuary as a development asset.

- **Activity TE 2.1:** Identify and contact local, county, regional, and state economic development agencies to provide training on what the sanctuary is and the role it can and will play in the region.
- **Activity TE 2.2:** Encourage agencies to incorporate the responsible use of the sanctuary into economic development strategies as a tool for development.
- **Activity TE 2.3:** Work with economic development agencies to identify potential tools available to assist businesses interested in growing their operations using the sanctuary as an asset, or assisting new business startups resulting from the sanctuary.
- **Activity TE 2.4:** Provide communication materials of socioeconomic research of the sanctuary that economic development agencies may use to improve awareness of the sanctuary with local developers, financial institutions, venture capitalists, and others who may assist with business development and startup.

STRATEGY TE-3: Establish working relationships with local, regional, state, and national outdoor recreation and tourism sectors (i.e., agencies, industry, universities, and chambers of commerce) to develop strategies and assets to enhance sustainable tourism opportunities surrounding the sanctuary.

- **Activity TE 3.1:** Contact tourism agencies and chambers of commerce to provide training that enhances awareness about the sanctuary and how it will enhance regional marine resources.
- **Activity TE 3.2:** Work with the tourism industry and chambers of commerce to see how local tourism businesses might use the sanctuary as a tool to attract more visitors to the region.
- **Activity TE 3.3:** Partner with local, regional, state, and national tourism and outdoor recreation sectors (i.e., agencies, industry, universities, and chambers of commerce) to increase awareness and appreciation about the sanctuary and promote regional sustainable tourism and economic development strategies.
- **Activity TE 3.4:** Partner with New York state to enhance welcome/visitor centers through the addition of interpretive materials and exhibits to raise awareness and understanding about the sanctuary.
- **Activity TE 3.5:** Encourage sustainable and community-based tourism by focusing on places that are authentic, specialized, unique, and homegrown, with unspoiled scenery, locally owned businesses, historic small towns, and walkable downtowns.

- **Activity TE 3.6:** Encourage local communities and partners to offer voluntourism opportunities to foster understanding and participation in the protection and stewardship of sanctuary resources.

Resource Protection Action Plan

Description

The purpose of this action plan is to strengthen resource protection by promoting responsible use of sanctuary resources, developing resource protection-focused outreach, responsible tourism and education initiatives, conducting on-water resource protection activities, enhancing enforcement efforts, and assessing how climate change may impact sanctuary resources.

Background

The sanctuary encourages public access to its resources and strives to balance increased visitation with resource management and preservation. Ever changing natural and human processes can threaten the long-term sustainability of New York's maritime heritage resources, including Indigenous cultural heritage resources, shipwrecks, and other underwater cultural and historical resources. While the effects of natural and human-caused processes, such as climate change, ice formation, or invasive mussel damage on shipwrecks, will be studied using strategies found in the Research and Monitoring Action Plan, the Resource Protection Action Plan is designed to assess and reduce human impacts on sanctuary resources. In practice, the two plans will be highly integrated. Human activities have the greatest potential for harming shipwrecks and other underwater cultural resources. These activities include improper anchoring, inadvertent and intentional diving practices that damage resources, entanglement of fishing gear on wrecks, and artifact removal. The two plans will also address longer term impacts, such as understanding, mitigating, and adapting to the effects of climate change on sanctuary resources.

Goal

Strengthen resource protection in the proposed sanctuary through resource-specific initiatives and compliance with sanctuary regulations, while increasing sustainable and equitable access.

Objectives

- Improve understanding of visitor use patterns and the effects of these uses on the resources
- Develop a robust shipwreck mooring program and other methods to mitigate anchor impacts and allow for exploration
- Increase responsible and equitable access and awareness of sanctuary resources while promoting and facilitating responsible use
- Establish interagency collaboration for enforcement, including on-water and interpretive enforcement, as a resource protection tool

Strategies

STRATEGY RP-1: Establish a shipwreck mooring program/system within the sanctuary.

- **Activity RP 1.1:** Develop a five-year mooring plan that addresses mooring design and prioritizes mooring deployment based on an assessment of risks and benefits with operational plans for installation, redeployment, and maintenance of mooring buoys. These moorings would include buoys and other types of access infrastructure for sites where buoy placement is not advisable.
- **Activity RP 1.2:** Develop best practices for anchoring at sites where moorings are not yet installed or are not feasible, and develop a companion public awareness plan.
- **Activity RP 1.3:** Gather input from the Sanctuary Advisory Council and recreational/scientific diver and boating working groups on plans outlined above.
- **Activity RP 1.4:** Work with local dive charter operators, dive clubs, and recreational fishermen to monitor moorings throughout the dive season.

STRATEGY RP-2: Ensure compliance with sanctuary regulations and other applicable state and federal laws.

- **Activity RP 2.1:** Ensure sufficient enforcement presence in the sanctuary through partnerships and applicable interagency coordination.
 - a. Working through NOAA's Office for Law Enforcement, develop agreements with the U.S. Coast Guard, state agencies, and county and local agencies.
 - b. Develop an interagency communication and emergency response plan.
 - c. Host community workshops on law enforcement as related to maritime heritage resources.
 - d. Explore feasibility of using various technologies to monitor the sanctuary.
- **Activity RP 2.2:** Use interpretive enforcement as a tool to inform users about sanctuary regulations.
 - a. Provide information to law enforcement personnel on interpretive enforcement and guidelines; develop outreach materials for enforcement officers to distribute while patrolling the sanctuary.
 - b. Integrate interpretive enforcement into shoreside signs throughout the sanctuary.
 - c. Include informational inserts about the sanctuary in New York boat registration and renewal packets.
 - d. Provide U.S. Coast Guard Auxiliary members, marina employees, and other appropriate individuals and organizations with information about sanctuary regulations.

STRATEGY RP-3: Assess and reduce human impacts on sanctuary resources and communities.

- **Activity RP 3.1:** Assess the amount and type of marine debris, including fishing gear, plastics, and other items, that may entangle and impact sanctuary resources. Include marine debris as part of the sanctuary's long-term monitoring plan.
- **Activity RP 3.2:** Partner with others in the community to remove marine debris from the sanctuary.
- **Activity RP 3.3:** Conduct a climate vulnerability assessment to identify how and why biological and cultural resources, as well as ecosystem services, may be affected by future climate and Lake Ontario conditions.
- **Activity RP 3.4:** Develop a climate adaptation plan, detailing management actions that target specific climate impacts and vulnerabilities identified in Activity RP 3.1 to increase the resilience and adaptability of sanctuary resources to climate change.

STRATEGY RP-4: Increase and encourage access and responsible use of sanctuary resources by fostering greater awareness among recreational users.

- **Activity RP 4.1:** Build capacity for equitable access and responsible use of sanctuary resources by fostering greater awareness and adopting best practices among user groups.
- **Activity RP 4.2:** Provide practical information for users, such as shipwreck identification maps and information, access points, regulations, and contact information.
 - a. In coordination with other education, outreach, and visitor activities, develop outreach materials and web-based information to encourage responsible and sustainable uses of sanctuary resources.
 - b. Explore the use of technology as a means of providing users interpretive materials at shipwreck sites.
 - c. Investigate implementing "recognition programs" for local outfitters, businesses, and local activities that actively promote responsible recreational and stewardship of sanctuary resources (i.e., ONMS' Business Recognition Program).
 - d. Explore opportunities to provide online, written, or other appropriate information to the public about the shipwrecks, sanctuary regulations, best practices, and enforcement/emergency contact information at marinas, boat ramps, dive shops, fishing and diving charter operators, dive clubs, recreation activity shows (i.e., Beneath the Sea, Syracuse boat show), parks, other access points, and venues like visitor centers.
 - e. Explore and improve equitable access to sanctuary resources for boaters, kayakers, snorkelers, and fishers.
 - f. Evaluate the effectiveness of approaches taken.

STRATEGY RP-5: Evaluate approaches to protect the wreck of the HMS *Ontario* under the National Marine Sanctuaries Act.

- **Activity RP 5.1:** Develop a plan and feasibility study that outlines a process to consider including the site of the HMS *Ontario* as part of Lake Ontario National Marine Sanctuary at a future time.
 - a. Explore developing specific zoning and regulations that might be considered to effectively manage and protect the site of the HMS *Ontario*.
- **Activity RP 5.2:** Pursue locating the site of the HMS *Ontario*
 - a. Coordinate with community stakeholders and independent researchers to collate and manage data associated with the HMS *Ontario*.
 - b. Develop a research design and proposed survey methodology to locate and characterize the HMS *Ontario*.

STRATEGY RP-6: Evaluate opportunities to consider future sanctuary expansion to include the Thousand Islands region of the St. Lawrence River as there was considerable support for this area being included in the boundary.

- **Activity RP 6.1:** Work with the Sanctuary Advisory Council and local communities to consider a process to evaluate and consider including portions of the Thousand Islands region of the St. Lawrence River as part of Lake Ontario National Marine Sanctuary at a future time.

Costs

The National Marine Sanctuaries Act requires NOAA to include “*an estimate of the annual cost to the Federal Government of the proposed designation, including costs of personnel, equipment and facilities, enforcement, research, and public education.*” 16 U.S.C. § 1434(a)(2)(C)(v). NOAA estimates these annual costs to be between \$400,000 and \$1,500,000 depending on the availability of funding.

Management of the proposed sanctuary is envisioned to be funded by a mix of federal appropriations and external funding from collaborations with other agencies and organizations, and in-kind/volunteers and supplies. The federal budget for the proposed sanctuary will be contingent on several factors, including the annual Congressional appropriations levels and spending priorities determined by NOAA leadership. Collaboration with partners, including other NOAA programs, other federal agencies, state of New York, universities, private for-profit companies, and non-profit organizations, is also anticipated to help implement key programs and activities. The activities NOAA will focus on after designation include:

- hiring a sanctuary superintendent;
- establishing an administrative office;
- supporting the operation of a Sanctuary Advisory Council;
- staff support for sanctuary administration and operation;
- staff support for resource protection needs including establishing a shipwreck mooring program;
- assessing and reducing human impacts, and reviewing planned projects in the sanctuary;

- creating a NOAA presence with exhibits, signage, and other education and outreach activities as described in the Education and Outreach Action Plan;
- mapping, characterization, archaeological documentation, and other activities described in the Research and Monitoring Action Plan;
- evaluating requirements for a dedicated sanctuary research vessel, including the design, build, and initial operation;
- implementing volunteer citizen science programs; and
- implementing and promoting sustainable recreation and tourism activities.

Appendix B:

Compliance with Additional Regulatory Requirements

This section summarizes NOAA's compliance with additional statutory or regulatory requirements that apply to the proposed action.

B.1 Consultations under the National Marine Sanctuaries Act (NMSA)

Under section 303(b)(2) of the NMSA, NOAA is required to conduct a series of consultations with Congress, federal and state agencies, and other interested agencies. Per this requirement, consultation letters were sent upon publication of the draft EIS to the following parties:

- U.S. House of Representatives Natural Resources Committee
- U.S. Senate Committee on Commerce, Science, and Transportation
- Department of Defense
- Department of State
- Department of Transportation
- Department of the Interior

NOAA also sent copies of the draft EIS to the following agencies and organizations, consistent with NEPA requirements for inviting comments (40 CFR 1503.1 (1978)):

- Cayuga Nation
- Oneida Nation
- Onondaga Nation
- Seneca Nation of Indians
- Saint Regis Mohawk Tribe
- Tonawanda Seneca Nation
- Tuscarora Nation of New York
- Department of Transportation St. Lawrence Seaway Development Corporation
- State of New York
- U.S. Environmental Protection Agency
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- U.S. Coast Guard
- U.S. Navy, Naval History and Heritage Command

The EPA responded on September 1, 2021 and did not identify any environmental impacts requiring substantive changes to the alternatives presented or associated with the actions set forth in the draft EIS. The U.S. Army Corps of Engineers responded August 23, 2021, suggesting specific language regarding exclusions to the proposed sanctuary boundary options. NOAA incorporated several of these suggestions in Sections 3.4.1.2 and 3.5.1.2 of this final EIS. The Department of Transportation St. Lawrence Seaway Development Corporation responded on October 6, 2021, expressing concern with the boundary extending into the St. Lawrence River under Alternative 1 and support for Alternative 2.

B.2 Endangered Species Act (16 USC 1531 et seq.)

Section 7 of the Endangered Species Act (ESA) requires all federal agencies, in consultation with U.S. Fish and Wildlife Service or National Marine Fisheries Service (NMFS), to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species, or result in the destruction or adverse modification of the critical habitat of such species. In fulfilling these requirements, each agency must use the best scientific and commercial data available. The regulations promulgated at 50 CFR Part 402 govern the consultation process.

In section 4.5.1.4 of this final EIS, NOAA identified four ESA-listed species under USFWS jurisdiction potentially present in the action area and one designated critical habitat unit for piping plover in the action area. NOAA then evaluated which of these species and habitat would likely be present in the action area and affected by the implementing either of the action alternatives and described any potential impacts in section 5.3.4.1. There are no listed species or designated critical habitat under NMFS jurisdiction found in the action area.

NOAA evaluated the habitat requirements and habitat availability for these four species under USFWS jurisdiction within the action area and determined that implementing either of the alternatives would have **no effect** on these species for the following reasons:

- Low intensity of activities that would occur within the sanctuary, especially along the shoreline where these species would most likely occur
- Short duration and rarely observed nesting period and infrequent observations of piping plovers along the shoreline within the action area
- Potential habitat for the Indiana bat, northern long-eared bat, and bog turtle does not exist near shorelines where they may be disturbed by sanctuary activities
- Types of management activities that would occur in the proposed sanctuary would not be disruptive to roosting bats (R. Niver, personal communication, April 7, 2020)

In addition, NOAA determined that implementing either of the action alternatives would have **no effect on designated critical habitat** for the piping plover because field activities to implement the proposed sanctuary management plan would primarily occur within buildings or on the water and would not include any ground-disturbing activities within the designated critical habitat unit along the shoreline of Lake Ontario. Therefore, NOAA's action would not result in a direct or indirect alteration in any of the essential features of designated critical habitat that would appreciably diminish the value of critical habitat for both the survival and recovery of the piping plover (see Section 5.3.4.1).

NOAA concludes that implementing either of the action alternatives would have no effect on ESA-listed species or designated critical habitat. Therefore, NOAA is not required to consult with USFWS under Section 7 of the ESA.



United States Department of the Interior

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<http://www.fws.gov/northeast/nyfo/es/section7.htm>



In Reply Refer To:

April 23, 2021

Consultation Code: 05E1NY00-2020-SLI-2428

Event Code: 05E1NY00-2021-E-07474

Project Name: Proposed Designation of Lake Ontario National Marine Sanctuary

Subject: Updated list of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). This list can also be used to determine whether listed species may be present for projects without federal agency involvement. New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list.

Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list. If listed, proposed, or candidate species were identified as potentially occurring in the project area, coordination with our office is encouraged. Information on the steps involved with assessing potential impacts from projects can be found at: <http://www.fws.gov/northeast/nyfo/es/section7.htm>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the Services wind

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Event Code: 05F1NY00-2021-F-07474

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energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/contow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the ESA. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

04/23/2021

Event Code: 05F1NY00-2021-F-07474

1

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9385
(607) 753-9334

04/23/2021

Event Code: 05F1NY00-2021-F-07474

2

Project Summary

Consultation Code: 05E1NY00-2020-SLI-2428

Event Code: 05F1NY00-2021-F-07474

Project Name: Proposed Designation of Lake Ontario National Marine Sanctuary

Project Type: ** O'ILLER **

Project Description: The National Oceanic and Atmospheric Administration's (NOAA's) Office of National Marine Sanctuaries (ONMS) proposes to designate a national marine sanctuary in New York's eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River. The proposed sanctuary would protect a collection of nationally significant maritime heritage resources, including historic shipwrecks.

In establishing the proposed sanctuary, NOAA would:

- 1) Set a boundary to protect these nationally significant shipwrecks and other underwater cultural resources and to interpret the maritime cultural landscape that surrounds them;
- 2) Develop and implement a management plan to provide a comprehensive, long-term plan to manage the sanctuary; and
- 3) Create and implement regulations to protect underwater cultural resources.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@43.64875449262665,-76.46032641933303,14z>



Counties: New York

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Indiana Bat <i>Myotis sodalis</i> There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8045	Threatened

Birds

NAME	STATUS
Piping Plover <i>Charadrius melodus</i> Population: [Great Lakes watershed DPS] - Great Lakes, watershed in States of IL, IN, MI, MN, NY, OH, PA, and WI and Canada (Ont.) There is final critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Endangered

Reptiles

NAME	STATUS
Bog Turtle <i>Clemmys muhlenbergii</i> Population: Wherever found, except GA, NC, SC, TN, VA No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6962	Threatened

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Event Code: 05F1NY00-2021-F-07474

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Critical habitats

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Piping Plover <i>Charadrius melodus</i> https://ecos.fws.gov/ecp/species/6039#crithab	Final



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In Reply Refer To:

April 23, 2021

Consultation Code: 05E1NY00-2020-SLI-2242

Event Code: 05E1NY00-2021-E-07476

Project Name: Proposed Designation of Lake Ontario NMS - Area 2

Subject: Updated list of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). This list can also be used to determine whether listed species may be present for projects without federal agency involvement. New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list.

Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list. If listed, proposed, or candidate species were identified as potentially occurring in the project area, coordination with our office is encouraged. Information on the steps involved with assessing potential impacts from projects can be found at: <http://www.fws.gov/northeast/nyfo/es/section7.htm>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the Services wind

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Event Code: 05F1NY00-2021-F-07476

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energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/contow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the ESA. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

04/23/2021

Event Code: 05F1NY00-2021-F-07476

1

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9385
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Event Code: 05F1NY00-2021-F-07476

2

Project Summary

Consultation Code: 05E1NY00-2020-SLI-2242

Event Code: 05F1NY00-2021-F-07476

Project Name: Proposed Designation of Lake Ontario NMS - Area 2

Project Type: ** O'ILLER **

Project Description: The National Oceanic and Atmospheric Administration's (NOAA's) Office of National Marine Sanctuaries (ONMS) proposes to designate a national marine sanctuary in New York's eastern Lake Ontario and the Thousand Islands region of the St. Lawrence River. The proposed sanctuary would protect a collection of nationally significant maritime heritage resources, including historic shipwrecks.

In establishing the proposed sanctuary, NOAA would:

- 1) Set a boundary to protect these nationally significant shipwrecks and other underwater cultural resources and to interpret the maritime cultural landscape that surrounds them;
- 2) Develop and implement a management plan to provide a comprehensive, long-term plan to manage the sanctuary; and
- 3) Create and implement regulations to protect underwater cultural resources.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@44.2974799321849,-76.03967932205273,14z>



Counties: Jefferson and St. Lawrence counties, New York

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

- 1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Indiana Bat <i>Myotis sodalis</i> There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

B.3 Migratory Bird Treaty Act (16 USC 703 et seq.)

The Migratory Bird Treaty Act (MBTA) implements the United States' commitment to bilateral treaties, or conventions, with Great Britain, Canada, Japan, Russia, and Mexico for the protection of shared migratory bird resources. The MBTA establishes that it is unlawful to pursue, hunt, take, capture, kill, or sell migratory birds, unless authorized by a permit issued by the Secretary of the Interior. The MBTA protects over 800 bird species, a list of which is maintained at 50 CFR 10.13. The statute does not discriminate between live or dead birds and gives full protection to any bird parts, including feathers, eggs, and nests.

NOAA used the USFWS's ECOS IPaC tool to search for migratory bird species that may be present in the proposed sanctuary area. The ECOS IPaC tool identified 22 migratory birds of concern that may occur in or near the area (Consultation Codes: 05E1NY00-2020-SLI-2242 & -2428, April 23, 2021; R. Niver, personal communication, April 7, 2020). These 22 bird species may occasionally be found transiting through the proposed sanctuary area and resting or foraging within the action area (see Table B.1). As discussed in sections 5.3.4.2 and 5.4.4.2, NOAA has determined that implementing either of the action alternatives would not result in the take of migratory birds.

Table B.1. U.S. Fish and Wildlife Service Migratory Birds in the Proposed Sanctuary Action Area. Source: <https://ecos.fws.gov/ipac/>

*Status Types

BCC	Bird of conservation concern
BCR	BCC only in Bird Conservation Region
CON	BCC throughout range
non-BCC Vulnerable	not BCC but warrants attention due to Eagle Act or from potential offshore activities

Common Name	Species	Status*	Breeding Season	Onsite Habitat Use	Could Occur in Eastern Lake Ontario	Could Occur in Thousand Islands Region in St. Lawrence River
American golden-plover	<i>Pluvialis dominica</i>	BCC Rangewide (CON)	Breeds elsewhere	Resting, foraging	✓	x
Bald eagle	<i>Haliaeetus leucocephalus</i>	Non-BCC Vulnerable	Breeds Dec 1 to Aug 31	Resting, foraging	✓	✓
Black-billed cuckoo	<i>Coccyzus erythrophthalmus</i>	BCC Rangewide (CON)	Breeds May 15 to Oct 10	Resting, foraging	✓	✓
Bobolink	<i>Dolichonyx oryzivorus</i>	BCC Rangewide (CON)	Breeds May 20 to Jul 31	Resting, foraging	✓	✓
Buff-breasted sandpiper	<i>Calidris subruficollis</i>	BCC Rangewide (CON)	Breeds elsewhere	Resting, foraging	✓	x

Common Name	Species	Status*	Breeding Season	Onsite Habitat Use	Could Occur in Eastern Lake Ontario	Could Occur in Thousand Islands Region in St. Lawrence River
Canada warbler	<i>Cardellina canadensis</i>	BCC Rangewide (CON)	Breeds May 20 to Aug 10	Resting, foraging	✓	✓
Cerulean warbler	<i>Dendroica cerulea</i>	BCC Rangewide (CON)	Breeds Apr 22 to Jul 20	Resting, foraging	✓	✓
Dunlin	<i>Calidris alpina arctica</i>	BCC - BCR	Breeds elsewhere	Resting, foraging	✓	✓
Eastern whip-poor-will	<i>Antrostomus vociferus</i>	BCC Rangewide (CON)	Breeds May 1 to Aug 20	Resting, foraging	✓	✓
Golden eagle	<i>Aquila chrysaetos</i>	Non-BCC Vulnerable	Breeds elsewhere	Resting, foraging	✓	✓
Golden-winged warbler	<i>Vermivora chrysoptera</i>	BCC Rangewide (CON)	Breeds May 1 to Jul 20	Resting, foraging	✓	✓
Henslow's sparrow	<i>Ammodramus henslowii</i>	BCC Rangewide (CON)	Breeds May 1 to Aug 31	Resting, foraging	✓	x
King rail	<i>Rallus elegans</i>	BCC Rangewide (CON)	Breeds May 1 to Sep 5	Resting, foraging	✓	x
Lesser yellowlegs	<i>Tringa flavipes</i>	BCC Rangewide (CON)	Breeds elsewhere	Resting, foraging	✓	✓
Long-eared owl	<i>Asio otus</i>	BCC Rangewide (CON)	Breeds Mar 1 to Jul 15	Resting, foraging	✓	✓
Prairie warbler	<i>Dendroica discolor</i>	BCC Rangewide (CON)	Breeds May 1 to Jul 31	Resting, foraging	✓	✓
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	BCC Rangewide (CON)	Breeds May 10 to Sep 10	Resting, foraging	✓	✓
Ruddy turnstone	<i>Arenaria interpres morinella</i>	BCC - BCR	Breeds elsewhere	Resting, foraging	✓	x
Semipalmated sandpiper	<i>Calidris pusilla</i>	BCC Rangewide (CON)	Breeds elsewhere	Resting, foraging	✓	✓

Common Name	Species	Status*	Breeding Season	Onsite Habitat Use	Could Occur in Eastern Lake Ontario	Could Occur in Thousand Islands Region in St. Lawrence River
Short-billed dowitcher	<i>Limnodromus griseus</i>	BCC Rangewide (CON)	Breeds elsewhere	Resting, foraging	✓	✓
Snowy owl	<i>Bubo scandiacus</i>	BCC Rangewide (CON)	Breeds elsewhere	Resting, foraging	✓	✓
Wood thrush	<i>Hylocichla mustelina</i>	BCC Rangewide (CON)	Breeds May 10 to Aug 31	Resting, foraging	✓	✓

B.4 New York State Listed Endangered, Threatened, and Special Fish & Wildlife Species of Concern

NYSDEC manages a list of Endangered, Threatened, and Special Concern animal species found in the state. The list includes several species that may occur in the proposed sanctuary area: one Endangered and one Threatened mammal species; five Endangered, eight Threatened, and four Special Concern bird species; four Endangered, four Threatened, and one Special Concern fish species; one Endangered, one Threatened, and one Special Concern reptile species; and one Endangered and one Special Concern insect species (N. Conrad, personal communication, Dec. 21, 2020). A discussion with the New York Natural Heritage program confirmed the potential occurrence of these species in the area (N. Conrad, personal communication, Dec. 21, 2020). A complete list of animal species that are considered Endangered, Threatened, or of Special Concern by New York state can be found on this [webpage](#).

Table B.2. New York State Listed Species in the Proposed Sanctuary Action Area. Source: New York State Department of Environmental Conservation <https://www.dec.ny.gov/animals/7494.html>

*Status Types

E State Endangered
T State Threatened
SC State Species of Special Concern

Common Name	Species	Status*	Life History	Occurrence	Could Occur in Eastern Lake Ontario	Could Occur in Thousand Islands Region in St. Lawrence River
Pugnose shiner	<i>Notropis anogenus</i>	E	Sensitive to change in specialized near-shore habitats where submerged aquatic vegetation dominates	Numbers are declining in Lake Ontario/ expanding in St. Lawrence	✓	✓
Spoonhead sculpin	<i>Cottus ricei</i>	E	Found in moderately deep (shore to 450 feet) lakes, larger rivers, and swift streams	No known current occurrence - historic only	✓	x
Deepwater sculpin	<i>Myoxocephalus thompsoni</i>	E	This species lives offshore in deep (82-1,200 feet) bottom areas of Lake Ontario	Uncommon	✓	x
Round whitefish	<i>Prosopium cylindraceum</i>	E	Historically found in Lake Ontario	Possibly extirpated	✓	x
Lake sturgeon	<i>Acipenser fulvescens</i>	T	Found in lakes and large rivers with mud, sand, and gravel substrate at depths of 16-33ft; larger fish occasionally taken at depths up to 141ft; in rivers, it prefers habitat in deep midriver areas and pools, where water depths vary between 13-30ft; populations are stable in Lake Ontario; species are not found in this part of the St. Lawrence River	Uncommon	✓	x

Common Name	Species	Status*	Life History	Occurrence	Could Occur in Eastern Lake Ontario	Could Occur in Thousand Islands Region in St. Lawrence River
Mooneye	<i>Hiodon tergisus</i>	T	Prefers clear water habitat of large streams, rivers, and lakes, including deep pools and backwaters	Extirpated in Lake Ontario / no records in this part of St. Lawrence	x	x
Lake chubsucker	<i>Erimyzon sucetta</i>	T		Possibly extirpated	x	x
Northern sunfish	<i>Lepomis peltastes</i>	T	Documented record (2004) of this species in a tributary at its mouth on the south side of Lake Ontario	Uncommon	✓	x
Redfin shiner	<i>Lythrurus umbratilis</i>	SC	Documented in tributary at south side of Lake Ontario	Uncommon	✓	x
Bog turtle	<i>Glyptemys muhlenbergii</i>	E	Occupies open-canopy, herbaceous sedge meadows and fens bordered by wooded areas	Uncommon	✓	x
Blanding's turtle	<i>Emydoidea blandingii</i>	T	Documented in wetlands in both Lake Ontario and St. Lawrence shore areas	Uncommon	✓	✓
Spiny softshell turtle	<i>Apalone spinifera</i>	SC	Documented in bays on the south side of Lake Ontario	Uncommon	✓	x
Piping plover	<i>Charadrius melodus</i>	E	Forages and breeds on sandy beaches	Uncommon	✓	x
Black tern	<i>Chlidonias niger</i>	E	Uses semi-secluded freshwater marshes and forages in nearby open bodies of water	Uncommon	✓	✓
Peregrine falcon	<i>Falco peregrinus</i>	E	Uses a wide variety of habitats that provide avian prey; no known nesting in the area	Uncommon	✓	✓
Short-eared owl	<i>Asio flammeus</i>	E	Preys upon small mammals in open areas; breeds in the area but is more common in winter	Uncommon	✓	x

Common Name	Species	Status*	Life History	Occurrence	Could Occur in Eastern Lake Ontario	Could Occur in Thousand Islands Region in St. Lawrence River
Loggerhead shrike	<i>Lanius ludovicianus</i>	E	Prefers open landscapes, roadsides, golf courses, riparian areas, steppes, deserts, savannahs, prairies, and occasionally, suburban areas; no known nesting in the area	Uncommon	✓	✓
Upland sandpiper	<i>Bartramia longicauda</i>	T	Breeds in open areas with a mixture of short grass areas for feeding and courtship, interspersed with taller grasses and forbs for nesting and brood cover	Uncommon	✓	✓
Pied-billed grebe	<i>Podilymbus podiceps</i>	T	Nests in freshwater wetlands with open shallow water and an abundance of aquatic emergent vegetation; uncommon local breeder; fairly common migrant, though more numerous in fall, and a rare but regular winter visitor	Uncommon	✓	✓
Least bittern	<i>Ixobrychus exilis</i>	T	Breeds in freshwater marshes with tall emergent vegetation, such as cattail, interspersed with open water	Uncommon	✓	✓
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Breeds in undisturbed forested areas, near lakes, rivers, or wetlands, especially in complex forested habitats with variable structure; during winter, congregates at larger rivers where water remains open and food resources are abundant and accessible	Uncommon	✓	✓
Northern harrier	<i>Circus cyaneus</i>	T	Breeds and winters in open wetlands, marshy meadows, wet, lightly grazed pastures, old fields, freshwater and brackish marshes, upland prairies, mesic grasslands, drained marshlands, croplands, and riparian woodland	Uncommon	✓	✓

Common Name	Species	Status*	Life History	Occurrence	Could Occur in Eastern Lake Ontario	Could Occur in Thousand Islands Region in St. Lawrence River
Common tern	<i>Sterna hirundo</i>	T	Uses a variety of habitats and may be found on coastal beaches or barrier islands, marshes, or inland lakes; nests on sand, gravel, shell, or cobble in open areas with some scattered vegetation or other cover in which chicks can find shelter; on the St. Lawrence River, most nest sites are on manmade structures, including break waters, water intake structures, and navigation cells	Uncommon	✓	✓
Sedge wren	<i>Cistothorus platensis</i>	T	Breeds in a variety of wetlands with dense, tall sedges and grasses, avoiding areas with standing water and cattails; areas include wet meadows, hayfields, marshes, upland edges of ponds, and sphagnum bogs	Uncommon	✓	x
Henslow's sparrow	<i>Ammodramus henslowii</i>	T	Prefers tall, dense grassy fields with no woody plants, some standing dead vegetation, and a thick litter layer; found largely in pastures, both active and inactive, and tolerates wet conditions	Uncommon	✓	x
Common loon	<i>Gavia immer</i>	SC	Breeds in freshwater habitats, nesting on bog mats, logs, large rocks, and along shorelines of both islands and the mainland; no known nesting on Lake Ontario	Uncommon	.	✓
American bittern	<i>Botaurus lentiginosus</i>	SC	Breeds in freshwater wetlands with tall emergent vegetation, especially larger wetlands with abundant amphibian populations	Uncommon	✓	✓
Osprey	<i>Pandion haliaetus</i>	SC	Breeds along coastal and inland shorelines where shallow water makes their fish prey more easily accessible	Uncommon	✓	✓

Common Name	Species	Status*	Life History	Occurrence	Could Occur in Eastern Lake Ontario	Could Occur in Thousand Islands Region in St. Lawrence River
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	SC	Documented in Lake Ontario shore areas	Uncommon	✓	x
Indiana bat	<i>Myotis sodalis</i>	E	Hibernates during winter in caves, or occasionally, in abandoned mines; roosts in summer under the peeling bark of dead and dying trees; eats a variety of flying insects found along rivers or lakes and in uplands	Uncommon	✓	✓
Northern long-eared bat	<i>Myotis septentrionalis</i>	T	May be found in a variety of forested and wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitat, as well as linear features, such as fence rows, riparian forests, and other wooded corridors; suitable winter habitat includes caves and cave-like structures (e.g., abandoned or active mines, railroad tunnels)	Uncommon	✓	✓
Bogbean buckmoth	<i>Hemileuca sp.</i>	E	Documented in wetlands adjacent to eastern Lake Ontario	Uncommon	✓	x
Olympia marble (butterfly)	<i>Euchloe Olympia</i>	SC	Documented in Lake Ontario shore area; habitat is limestone pavement barrens and alvar grassland	Uncommon	✓	x
Slender bulrush	<i>Schoenoplectus heterochaetus</i>	E	Documented in Black River Bay and Muskellunge Bay wetlands in northeastern Lake Ontario	Uncommon	✓	x

B.5 Executive Order 12898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898 directs that the programs of federal agencies identify and avoid disproportionately high and adverse effects on human health and the environment of minority or low-income populations. The designation of national marine sanctuaries by NOAA helps to ensure the enhancement of environmental quality for all populations in the United States. The alternatives described in this document would not result in disproportionate negative impacts on any minority or low-income population. In addition, many of the potential impacts from designating the proposed sanctuary would result in long-term or permanent beneficial impacts by protecting underwater cultural and historical resources, which may have a positive impact on communities by providing employment and educational opportunities, and potentially result in improved ecosystem services.

B.6 Coastal Zone Management Act

In 1972, Congress enacted the Coastal Zone Management Act (CZMA, 16 USC 1451 *et seq.*) to encourage coastal states, Great Lake states, and U.S. Territories and Commonwealths to preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone. Section 307 of the CZMA is known as the "federal consistency" provision. The federal consistency provision requires federal actions (inside or outside a state's coastal zone) that affect any land or water use or natural resource of a state's coastal zone, to be consistent with the enforceable policies of the state coastal management program. The term "effect on any coastal use or resource" means any reasonably foreseeable effect on any coastal use or resource resulting from the activity, including direct and indirect (cumulative and secondary) effects (15 CFR 930.11(g)). The federal consistency regulations can be found at 15 CFR part 930.

NOAA worked with the state of New York on developing the range of alternatives in this EIS because it takes place wholly within New York state waters. When NOAA published the NPRM, NOAA prepared a consistency determination and sent a letter to the New York Coastal Management Program to request the state's concurrence with the determination. The New York Coastal Management Program concurred with NOAA's consistency determination on April 7, 2023. Letters regarding the consistency determination are included below.

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DEPARTMENT OF STATE

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KATHY HOCHUL
 GOVERNOR

ROBERT J. RODRIGUEZ
 SECRETARY OF STATE

June 06, 2022

Julia Snouck-Hurgronje
 CPC Inc. supporting
 NOAA Office of National Marine Sanctuaries
 Protected Area Policy Division
 1305 East-West Highway, Rm 1141
 Silver Spring, MD 20910

Re: **O-2022-0027**
NOAA Office of Marine Sanctuaries
 Lake Ontario National Marine Sanctuary
Response to request for Preliminary Policy
identification

Dear Julia Snouck-Hurgronje:

The Department of State is in receipt of your correspondence dated May 23, 2022 where you “[request] *a list of New York’s enforceable policies relevant to [the Lake Ontario National Marine Sanctuaries Designation] so that [National Oceanic and Atmospheric Administration (NOAA)] may prepare a consistency determination.*”

Thank you for your early outreach and for the provision of a Draft Environmental Impact Statement and Draft Management Plan to aid in our initial review. As you know, the NYS Department of State would review your proposed action pursuant to 15 CFR Part 930 Subpart C.

NOAA Office of Marine Sanctuaries proposes to designate certain areas of NYS, as described in your correspondence, as a National Marine Sanctuary and anticipates drafting regulations, implementing a management plan and undertaking certain routine field activities. The proposed regulations envision prohibiting five (5) types of activities that may damage sanctuary resources without a permit.

We have reviewed your material and advise that your consistency determination address the following NYS Enforceable Coastal Policies. We are encouraged that, based on the information provided and NOAA’s commitment to close coordination with the Department throughout the designation process, your evaluation may indicate that the proposed action is advancing many of the applicable coastal policies.¹

1.) Restore, revitalize and redevelop deteriorated and underutilized waterfront areas for commercial, industrial, cultural, recreational and other compatible uses.

3.) Further develop the state’s major ports of Albany, Buffalo, New York, Ogdensburg and Oswego as centers of commerce and industry, and encourage the siting, in these port areas, including those under the jurisdiction of the state public authorities, of lands use and development which is essential to, or in support of, the waterborne transportation of cargo and people.

¹ Please note that this preliminary listing of potentially applicable policies is not necessarily comprehensive and may change based on available information. It does not consider any potential impacts associated with any potential onshore facilities that may be proposed in the future.



- 4.) Strengthen the economic base of smaller harbor areas by encouraging the development and enhancement of these traditional uses and activities which have provided such areas with their unique maritime identity.
- 6.) Expedite permit procedures in order to facilitate the siting of development activities at suitable locations.
- 7.) Significant Coastal Fish and Wildlife Habitats will be protected, preserved, and where practical, restored so as to maintain their viability as habitats.
- 9.) Expand recreational use of fish and wildlife resources in coastal areas by increasing access to existing resources, supplementing existing stocks, and developing new resources.
- 18.) To safeguard the vital economic, social and environmental interests of the State and of its citizens, proposed major actions in the coastal areas must give full consideration to those interests, and to the safeguards which the State has established to protect valuable coastal resources areas.
- 19.) Protect, maintain and increase the level and types of access to public water-related recreation resources and facilities.
- 21.) Water dependent and water enhanced recreation will be encouraged and facilitated, and will be given priority over non water dependent related uses along the coast.
- 23.) Protect, enhance and restore structures, districts, areas or sites that are of significance in the history, architecture, archaeology, or culture of the state, its communities, or the nation.
and
- 34.) Discharge of waste materials into coastal waters from vessels subject to state jurisdiction will be limited so as to protect significant fish and wildlife habitats, recreational areas and water supply areas.

Additionally, there are multiple Local Waterfront Revitalization Programs (LWRP) that may intersect, border, or that are substantially adjacent to your proposed sanctuary boundary. These LWRPs refine NYS's enforceable policies and should also be evaluated.² Several of these LWRPs utilize a different policy listing than the broader coastal area wide policies. In those situations, please see the attached matrix which compares the two formats. Please review the following LWRPs and determine if additional evaluation is needed should there be potential coastal effects: Village of Sodus Point, Town of Huron, City of Oswego, Village of Sackets Harbor, Village of Dexter, and the Village of Cape Vincent.

I appreciate your early outreach and am encouraged by the thorough analysis you have already undertaken. Please reach out to me at 518-473-3371 (email: matthew.maraglio@dos.ny.gov) if you would like to further discuss your anticipated consistency determination.

Sincerely,



Matthew P. Maraglio
Development Division Director
Office of Planning, Development and
Community Infrastructure

² Browse to <https://dos.ny.gov/local-waterfront-revitalization-program> for access to LWRPs

13 Policy format		Relevant Coastal Policy (44 policy format)
Policy 1	Foster a pattern of development in coastal area that enhances community character, preserves open space, makes efficient use of infrastructure, makes beneficial use of a coastal location, and minimizes adverse effects of development.	1,2, 5, 6 18, 22
Policy 2	Preserve historic resources of the coastal area.	23, 25
Policy 3	Enhance visual quality and protect outstanding scenic resources.	1, 24 and 25
Policy 4	Minimize loss of life, structures, and natural resources from flooding and erosion.	11, 12, 13, 14, 15, 16, 17, 18, 28
Policy 5	Protect and improve water resources	30, 31, 32, 33, 34, 35,36, 37, 38, 40, 43
Policy 6	Protect and restore ecological resources, including significant fish and wildlife habitats, wetlands and rare ecological communities.	7, 8, 9, 28, 35, 44
Policy 7	Protect and improve air quality in the coastal area.	41, 42, 43
Policy 8	Minimize environmental degradation in the coastal area from solid waste and hazardous substances.	8, 30, 34, 36, 37, 39
Policy 9	Provide for public access to, and recreational use of, coastal waters, public lands, and public resources of the coastal area.	9,18, 19, 20, 21, 22
Policy 10	Protect water-dependent uses and promote siting of new water-dependent uses in suitable locations and support efficient harbor operations.	2, 3, 4, 5, 18
Policy 11	Promote sustainable use of living marine resources in coastal waters.	7, 9, 10, 18, 40
Policy 12	Protect agricultural lands.	26, 35, 39
Policy 13	Promote appropriate use and development of energy and mineral resources.	18, 27, 29, 35, 36

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KATHY HOCHUL
 GOVERNOR
 ROBERT J. RODRIGUEZ
 SECRETARY OF STATE

April 7, 2023

Julia Snouck-Hurgronje
 NOAA Office of Marine Sanctuaries
 1305 East West Highway
 Silver Spring, MD 20910
julia.snouck-hurgronje@noaa.gov

Re: **F-2023-0043(DA)**
 National Oceanic and Atmospheric Administration
 Office of National Marine Sanctuaries
 Designation of the Lake Ontario National Marine
 Sanctuary in eastern Lake Ontario
Concurrence with Consistency Determination

Dear Julia Snouck-Hurgronje:

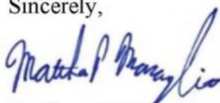
The Department of State received the National Oceanic and Atmospheric Administration's (NOAA) Consistency Determination and supporting information for this proposed Federal Agency Activity (15 CFR 930 Subpart C) on January 23, 2023 and on March 13, 2023 the Department of State, pursuant to 15 CFR 930.41(b), requested a fifteen (15) day extension of time to the Department of State's review period.

The Department of State has completed its review of the NOAA's consistency determination regarding the above proposed federal agency activity, with the New York State Coastal Management Program.

Based upon the information submitted, the Department of State concurs with NOAA's consistency determination regarding this matter.

Please feel free to contact David Newman at (518) 474-6000 or e-mail at: david.newman@dos.ny.gov and reference file no. F-2023-0043(DA).

Sincerely,



Matthew P. Maraglio
 Director, Development Division
 Office of Planning, Development and
 Community Infrastructure

MM/dn

CC: NOAA- Ellen Brody



Appendix C:

Analysis of Relevant Federal and State Statutes

Without adequate legal protection and enforcement, underwater archaeological sites are extremely vulnerable to human disturbance. Even when there are legal protections, gaps in the law, or in application of the law, can still result in damage and irreparable loss to underwater cultural and historical resources. There are laws already in place that can be employed to help protect the archaeological and cultural treasures of Lake Ontario, however, the following offers some examples of specific relevant federal and state laws and of the gaps in protection that remain, even where such laws are vigorously implemented.³² By designating the area as a national marine sanctuary under the National Marine Sanctuaries Act, NOAA would complement and supplement the existing resource-specific statutes and fill legal gaps to ensure this area of special national significance is managed, researched, interpreted, and publicly accessible in a coordinated and comprehensive manner that emphasizes resource protection.

C.1 Federal Statutes

Submerged Lands Act, 43 USC 1301 *et seq.*

Under the Submerged Lands Act, title to and ownership of the lands beneath navigable waters within the boundaries of the respective states, and the natural resources within such lands and waters, together with the right and power to manage, administer, lease, develop, and use the said lands and natural resources is recognized, confirmed, established, and vested in and assigned to the respective states. Thus, with certain exceptions, the United States relinquished to the states all right, title, and interest to all said lands, improvements, and natural resources generally out to three nautical miles from the coast line, or in the Great Lakes, out to the international boundary between the United States and Canada (43 U.S.C. 1311(a)-(b), 1312). The United States retains the right to regulate offshore activities in these areas for the constitutional purposes of navigation, national defense, international affairs, and commerce (*Id.* 1314(a)). In Lake Ontario, New York holds title to the majority of coastal waters and bottomland seaward from the low water datum (243.3 feet IGLD 1985) to the international boundary with Canada. This differs in the St. Lawrence River where New York holdings of coastal bottomlands generally begin at ordinary high water.

Abandoned Shipwreck Act of 1987, 43 USC 2101, *et seq.*

Under the Abandoned Shipwreck Act (ASA), the United States asserted title to abandoned shipwrecks that are embedded in the submerged lands of a state, embedded in coralline formations protected by a state on its submerged lands, or on a state's submerged lands and included in or determined to be eligible for listing on the National Register of Historic Places (43 USC 2105(a)). The United States also simultaneously transferred its title to the state government that owns the submerged lands on which the wrecks are located (*Id.* 2105(c)). Therefore, the shipwrecks in the area being considered for designation as a national marine sanctuary in

³² The laws identified here are not intended to provide an exhaustive list of federal and state laws that apply within the area proposed for sanctuary designation.

eastern Lake Ontario and the St. Lawrence River are owned by the state. The United States continues to hold title to wrecks (vessels as well as aircraft) that are entitled to sovereign immunity no matter where they are located. Abandoned shipwrecks that are in or on public lands of the United States continue to be the property of the United States, and any abandoned shipwreck on or in Indian lands is the property of the Indian tribe owning such lands (*Id.* 2105(d)). Although the ASA confers title to most abandoned shipwrecks in state waters to the relevant state, it does not provide long-term comprehensive management of these resources.

Abandoned shipwrecks and their cargo are not to be treated as commodities lost at sea and subject to salvage. The law of finds and the law of salvage (and thus federal Admiralty jurisdiction) no longer applies to abandoned shipwrecks as contemplated in the ASA (43 USC 2106). If they have historical or cultural significance, they can be treated as an archeological or historical site. However, the Act relies on the states to develop appropriate and consistent policies to protect such resources, to guarantee recreational exploration of shipwreck sites, and to allow appropriate public and private sector recovery of shipwrecks consistent with the protection of historical values and environmental integrity of the shipwrecks (*Id.* 2103).

The Act applies to shipwrecks that are “abandoned” and that are “embedded in the submerged lands of a State.” While the term “embedded” is defined in the Act, the term “abandoned” is not, *see* 43 USC 2102, which has led to differing interpretations by the courts and some confusion as to what the state has to show in order to assert ownership.³³

Archaeological Resources Protection Act, 16 USC 470aa, *et seq.*

The purpose of the Archaeological Resources Protection Act (ARPA) is to secure the protection of archeological resources and sites which are on public lands and Indian lands. “Public lands” is defined as lands owned and administered by the United States as part of the national park system, the national wildlife refuge system, or the national forest system, and all other lands the fee title to which is held by the United States, except for those on the outer continental shelf or under the jurisdiction of the Smithsonian (16 USC 470bb(3)(A)). “Indian Lands” means lands of Indian tribes, or Indian individuals, which are either held in trust by the U.S or subject to a restriction against alienation imposed by the U.S. 16 USC 470bb(4). “Archaeological resources” as defined by ARPA are limited to resources that are at least 100 years of age (16 USC 470bb(1)). No person may or may attempt to excavate, remove, damage, or otherwise alter or deface any archeological resource located on public lands or Indian lands unless such activity is pursuant to a permit issued under the Act (16 USC 470ee(a)). ARPA also prohibits the sale, purchase, exchange, transport, or receipt of any archeological resource that was excavated or removed in violation of the Act (16 USC 470ee(b)).

Though significant with respect to the preservation of shipwrecks, this statute does not apply to the wrecks in the area of the proposed sanctuary. The bottomlands, which would comprise the

³³ See, e.g., *Sea Hunt, Inc. v. Unidentified Shipwrecked Vessel or Vessels*, 221 F.3d 634, 641-42 (4th Cir. 2000); *Martha’s Vineyard Scuba Headquarters, Inc. v. Unidentified, Wrecked & Abandoned Steam Vessel*, 833 F.2d 1059, 1065 (1st Cir. 1987); *Treasure Salvors, Inc. v. Unidentified Wrecked & Abandoned Sailing Vessel*, 569 F.2d 330, 336 (5th Cir. 1978); *Klein v. Unidentified Wrecked & Abandoned Sailing Vessel*, 758 F.2d 1511, 1514 (11th Cir. 1985).

proposed LONMS, are not owned by the United States and instead are owned by the state of New York, and are therefore not “public lands” for the purposes of ARPA.

Section 6(c) of the act more generally bans interstate trafficking in archeological resources. It states that no person may sell, purchase, exchange, transport, receive, or offer in interstate and foreign commerce any archeological resource received “in violation of any provision, rule, regulation, ordinance, or permit in effect under state or local law” (16 USC 470ee(c)). Such a prohibition will be covered under NMSA and will not need this separate statutory underpinning. In addition, Section 6(c) only applies in cases where an existing provision of state or local law is violated, which is not the case with NMSA. By contrast, the NMSA makes it unlawful for any person to destroy, cause the loss of, or injure any sanctuary resource managed under the law or regulations for that sanctuary, or to possess, sell, offer for sale, purchase, import, export, deliver, carry, transport, or ship by any means any sanctuary resource taken in violation of the act (16 USC 1436).

The National Historic Preservation Act, as amended, 54 USC 300101 *et seq.*

The National Historic Preservation Act (NHPA) declares it to be the policy of the Federal Government, in cooperation with other nations and in partnership with states, local governments, Indian tribes, and others to use measures, including financial and technical assistance, to foster conditions under which our modern society and our historic property can exist in productive harmony and fulfill the social, economic, and other requirements of present and future generations. It is, moreover, to provide leadership in the preservation of the historic property of the United States, and to assist state and local governments, native peoples, and the National Trust in expanding and accelerating their historic preservation programs and activities. The act established the National Register of Historic Places and provided for the creation of State Historic Preservation Offices (54 USC 302101 *et seq.*). It is the responsibility of the State Historic Preservation Officer to cooperate with federal and state agencies, local governments, and others in conducting and maintaining comprehensive inventories of historic properties and to consult with appropriate federal agencies on the content and sufficiency of any plans developed to protect, manage, reduce or mitigate harm to that property (*Id.* 302301 *et seq.*).

Among the responsibilities of federal agencies under the act is the obligation to assess the effect of any agency undertaking on historic properties. Section 306108 (commonly referred to as section 106) of the act provides that “any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally-assisted undertaking in any State, and the head of any Federal department or independent agency having authority to license any undertaking, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, shall take into account the effect of the undertaking on any historic property.” The federal agency must provide the Advisory Council on Historic Preservation the opportunity to comment on the agency’s undertaking (54 USC 306108). In addition, the NHPA does not apply to activities conducted by private persons not subject to a federal agency license or permit system. As such, the NHPA cannot be relied upon to protect the historic and cultural resources within the proposed designation area because the NHPA does not regulate non-governmental activities directed at such wrecks (e.g., looting, salvage, and treasure-hunting activities) unless

such activities otherwise require some type of federal permit or authorization. The sanctuary would provide for comprehensive protection and management of these historically significant and nonrenewable resources, many of which would otherwise be left unprotected.

Sunken Military Craft Act, 10 USC 113 note

The Sunken Military Craft Act (SMCA) states that the right, title, and interest of the United States to any U.S. sunken military craft cannot be extinguished except by express divestiture and cannot be extinguished by the passage of time. No person may engage in or attempt any activity that disturbs, removes, or injures any sunken military craft unless authorized by permit, by regulations, or otherwise by law. No person may possess, disturb, remove, or injure any sunken military craft in violation of this section or any prohibition, rule, or regulation. This section does not apply to action taken by or at the direction of the United States (Section 1402).

Permits may be issued under the SMCA, pursuant to regulations, allowing a person to engage in a prohibited activity for archeological, historical, or educational purposes. Activities must be consistent with all requirements that apply under any other provision of federal law. The Secretary of the Navy shall consult with each federal agency having authority with respect to the activities. At the request of a foreign state, the Secretary of Navy may carry out this section with respect to any foreign sunken military craft in U.S. waters. The Secretary may seek relief to abate the risk or actual disturbance or injury and to restore the sunken military craft. District courts have jurisdiction. There is an eight-year statute of limitations (Section 1404).

The Law of Finds does not apply to any U.S. sunken military craft wherever located or any foreign military craft located in U.S. waters. No salvage rights will be granted in either case without the permission of the flag state. Nothing prevents the U.S. from pursuing criminal penalties for plundering of wrecks, theft of government property, or violation of any applicable criminal law (Section 1406).

Sunken Military Craft means all or any portion of any sunken warship, naval auxiliary, or other vessel or sunken military aircraft or military spacecraft that was owned by a government when it sank (Section 1408).

The SMCA applies only to submerged military vessels and aircraft, and therefore does not apply to the vast majority of abandoned shipwrecks and craft in the proposed sanctuary.

Coastal Zone Management Act, 16 USC 1451 *et seq.*

The Coastal Zone Management Act (CZMA) declares it to be national policy to protect, develop, preserve for beneficial use and where possible, to restore or enhance, the land and water resources of the nation's coastal zone for this and succeeding generations (16 USC 1451(a)). The coastal zone means coastal waters, including the submerged lands (and the adjacent shore lands), extending seaward to the outer limit of state title and ownership under the Submerged Lands Act. The New York Coastal Management Program, which is administered by the New York State Department of State (DOS), has four Coastal Areas: Long Island, New York City, the Hudson River Valley, and the Great Lakes-St. Lawrence River region. In the Great Lakes, the New York State Coastal Area extends to the international boundary with Canada (*Id.* 1453(1)).

The act helps states develop federally approved coastal zone management programs (CZMPs) to manage and balance competing uses of the coastal zone. Federal actions that may have reasonably foreseeable effects on coastal uses and resources must be consistent with the enforceable policies of a state's approved program. Federal agencies and those performing federal actions, including applicants for federal licenses or permits, must submit a "consistency determination" or "consistency certification" (as applicable) to the potentially affected state to allow consideration of whether the action is consistent with enforceable state coastal policies (16 USC 1456).

A CZMP may, among other things, include enforceable shipwreck management regulations, policies and procedures. However, CZMA does not require states to include shipwreck management regulations or enforceable shipwreck policies in their CZMP. The New York Coastal Management Program does not specifically include shipwrecks in its enforceable policies, although there are several policies that can be used in protecting historical resources. Policy 23 states, "Protect, enhance and restore structures, districts, areas or sites that are of significance in the history, architecture, archeology or culture of the state, its communities, or the Nation." Moreover, CZMA does not apply to activities conducted by private persons unless they are performing federal action (e.g., they are applicants for a federal license or permit). The sanctuary would provide for explicit, comprehensive protection and management of these historically significant and nonrenewable resources.

Antiquities Act, 54 USC 320301 *et seq.*

Under the Antiquities Act, the president may declare by public proclamation historic landmarks, historic or prehistoric structures, and other objects of historic or scientific interest that are situated on land owned or controlled by the federal government to be national monuments (54 USC 320301(a)). The president may reserve parcels of land as part of a national monument (54 USC 320301(b)). When an object is situated on a parcel covered by a bona fide unperfected claim or held in private ownership, the parcel, or so much of the parcel as may be necessary for the proper care and management of the object, may be relinquished to the federal government and the Secretary of the Interior may accept the relinquishment of the parcel on behalf of the federal government (54 USC 320301(c)). There are no national monuments within the area being considered for sanctuary designation.

Vessel Incidental Discharge Act (VIDA), 33 USC 1322(p)

The VIDA, passed by Congress in 2018, amended section 1322 of the Clean Water Act (CWA) by adding a new subsection (p) titled "Uniform National Standards for Discharges Incidental to Normal Operation of Vessels." Subsection (p) required the Environmental Protection Agency (EPA) and the United States Coast Guard (USCG) to develop new regulations for incidental discharges from regulated vessels into waters of the United States and waters of the contiguous zone.

On October 26, 2020, the EPA proposed regulations to establish national standards of performance for vessel incidental discharges into waters of the United States or waters of the contiguous zone (85 FR 67818). EPA's regulations are not yet final. Within two years from the time that EPA's regulations become final, the U.S. Coast Guard is required to develop and

implement regulations. EPA's new requirements will apply once U.S. Coast Guard's regulations take effect. The following **interim requirements** continue to apply until EPA publishes final standards **and** the USCG publishes corresponding implementing regulations (anticipated in 2022):

- **For large commercial vessels (≥ 79 feet in length), except fishing vessels:** The existing vessel discharge requirements established through the EPA 2013 Vessel General Permit (VGP) and the USCG ballast water regulations, and any applicable state and local government requirements.
- **For small vessels (<79 feet in length) and fishing vessels of any size:** The existing discharge requirements for ballast water only established through the EPA 2013 VGP and the USCG ballast water regulations, and any applicable state and local government requirements (<https://www.epa.gov/vessels-marinas-and-ports/vessel-incidental-discharge-act-vida>).

Additionally, EPA's proposed regulations allow states to petition EPA to: 1) issue an emergency order or review any standard of performance, regulation, or policy; 2) establish a proposed standard of performance or requirement with respect to any discharge subject to regulation in the Great Lakes System; 3) establish a state no-discharge zone.

C.2 State Statutes

New York Education Law, NY Educ L 233 (2017)

The New York Education Law provides that “[a]ll scientific specimens and collections, works of art, objects of historical interest and similar property appropriate to a general museum, if owned by the state and not placed in other custody by other specific law, shall constitute the collections of the state museum.” The museum shall be the custodian of the collections and shall perform standard curatorial, research, and educational activities (NY Educ L. 233(1)). The state Commissioner of Education is empowered and directed to promulgate joint regulations and to make agreements with NYSDEC, the Office of General Services (OGS), and the NYSOPRHP relating to the salvage of archaeological or paleontological objects, including ruins, historic sites, burial grounds, buildings, artifacts, fossils, or other objects of antiquity having national significance (*Id.* 233(3)). The New York State Museum generally manages archeological resources on public lands for the benefit of the people of New York.

Historic shipwrecks in New York are protected by Section 233 of the State Education Law, which makes it unlawful for any person to “investigate, excavate, remove, injure, appropriate or destroy any object of archaeological, historical, cultural, social, scientific, or paleontological interest situated on, in or under lands owned by the state of New York without written permission of the commissioner of education” (NY Educ L 233.4). However, the program is largely focused on permitting terrestrial resources, rather than submerged resources. A violation of this prohibition is identified as a Class A misdemeanor, and would thus be of a criminal nature. There are no civil penalties prescribed.

Section 233 of New York's Education Law has a complementary, but significantly distinct, purpose from NMSA. While this section includes a provision that prohibits damage to cultural resources, it is absent equivalent programs for education, interpretation, enforcement, and underwater archaeological research. The state statute is focused on the New York State Museum and its collections procedures; it authorizes the issuance of permits to excavate and gather cultural and historical objects upon the authorization of the New York state commissioner of education. Unless placed in other custody by a specific law, cultural and historical objects salvaged pursuant to such permits become part of the collections of the State Museum. To this end, the issuance of permits pursuant to section 233 of New York's Education Law is for an entirely different purpose than NOAA's management of activities within submerged areas of national significance consistent with the purposes for which a sanctuary is designated. Although section 233(4) of New York's Education Law contains language that at first glance reads comparably to the proposed NOAA prohibition on damaging or altering sanctuary resources, this state law is aimed at ensuring the appropriate acquisition of cultural and historical objects for the state museum's archiving purposes as opposed to preserving *in situ* historic and culturally significant areas within the marine environment.

The complementary nature of the state statute and the proposed NMSA prohibition on damaging or altering sanctuary resources is consistent with how NOAA co-manages sanctuary waters that overlap with state waters. For example, both Thunder Bay National Marine Sanctuary and Wisconsin Shipwreck Coast National Marine Sanctuary include the general sanctuary damage prohibitions that mirror state law in Michigan and Wisconsin, respectively. Sanctuary designation would also allow NOAA to implement targeted regulations to proactively prevent damage to underwater cultural and historical resources from activities that are more likely to injure these resources, such as anchoring and grappling into shipwreck sites, using tethered underwater mobile systems at shipwreck sites, and the trafficking and sale of these resources. These regulations would allow NOAA to target unauthorized activities before damage occurs. In contrast, New York would have to prove injury or destruction to a resource to establish a violation of Sec. 233.

New York state leaders are eager to join with NOAA as a partner to build a program that is focused on actively managing, protecting, and interpreting underwater cultural and historical resources. As co-managers, NOAA and the state would work together to synergize their efforts rather than duplicate management. The resources in the proposed designation area are nationally significant and would benefit from sanctuary designation and the comprehensive management the NMSA provides. New York State currently does not have an underwater archaeologist on staff and does not actively manage or protect shipwrecks in Lake Ontario. New York state agencies have also indicated to NOAA that the implementation of the Section 233 is largely focused on permitting for terrestrial resources, rather than submerged marine resources. The proposed sanctuary would not only enhance existing protections and programs for underwater cultural and historical resources, it would also include additional management and enforcement mechanisms focused specifically on preserving nationally significant marine environments.

Sanctuary designation in the proposed area in Lake Ontario would provide additional enforcement authorities to protect significant cultural and historic resources. A violation of

section 233 of New York's Education Law would be classified as a Class A misdemeanor, which is a criminal offense. Successful criminal prosecutions must satisfy additional procedures and a more scrutinizing burden of proof, among other protections afforded to a criminal defendant. For these reasons, developing a criminal case, as opposed to a civil action, generally requires law enforcement personnel to commit more time and resources to developing and prosecuting a criminal matter. Whereas a criminal prosecutor may review the evidence and exercise their discretion to decline to initiate criminal proceedings, a civil prosecutor might find the same evidence sufficient for purposes of commencing a civil action.

By contrast, NMSA authorizes the assessment of civil administrative penalties, which can provide a more efficient and expeditious deterrent mechanism than criminal sanctions. NMSA is a strict liability statute and does not require proof of a particular culpable mental state to impose an appropriate civil penalty, as is necessary when seeking criminal sanctions. Civil remedies can achieve a sufficient deterrent effect more expeditiously and without allocating substantial agency resources. Civil remedies can also secure more widespread support within the community. When it becomes clear to the community that enforcement can achieve results without prolonged delay, citizens are more likely to cooperate with enforcement personnel in the future. They also have the advantage, through civil remedies or forfeiture, of providing for recovery of costs.

In addition, there are limited mechanisms for detecting violations or responding to reported violations of New York's Section 233 permits. By comparison, the NMSA authorizes NOAA to board, inspect, and search vessels being used to violate the statute, and to seize wherever found any sanctuary resource taken or retained in violation of the statute or its implementing regulations. The sanctuary regulations also authorize criminal penalties for resisting or interfering with an authorized officer or knowingly and willfully submitting false information to an officer. A vessel used in violating any regulation or permit issued under NMSA shall be liable in rem for any penalty assessed for that violation (16 USC 1437). In addition, any person who destroys, causes the loss of, or injures any sanctuary resources will be liable for response costs and damages resulting from such loss (Id. 1443(a)). Education and outreach are also important factors in protecting sanctuary resources as they emphasize sustainable use and encourage public stewardship of the resources.

The sanctuary program would assist state and local governments with implementation and enforcement of their regulations through regulatory and nonregulatory programs that address behavioral change through outreach and education, enforcement, and interpretive enforcement. All of this requires a comprehensive and coordinated agency presence which Congress clearly envisions when it enacted the NMSA.

New York Public Lands Law, NY Pub Lands L 3 and 75

The New York Public Lands Law places the bed of numerous bodies of water, which is held in trust for the people of New York, under the jurisdiction of the Office of General Service (OGS). Structures and utilities, including fill, located in, on, or above state-owned land now or formerly underwater are regulated under the Public Lands Law. OGS has the authority to convey certain property rights, in, on, or above state-owned lands, underwater for the purposes of navigation, commerce, fishing, bathing, recreation, and environmental protection. OGS issues residential

and commercial guidelines for a license, easement, or permit for construction and operation of docks, retaining walls, marinas, etc., on or over state-owned waterbodies. Applications are processed jointly by OGS, DEC, ACOE, and DOS. Easements in lands underwater for conduits, cables, pipelines, fiber lines, and electric lines are conveyed pursuant to Section 3(2) of the Public Lands Law. Easements conveyed pursuant to Section 75(7)(b) of the Public Lands Law are for any structure above or below the water, such as docks, piers, wharfs, breakwaters, shoals, overhangs, and other structures. There is only one such preserve in Lake Ontario, but the State Environmental Quality Review Act (SEQRA), referenced below, necessitates that impacts to underwater preserves be evaluated.

New York State Historic Preservation Act of 1980 (which enacted Article 14 of the Parks, Recreation and Historic Preservation Law)

The New York State Historic Preservation Act declares it to be “the public policy and in the public interest of this State to engage in a comprehensive program of historic preservation” (NY Pks, Rec & Hist Pres L 14.01). It authorizes the Commissioner of Parks, Recreation and Historic Preservation, in consultation with the State Board for Historic Preservation, “to establish the New York State Register of Historic Places, consisting of sites, districts, structures, buildings, areas or objects above or below the surface of the earth whether on land or in the waters of the State, ... significant in the history, architecture, archeology, or culture of the State, its communities or the nation” (Id. 14.07(1)(a)).

The Commissioner of NYSOPRHP is also the State Historic Preservation Officer who administers the National and State Registers of Historic Places. Registered properties and properties determined eligible for listing on the registers receive a measure of protection from the effects of federal and state agency sponsored, licensed, or assisted projects through a notice, review, and consultation process. State agencies are required to consult with the commissioner “if it appears that any project which is being planned may or will cause any change, beneficial or adverse, in the quality of any historic, architectural, archeological or cultural property that is listed on the National Register of Historic Places or property listed on the State Register of Historic Places or that is determined by the commissioner to be eligible for listing on the State Register of Historic Places.” It requires state agencies, to the fullest extent practicable, to avoid or mitigate adverse impacts to such properties, to fully explore all feasible and prudent alternatives and to give due consideration to feasible and prudent plans which would avoid or mitigate adverse impacts to such property, and it establishes agency preservation officers for the purpose of implementing these provisions (9 CRR-NY 426.1 (c)-(e)). There is only one shipwreck in Lake Ontario and the St. Lawrence River that is listed on the National Register of Historic Places, the wreck of the Great Lakes schooner *St. Peter*. *St. Peter* shipwrecked in Lake Ontario in October 1898, and the National Register of Historic Places listed it in 2004.

As with the NHPA, this act provides protection against adverse effects of government activities, not the activities of private entities. Properties listed or eligible for listing in the state and national registers receive a measure of protection from the effects of federal or state agency-sponsored, licensed, or assisted projects through a process of notice, review, and consultation (9 CRR-NY 426.1).

New York Environmental Conservation Law, NY Env Cons L, Article 45, 4 & 8

Article 45 of the New York Environmental Conservation Law provides for the creation of a state Nature and Historical Preserve for the preservation of such “irreplaceable” lands that future generations may share their ecological, educational, and recreational value (NY Env Cons L 45-0101).³⁴ The NYSDEC is authorized to manage and exercise custody and control over lands dedicated pursuant to this article or to contract with any city, county, town, or any state agency for the management, custody, and control of such property. Lands dedicated to the preserve are declared to be put to their highest, best, and most important use, including as places of natural and historical interest and beauty, which provide the public with passive recreational opportunities. The NYSDEC or other state or local agency exercising control over the site shall develop a written stewardship plan for each site. Such plan shall include a description of stewardship activities required to monitor, protect, enhance, and where appropriate actively manage the ecological, scenic, wilderness, geological, or historic resources that merited dedication of the site to the preserve (NY Env Cons L 45-0117(1), (3)(d), (4)).

Article 8 of the New York Environmental Conservation Law is also known as the State Environmental Quality Review Act (SEQRA). It requires that all state and local governments must assess the environmental consequences of all actions they have discretion to approve, fund, or directly undertake. If an action is likely to have significant adverse impacts, an environmental impact statement (EIS) must be prepared to explore ways to avoid or reduce any adverse environmental impacts or to identify potentially less damaging alternatives. Throughout development of the EIS, there are opportunities for the public and for other agencies to provide input to the planning and review process. SEQRA is modeled on the National Environmental Policy Act (NEPA). SEQRA defines the term “Environment” as the physical conditions that will be affected by a proposed action, including “objects of historic or aesthetic significance” (ECL 8-0105(6)). The regulations implementing SEQRA include the term “archeological” significance as well (6 CRR-NY 617.2(l)). Thus, shipwreck sites that have significance in the history, architecture, and culture of the nation and the state are among the resources SEQRA is intended to protect (NYSDEC The SEQRA Handbook, 4th Edition (2020) at 188).

In addition to the articles mentioned above, there are other provisions of the Environmental Conservation Law and its implementing regulations that are not directly related to a national marine sanctuary but could potentially apply.

³⁴ Under Article XIV of the New York State Constitution, the state legislature was directed to provide for the acquisition of lands and waters, including improvements thereon and any interests therein, which because of their natural beauty, wilderness character, or geological, ecological, or historical significance, shall be preserved and administered for the use and enjoyment of the people. Properties so dedicated shall constitute “the state nature and historical preserve,” and they shall not be taken or otherwise disposed of except by law enacted by two successive regular sessions of the legislature.

New York Executive Law, NY Exec L, Article 42

The Waterfront Revitalization of Coastal Areas and Inland Waterways law is one of the main instruments for implementing the 44 coastal policies of the New York State Coastal Management Program. It declares New York's coastal area and coastal waters to be unique with a variety of natural, recreational, industrial, commercial, ecological, cultural, aesthetic, and energy resources of statewide and national significance and to be increasingly subject to the pressures of population growth and economic development (NY Exec L 910). It was the intention of the legislature to provide coordinated and comprehensive policy and planning for the preservation, enhancement, protection, development, and use of New York's coastal and inland waterway resources. "Coastal waters" is defined to include Lakes Erie and Ontario, as well as the St. Lawrence River and Niagara River (*Id.* 911(1), (3)). The New York Secretary of State is directed to advise the governor and state agencies concerning planning, programs, and policies for the achievement of wise use of water resources of coastal areas and inland waterways giving full consideration to ecological, cultural, historic, and aesthetic values; to evaluate and make recommendations on federal, state, and local programs relating to coastal and inland waterways; and to adopt such rules and regulations as may be necessary and convenient (*Id.* 913(1), (2), (6)).

It is the intention of this article to offer the fullest possible support by the state and its agencies to those local governments that desire to revitalize their waterfronts. The New York Secretary of State may provide technical and financial assistance to such local government or governments and shall prepare and distribute guidelines for such local governments (*Id.* 915). The local government shall include in its Local Waterfront Revitalization Program (LWRP) the boundaries of the waterfront area; an inventory of natural and historic resources to be protected; a statement of the goals and objectives of the program; identification of the uses and projects to be accommodated in the area; a description of the proposed means of long-term management and maintenance/ and a description of the necessary and appropriate state actions for successful implementation of the program (*Id.*). The New York State Coastal Management Program incorporates the requirements of this section (*Id.* 921).

Appendix D: Response to Comments

NOAA consolidated public comments from the draft EIS and NPRM and collectively responds to those comments in the final rule and here in the final EIS. For the purposes of managing responses to public comments, NOAA grouped similar comments by theme. These themes align with the content of the proposed rule and EIS that identified the purposes and needs for a national marine sanctuary, and the draft management plan that identified the proposed non-regulatory programs and sanctuary operations. They are summarized below, followed by NOAA's response.

Support and Opposition of the National Marine Sanctuary

1. **Comment:** Commenters cited several reasons for supporting sanctuary designation, including: long-term protection for nationally significant shipwrecks; increased accessibility to these shipwrecks; additional recreational opportunities; potential for national recognition of the area to support local tourism and economies; federal resources to support research on shipwrecks; establishing a mooring program; and potential educational opportunities for students to study cultural and biological resources in the lake. Local and state governments and organizations also expressed strong support of the sanctuary, offering opportunities to partner for education, research, outreach, and other activities. The state of New York agencies expressed commitment to be key partners in co-management and implementation of the national marine sanctuary.

Response: NOAA agrees that these are some of the main benefits of designating LONMS. NOAA has considered these comments in writing the final EIS, management plan, and final rule. The management plan identifies actions to support these goals.

2. **Comment:** NOAA received comments that opposed designating a sanctuary, citing reasons including: enough state and federal protections for sensitive historic underwater resources already exist; concern that there is not enough public interest in local shipwrecks; most of the wrecks have already been found by private explorers and, thus, NOAA research is not needed; and the level of economic development would not be high enough to justify the creation of a national marine sanctuary.

Response: NOAA determined that this action responds to the need to provide additional protection and management of nationally significant underwater cultural and historical resources in eastern Lake Ontario. NOAA determined the current jurisdictional regime does not provide comprehensive and effective management for the full range of activities that impact the underwater cultural and historical resources in the region. Chapter 2 of the final EIS describes the purpose and need for this sanctuary. The LONMS Management Plan describes a wide variety of activities that will be implemented if this is designated a national marine sanctuary.

3. **Comment:** Some commenters expressed conditional support for a sanctuary as long as legal fishing, hunting, and fur trapping activities are not limited by the sanctuary.

Response: NOAA's goal of establishing a national marine sanctuary in eastern Lake Ontario is to comprehensively manage the underwater cultural resources in the area. NOAA's regulations will not limit legal fishing, hunting, or fur trapping within the boundaries of the sanctuary, as long as those activities do not damage or disturb sanctuary resources.

4. **Comment:** NOAA received a few comments questioning why the sanctuary should be established if there are only a few diveable shipwrecks in the proposed boundaries.

Response: As demonstrated across the National Marine Sanctuary System, the public will benefit both from activities occurring within LONMS and activities occurring on land. People will be able to enjoy the sanctuary through diving, kayaking, boating, and snorkeling, as well as through museums, interpretive displays, websites, formal and informal educational programs, enhanced tourism opportunities, multidisciplinary research opportunities, and other unique sanctuary-related partnerships and activities. The LONMS Management Plan outlines priorities in these areas for the first five years of the sanctuary's operation with the goal of providing benefits to a broad range of public uses and users.

5. **Comment:** NOAA received a few comments stating that federal funding of a national marine sanctuary would be a waste of federal funds.

Response: NOAA has determined this action responds to the need and opportunity to provide additional protection and management of nationally significant underwater cultural and historical resources in eastern Lake Ontario. NOAA has received consistent support for this sanctuary designation from the local communities and the state of New York. NOAA prepared a draft management plan with significant input from the Lake Ontario Sanctuary Advisory Council, who are local community members. NOAA describes the benefits of this sanctuary in Chapter 2 of the final EIS and will spend federal funds prudently to accomplish the goals of the sanctuary.

6. **Comment:** NOAA received a comment questioning whether NOAA has the ability to enforce sanctuary regulations in such a large area.

Response: Law enforcement authorities within NOAA and the state of New York will coordinate to ensure that sanctuary regulations are enforced. NOAA and the state of New York intend to examine their existing joint enforcement agreement to consider opportunities for state personnel to assist in the enforcement of national marine sanctuary regulations. NOAA also intends to coordinate with the U.S. Coast Guard to ensure compliance with the NMSA and sanctuary regulations.

7. **Comment:** One commenter expressed concern about advertising the area to scuba divers when several of the wrecks in the sanctuary lie outside of recreational dive limits (over 130 feet of water). Commenters were also concerned about safety issues arising

from increased diving activity in the St. Lawrence River if it was included in the sanctuary, due to the proximity of several of the wrecks to shipping channels.

Response: NOAA notes that it is safest for divers to only dive within the scope of an individual's personal training, experience, and comfort level. While it is true that a number of shipwrecks within the boundaries lie in over 130 feet of water and are only accessible to technical divers, there are also several sites that lie in shallower waters and are more easily accessible to recreational divers. The LONMS Management Plan includes actions that support these goals. NOAA will prioritize placing mooring buoys at these popular dive sites in the sanctuary to provide safer access to the wrecks, as well as to reduce ongoing impacts to those sites from visitor traffic (Strategy RP-1 in the LONMS Management Plan). NOAA does not plan on installing mooring buoys at all shipwreck sites, nor encouraging diving at all sites. When evaluating sites for mooring buoys, NOAA will consider the impact to the shipwreck, the safety conditions of accessing the site, the depth of the site, and the cost of installing and maintaining the buoy. NOAA will also publish shipwreck site plans to aid divers in planning their dives. NOAA has a strong track record of working with local dive shops to educate business owners and their clients about safe diving practices for both human safety and protection of dive sites. NOAA will also work with local emergency responders to ensure they are prepared for responding to dive emergencies. Finally, the LONMS boundaries will not include the St. Lawrence River.

8. **Comment:** NOAA received a comment expressing concern that improving access to shipwrecks for scuba divers would increase the degradation of the resources that NOAA is trying to protect.

Response: It is the responsibility of and highest priority for NOAA to protect the integrity of sanctuary resources. NOAA will utilize a range of management actions to ensure that sanctuary resources are not degraded as a result of a sanctuary designation. These actions include implementing regulations tailored to protect sanctuary resources from disturbance; installing a network of mooring buoys that provide safe ascent lines for divers and eliminates the practice of anchoring or grappling into shipwrecks to access the site; publishing and distributing site plans and best practices for wreck diving; and increasing the enforcement presence in the area. In order to assess changes to the resource's stability over time, NOAA will develop and implement a monitoring program for underwater cultural resources in the sanctuary. NOAA can also protect sensitive sites and newly discovered sites by withholding the coordinates of shipwrecks that it believes are sensitive or need evaluation and documentation.

NOAA believes that increasing public access and tourism to shipwreck sites is an important way to foster awareness, appreciation, and, ultimately, the protection of these special places. While NOAA expects tourism, including dive tourism, to increase in Lake Ontario after sanctuary designation, we do not anticipate a major increase in diving due to the great depth of many of the wrecks and the somewhat low level of diving activity in the Great Lakes in general. As discussed above, implementing the

sanctuary regulations, mooring program, permitting system, and increasing enforcement in the sanctuary will minimize any direct impacts to the shipwrecks. Similarly, the final management plan includes education and outreach efforts that will promote responsible diving practices and increase public appreciation and stewardship of these sanctuary resources. Overall, NOAA determined that any adverse impacts on underwater cultural resources from designating the sanctuary would be negligible (refer to Sections 5.3.1 and 5.4.1 of the final EIS for more information).

Sanctuary Boundary

9. **Comment:** NOAA received several comments on the two boundary alternatives in the draft EIS and on the proposed boundary in the NPRM. With regard to the size of the boundary, NOAA received several comments supporting inclusion of the Thousand Islands region of the St. Lawrence River in the sanctuary's boundary. NOAA also received several comments that were opposed to the inclusion of this area of the St. Lawrence River. In raising concerns about the St. Lawrence River, some commenters noted that sanctuary designation could potentially lead to an increased number of divers and other recreational users in the St. Lawrence Seaway shipping channel, which they believed could present safety and navigational challenges. Commenters noted that the St. Lawrence River is managed jointly with Canada, has high shipping traffic in narrow shipping channels, has unpredictable weather, and has several islands and other obstacles in the river that present navigational challenges. Commenters were also concerned that if NOAA were to install surface mooring buoys in navigation channels this would create a navigation hazard for vessels.

Response: After evaluating public comments, NOAA did not include the St. Lawrence River segment within the sanctuary boundary. After considering public comments, NOAA has made a minor change to the eastward end of the sanctuary boundary by moving the boundary from Market Street in Cape Vincent to Tibbetts Point Lighthouse to ensure the sanctuary will not be in the St. Lawrence River. As the St. Lawrence River is critical to the maritime history of the area, NOAA will still include the story of the area in its interpretive materials and work with partners in this area. In addition, NOAA added *Strategy RP-6: Evaluate opportunities to consider future sanctuary expansion to include the Thousand Islands region of the St. Lawrence River* to the management plan, as there was considerable support for this area being included in the boundary.

10. **Comment:** NOAA received several comments asking NOAA to clarify which ports, harbors, and marinas are excluded from the sanctuary.

Response: NOAA is excluding the ports and harbors of Oswego, Pultneyville, Little Sodus Bay, Sodus Bay, and Port Ontario from the sanctuary boundary to ensure compatible use with commercial shipping and other activities, such as maintenance dredging. NOAA will also exclude privately owned bottomlands from the sanctuary. NOAA is including Sackets Harbor in the sanctuary because of the possible presence of underwater cultural and historical resources at that location.

In addition, the boundary of LONMS cuts across the mouths of rivers, streams, creeks, and ponds as it continues along the coastline of the sanctuary, which excludes those water bodies from the sanctuary. This is the case for East Bay, Port Bay, Blind Sodus Bay, North Pond, South Colwell Pond, Goose Pond, Floodwood Pond, and Black Pond. Therefore, these bays and their channels to the lake will not be included within the boundaries of the sanctuary. Please refer to Section III C. in the final rule for more information.

- 11. Comment:** NOAA received two comments seeking clarification of which water level datum will be used for the shoreline and how the shoreline boundary will be affected by fluctuating water levels.

Response: For the Lake Ontario shoreline, NOAA will set the shoreline sanctuary boundary at the Low Water Datum (LWD). The LWD is determined by the U.S. Army Corps of Engineers and is the chart datum to which soundings are referenced for NOAA charts in the Great Lakes. The LWD is also well understood internationally because it is a fixed datum for each lake relative to the International Great Lakes Datum. The sanctuary shoreline boundary will therefore automatically reflect any changes to either the Low Water Datum or the International Great Lakes Datum. As the LWD is set at a fixed elevation, the sanctuary boundary line is not affected by water levels in the lake.

- 12. Comment:** NOAA received a few comments that certain areas important to commercial shipping, including current and future federal anchorage areas, Recommended Courses,³⁵ and current and future dredged material disposal areas, should be excluded from the sanctuary. NOAA received one question about how sanctuary designation would affect Port Bay, New York's status as a safe harbor.

Response: NOAA will exclude the federal navigation channel approaches and federal anchorage area from the sanctuary to avoid unintended effects on port operations critical to the local, regional, and national economies. While NOAA initially excluded open lake dredged material disposal areas in the draft EIS, after further internal analysis and consultations with the U.S. Army Corps of Engineers and the state of New York, NOAA is not excluding open lake dredged material disposal areas from the sanctuary boundary. Excluding these areas would create unwanted "holes" in the sanctuary boundary, which can create confusion for the public about the exact location of sanctuary boundaries. In addition, there is one active open lake dredged material disposal area in the sanctuary boundary, off the Port of Oswego, which has been in use since the late 1980s. The New York State Historic Preservation Officer verified that there are no known underwater cultural resources in that area. Therefore, dredged material disposal could continue in that area without violating NOAA's prohibitions, and sanctuary designation will not affect management of that area. NOAA will also have the authority to certify existing leases, permits, licenses, or rights of subsistence use or access in existence on the date of designation of the sanctuary. Therefore,

³⁵ <https://lcaships.com/wp-content/uploads/2022/02/LCA-CMC-Recommended-Courses-Rev.-to-December-2021.pdf>

existing dredged material disposal activities may be certified upon sanctuary designation if properly requested by the holder of the lease, permit, license, or right of subsistence use or access in question, if such activities would otherwise be in violation of sanctuary regulations. NOAA cannot exclude future dredged material disposal areas from the physical boundaries of the sanctuary, as they do not exist at this time.

NOAA has decided not to exclude Recommended Courses from the sanctuary, because they are voluntary courses and neither normal nor emergency transit activities occurring in these routes are expected to violate sanctuary prohibitions. NOAA will consider Recommended Courses when determining where to place mooring buoys and to ensure that any diving activity would be conducted at a safe distance from these courses. NOAA will exclude the existing federal anchorage area from the sanctuary boundary (Tibbetts Point Anchorage Area). NOAA is not responsible for establishing new federal anchorage areas and has not excluded a federal anchorage area off of the Port of Oswego as suggested, as none exist at this time. Port Bay's status as a Safe Harbor would not be affected by the sanctuary designation.

Definitions and Scope of Regulations

- 13. Comment:** NOAA received one comment supporting NOAA's proposal to require users to obtain a special use permit from NOAA to operate tethered underwater mobile systems at shipwreck sites. One commenter stated that operating tethered underwater mobile systems do not pose a threat to shipwreck sites in Lake Ontario.

Response: NOAA is moving forward with requiring operators to obtain a permit to operate tethered underwater mobile systems at shipwreck sites. A new special use permit category for "the operation of tethered underwater mobile systems at shipwreck sites within Lake Ontario National Marine Sanctuary" could apply when the proposed activity does not qualify for a general permit or authorization under the LONMS regulations, and the proposed activity otherwise satisfies the requirements in the applicable sanctuary regulations and section 310 of the NMSA. NOAA disagrees that remotely operated vehicle tethers do not pose a threat to shipwrecks. NOAA has included additional language in Section III E.4. in the final rule to explain why tethered vehicles pose several threats to shipwreck sites, including intentional site disturbance, incidental site disturbance, and site pollution. The impact from such activities can result in damage to artifact assemblages and the structural integrity of a site. This risk is particularly concerning in the sanctuary area, as a large number of shipwrecks have intact masts and high site integrity.

- 14. Comment:** NOAA received a few comments suggesting that the proposed NOAA regulations are duplicative of the state of New York's regulations that protect underwater cultural and historical resources.

Response: NOAA's prohibition on damage to underwater cultural and historical resources will complement and supplement the state's prohibition by adding an additional layer of Federal protection for those resources. Section 233(4) of New York's Education Law focuses on the New York State Museum and its collections procedures,

and it authorizes the issuance of permits to excavate and gather cultural and historical objects upon the authorization of the state of New York commissioner of education. This state law is aimed at ensuring the appropriate acquisition of cultural and historical objects for the State Museum's archiving purposes, while NOAA's regulation is intended to preserve *in situ* historic and culturally significant areas within the marine environment. In addition, the New York Education Law does not include equivalent programs to NOAA's for underwater archaeological research, education, interpretation, and enforcement, and NOAA's other regulations are designed to specifically address identified threats to underwater cultural and historical resources within LONMS. National marine sanctuary designation allows NOAA to utilize its federal assets and enforcement capabilities to actively manage, protect, and interpret underwater cultural and historical resources in Lake Ontario. Refer to final EIS Appendix C: Analysis of Relevant Federal and State Statutes for more information on how the regulations complement and supplement state and federal regulations and fill legal gaps.

- 15. Comment:** NOAA received one comment that stated that the definition of “sanctuary resource” in the proposed rule was too broad and suggested that NOAA should use the programmatic definition of sanctuary resource under 15 CFR 922.11. The commenter said that by including the word “object” in the definition, that anything could be included, even on the shore. Another comment on the draft EIS stated that it was unclear what NOAA was using for the definition of “shipwreck.”

Response: In the draft EIS, NOAA proposed regulatory concepts, including suggested definitions. In the NPRM, NOAA used those concepts and created proposed regulatory definitions in the LONMS regulations for “sanctuary resource” and “shipwreck site” to include only the historical resources found in this area in accordance with the purpose of this designation. This definition of sanctuary resource does not include biological and ecological resources. For the purposes of LONMS, “sanctuary resource” means all historical resources as defined at 15 CFR 922.11, which includes any pre-contact and historic sites, structures, districts, objects, and shipwreck sites within the sanctuary's boundaries. NOAA's definition refers back to the programmatic definition of “historical resource” in 15 CFR 922.11, which does include the word “object,” but only objects that possess historical, cultural, archaeological, or paleontological significance are included in this definition. The NPRM also proposed defining “shipwreck site” to mean all archaeological and material remains associated with sunken watercraft or aircraft that are historical resources, including associated components, cargo, contents, artifacts, or debris fields that may be exposed or buried within the lakebed. NOAA believes its definition is clear, and did not receive additional comments on the definition of “shipwreck site” after the NPRM was published. Therefore, NOAA is moving forward with this definition in this final rule. These definitions only apply to resources within the LONMS sanctuary boundaries, which start below the low water datum on the shoreline.

- 16. Comment:** NOAA received several comments that the prohibition on anchoring could be problematic for commercial vessels and that NOAA should publish both the known and potential locations of shipwrecks sites. A related comment noted that if the no-anchoring prohibition extends to undiscovered shipwrecks, shippers might not be able to avoid anchoring on a shipwreck if they do not know where it is. Therefore, all locations, known or approximated, should be published by NOAA in a format accessible and useful to all mariners.

Response: Anchoring within the sanctuary is not prohibited in LONMS. However, grappling into or anchoring on a shipwreck site is prohibited. NOAA has narrowly worded this regulation to protect historic shipwrecks and aircraft from anchor damage, while still allowing anchoring inside of the sanctuary and outside of these discrete areas. The prohibition does not apply to any activity necessary to respond to an emergency threatening life or the environment. In addition, existing state regulations already prohibit damaging historic shipwreck sites within the area. To help vessels avoid anchoring on known shipwrecks sites, NOAA intends to publish known shipwreck site coordinates on the [LONMS website](#).

- 17. Comment:** NOAA received some comments that expressed concern that, as written, the prohibition on grappling into or anchoring on shipwreck sites would prohibitively limit diver access to shipwreck sites without providing an alternative means of access. Comments suggested amending the proposed prohibition on grappling into or anchoring on shipwreck sites to say that grappling into or anchoring on shipwreck sites is prohibited at sites where mooring buoys have been installed.

Response: As NOAA seeks to promote public access while also ensuring sound resource protection, an initial focus of the sanctuary management plan will be the installation of mooring systems at sanctuary shipwreck sites. Moorings provide a secure and convenient anchoring point for users, which eliminates the practice of grappling into or anchoring on shipwrecks to access the site. NOAA also intends to publish guidelines on best practices for anchoring near shipwreck sites both with and without moorings to avoid injuring sanctuary resources. For example, NOAA intends to publish instructions for the public on how to use a weighted line and surface float at sites without moorings to mark a wreck for divers to descend and ascend. This weighted line would not be used as an anchoring line, and it would need to be continuously tended and then completely removed before the dive boat leaves the area.

NOAA is delaying implementation of the prohibition of grappling into or anchoring on shipwreck sites by two years rather than amending the prohibition as suggested by the commenters. This delayed implementation is intended to provide NOAA with adequate time to develop a shipwreck mooring program in consultation with the dive community and state and federal agencies; begin installing moorings at high priority shipwreck sites; and publish site plans and best practices for accessing shipwreck sites with and without moorings. After this two-year period, NOAA will continue to build out a mooring buoy program as funds become available. During this two-year period, all other statutory and regulatory provisions will be in effect from the effective date of

designation, including the prohibition on altering, destroying, or otherwise injuring any sanctuary resource (including shipwrecks) under 15 CFR 922.223(a)(1). It also continues to be a violation of state law to damage shipwrecks, including damage from anchoring or grappling.

- 18. Comment:** NOAA received a few comments requesting that sanctuary regulations protect natural and biological resources in the Great Lakes ecosystem. Commenters suggested regulations to prevent wastewater discharges, discharge of mercury and other toxic materials, risks from aging infrastructure, spread of invasive species, and other risks to wildlife and habitat.

Response: This is beyond the scope of the purpose and need for this action, which is focused on the protection, management, and interpretation of underwater cultural and historical resources.

- 19. Comment:** NOAA received several comments asking for clarification on how the sanctuary would affect dredging in the area.

Response: The sanctuary prohibitions seek to ensure that any activity carried out within sanctuary boundaries does not negatively impact underwater cultural resources. Dredging, pier construction and maintenance, and other construction activities are not expressly prohibited activities under the regulations. However, should the performance of any of these activities violate, for example, the sanctuary prohibition on “moving, removing, recovering, altering, destroying, possessing, or otherwise injuring” a sanctuary resource, it would be prohibited under those circumstances. Therefore, if dredging activities would not otherwise violate a sanctuary prohibition, they may occur within the sanctuary without a permit from NOAA.

Dredging activities in eastern Lake Ontario are regulated by the state of New York and the U.S. Army Corps of Engineers. Consideration of impacts to cultural resources should already be incorporated into the permit review processes for both the state and the U.S. Army Corps of Engineers because they both have legal requirements to minimize damage to cultural resources. NOAA would only be involved in those permitting processes if it is determined that underwater cultural and historical resources within the sanctuary may be impacted. NOAA, through its co-management arrangement with the State and through the consultation requirement for federal agencies under the NMSA Section 304(d), will coordinate its involvement, including potential permitting, authorization, and consultation under Section 106 of the National Historic Preservation Act, when underwater cultural and historical resources may be impacted (see Section III I.3. in the final rule for more information about authorizations).

NOAA recognizes that inlet dredging may extend into the sanctuary boundary. However, as indicated above, this dredging would only be prohibited by the sanctuary regulations and require a permit from NOAA if it is determined that underwater cultural and historical resources within the sanctuary may be impacted.

- 20. Comment:** NOAA received comments asking whether the sanctuary would create any additional restrictions or regulatory requirements related to pier structure maintenance, pier construction, and shoreside construction.

Response: The shoreline boundary line for the sanctuary is set at the low water datum along the lakeshore. Any activities conducted above this line will be outside of the sanctuary and not subject to NOAA's jurisdiction. The LONMS regulations are narrowly focused on protecting underwater cultural and historical resources. Pier construction and other construction activities are not expressly prohibited activities under the regulations. However, should the performance of any of these activities violate, for example, the sanctuary prohibition on "moving, removing, recovering, altering, destroying, possessing, or otherwise injuring" a sanctuary resource, it would be prohibited under those circumstances. Therefore, if constructing a dock or pier would not otherwise violate a sanctuary prohibition, it may occur within the sanctuary. These types of activities are regulated by state and other federal entities, and therefore, consideration of the impact to cultural resources should already be incorporated into the applicable permit review processes.

- 21. Comment:** NOAA received a comment from Region 2 of the U.S. Environmental Protection Agency (EPA) that NOAA should address projected climate change effects in the region, greenhouse gasses, and land-based infrastructure impacts in the final EIS.

Response: NOAA considers climate management an agency priority, and therefore has incorporated a discussion of climate change impacts in the Great Lakes and potential negligible greenhouse gas emissions from its management activities into the final EIS (see final EIS sections 4.4.1.2, 5.3.3, 5.4.3). NOAA has not identified any specific construction projects associated with sanctuary designation at this time, and therefore has not evaluated the environmental impacts for facility construction or operation as part of the action. Based on a facilities assessment, NOAA may choose to rent space in existing facilities rather than constructing new facilities. NOAA will evaluate the environmental impacts and consider environmentally responsible practices suggested in EPA's recommendations for infrastructure projects on a project-by-project basis.

- 22. Comment:** NOAA received several comments about how the sanctuary would impact Great Lakes wind development in Lake Ontario.

Response: NOAA is not aware of any current Great Lakes wind energy projects in the area. All proposed energy generation and transmission projects are subject to rigorous federal and state review to minimize or avoid impacts to historic resources, including shipwrecks. NOAA will work with the relevant authorities, including the state of New York, to ensure that any proposed wind turbines and supporting infrastructure would be properly sited to avoid negative impacts to underwater cultural resources within the sanctuary.

Management Plan, Sanctuary Name, Operations

- 23. Comment:** NOAA received a number of suggestions during the public comment period regarding naming the national marine sanctuary in Lake Ontario, including: Lake Ontario National Marine Sanctuary, Eastern Lake Ontario National Marine Sanctuary, Shining Waters National Marine Sanctuary, Great Lake Ontario National Marine Sanctuary, Great Lake Ontario - Thousand Islands National Marine Sanctuary, Gateway to the West National Marine Sanctuary, Gateway National Marine Sanctuary, and Carr National Marine Sanctuary.

Response: NOAA has decided to keep the name of the sanctuary as Lake Ontario National Marine Sanctuary. This decision was based on public comment, input from the Lake Ontario Sanctuary Advisory Council, and consultation with the state of New York, Indigenous nations and tribes, and local governments.

- 24. Comment:** NOAA received several comments encouraging NOAA to invest in visitor centers and other facilities for people to learn about the sanctuary, the history of the area, and Lake Ontario. Commenters identified Huron, New York; Wayne County, New York; the eastern shore; Henderson, New York; Sackets Harbor; Sodus Point, New York as places to consider for interpretive facilities.

Response: NOAA agrees that facilities adjacent to the sanctuary are essential to its efforts to introduce the public to the sanctuary and to educate visitors about the significance of the area. Per the management plan Strategy SO-2, NOAA will conduct an infrastructure needs assessment to develop a “NOAA presence” in the sanctuary communities. The assessment will evaluate how NOAA and its partners can support the sanctuary’s mission to provide a range of experiences to the public and then work with local communities, the state of New York, the Lake Ontario National Marine Sanctuary Advisory Council, and other appropriate partners to implement these plans.

- 25. Comment:** NOAA received comments on the draft management plan that supported certain activities and suggested specific other ideas for education, research, and interpretation activities for the sanctuary.

Response: NOAA made revisions to the final management plan to add several new activities and clarify the intent of some of the existing activities. NOAA expanded some of the education activities to include working with partners on digital immersive experiences and other outreach opportunities; including partners to help determine the level of and type of visitor uses; and using side scan multi-beam sonar to map sanctuary resources. NOAA also added several new activities to address climate change, including integrating emissions reductions into sanctuary operations, considering how resource protection and management may need to evolve, and expanding education and outreach to include what climate change impacts in the Great Lakes and possible impacts to sanctuary resources. NOAA also added a new introduction to provide more background information about the sanctuary, the purpose of the management plan, and roles for NOAA, the state of New York, and the Lake Ontario National Marine Sanctuary Advisory Council.

Engagement with Indigenous Communities

- 26. Comment:** NOAA received a few comments on the importance of acknowledging the Haudenosaunee Confederacy’s ancestral homelands along Lake Ontario and involving the Haudenosaunee Confederacy Nations and Tribes in the interpretation of the proposed sanctuary.

Response: From the initiation of the designation process, NOAA has reached out to the seven federally recognized Indigenous nations and tribes in the state of New York that have connections to Lake Ontario. NOAA has engaged with the Onondaga Nation in government-to-government consultation throughout the designation process and has had meetings with the Seneca Nation. After designation, NOAA intends to continue to work in collaboration with the Indigenous nations and tribes to incorporate Indigenous history into sanctuary educational and outreach materials (including interpretive exhibits) and to collaborate on research regarding potential historic Indigenous resources in the area. Please refer to Section V.E. in the final rule for more information on government-to-government consultation.

Comments on Known Shipwrecks and Identified Threats to Sanctuary Resources

- 27. Comment:** NOAA received comments regarding the accuracy of information on the list of shipwrecks and suggestions that NOAA add dates for historical events.

Response: NOAA researchers corroborated the edits suggested in these comments and NOAA has made corrections to the list of known shipwrecks in the final EIS. NOAA intends to continue to refine and update the shipwreck inventory over time as more information becomes available.

- 28. Comment:** NOAA received comments on its list of identified threats in the draft EIS and the proposed rulemaking, including suggestions of additional threats (e.g., fishing equipment, such as downriggers), and skepticism about NOAA’s ability to address impacts to the shipwrecks from natural threats identified in the draft EIS and NPRM.

Response: NOAA included entanglement of “fishing equipment” as a threat to underwater cultural and historical resources in both the draft EIS and NPRM. NOAA has added downriggers as a specific example of fishing equipment in the final EIS and final rulemaking in response to commenters who noted damage to shipwrecks from this type of fishing equipment. NOAA also added two actions to the management plan (activities RP 3.1 and 3.2) to assess the amount and type of marine debris, including fishing gear, found on sanctuary resources and to remove debris from the sanctuary.

NOAA included natural processes in the list of identified threats to explain that the long-term integrity of underwater cultural resources is affected by numerous factors. NOAA does not claim to be able to prevent some of these natural processes from occurring. Rather, acknowledging these processes provides context for the state of underwater cultural and historical resources, and NOAA will document and monitor

the progress of these processes to inform research and management decisions. For example, while the establishment of a sanctuary cannot prevent climate change, it allows NOAA to monitor and document the effects of climate change on the deterioration rates of wooden shipwrecks in freshwater, which is important information for the scientific and archaeological community. The final management plan includes actions that support this goal.

Appendix E: List of Document Preparers

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NATIONAL MARINE
SANCTUARIES

AMERICA'S UNDERWATER TREASURES