



Thunder Bay National Marine Sanctuary



Final Environmental Impact Statement: Boundary Expansion



August 2014
U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Ocean Service
Office of National Marine Sanctuaries

Cover Sheet

Thunder Bay National Marine Sanctuary Boundary Expansion FINAL ENVIRONMENTAL IMPACT STATEMENT

Proposed Action: NOAA's Office of National Marine Sanctuaries proposes to expand the boundary of Thunder Bay National Marine Sanctuary, located in the waters of the state of Michigan in Lake Huron.

Type of Statement: Final Environmental Impact Statement

Lead Agency: NOAA Office of National Marine Sanctuaries

For Further

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Abstract: NOAA's Office of National Marine Sanctuaries proposes to expand the boundary of Thunder Bay National Marine Sanctuary from 448 square miles to 4,300 square miles and extend protection to 47 additional known historic shipwrecks of national significance. NOAA prepared this FEIS in accordance with the National Environmental Policy Act of 1969 (NEPA; 42 USC 4321 et seq.) as implemented by the Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and NOAA Administrative Order (NAO) 216-6, which describes NOAA policies, requirements, and procedures for implementing NEPA. The FEIS also fulfills the mandate of the National Marine Sanctuaries Act (NMSA; 16 U.S.C. 1434(a)(4)), which requires that "terms of designation may be modified only by the same procedures by which the original designation is made."



Dear Reviewer:

In accordance with provisions of the National Environmental Policy Act of 1969 (NEPA), we enclose for your review the National Oceanic and Atmospheric Administration (NOAA), Office of National Marine Sanctuaries (ONMS), Final Environmental Impact Statement (FEIS) for the Boundary Expansion of Thunder Bay National Marine Sanctuary (TBNMS or sanctuary). Located in northwestern Lake Huron, Thunder Bay is adjacent to one of the most treacherous stretches of water within the Great Lakes system. Fire, ice, collisions, and storms have claimed nearly 200 vessels in and around Thunder Bay. Today, TBNMS protects one of America's best-preserved and nationally-significant collections of shipwrecks.

This FEIS assesses the environmental and socio-economic impacts of the expansion of TBNMS and is prepared pursuant to the requirements of the National Marine Sanctuaries Act (NMSA) and NEPA. Sanctuary expansion requires changes to the boundary description in the terms of designation for the sanctuary. The NMSA requires that an EIS be prepared for changes to terms of designation, regardless of the significance of the impacts of the proposed action. The final rule would establish new boundaries for TBNMS.

Although NOAA is not required to respond to comments received as a result of issuance of the FEIS, any comments received will be reviewed and considered for their impact on issuance of a record of decision (ROD). Please send comments to the Sanctuary Official identified below by September 1, 2014. The ROD will be made available publicly following final agency action after September 1, 2014.

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Sincerely,

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Patricia A. Montanio
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Enclosure



About this Document

This final environmental impact statement (FEIS) provides detailed information and analysis of a range of reasonable alternatives for a boundary expansion in the Thunder Bay National Marine Sanctuary, including location and regulation of various human uses in that area.

The National Oceanic and Atmospheric Administration (NOAA) prepared this FEIS in accordance with the National Environmental Policy Act of 1969 (NEPA; 42 USC 4321 *et seq.*) as implemented by the Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and NOAA Administrative Order (NAO) 216-6, which describes NOAA policies, requirements, and procedures for implementing NEPA. The FEIS also fulfills the mandate of the National Marine Sanctuaries Act (NMSA; 16 U.S.C. 1434(a)(4)), which requires that “terms of designation may be modified only by the same procedures by which the original designation is made.”

Accordingly, this document was preceded by a Notice of Intent to prepare a draft environmental impact statement (DEIS) and carry out a public scoping process (77 FR 21878; April 12, 2012) and by a DEIS (78 FR 35928; June 14, 2013). The public scoping period commenced in April and ended on May 25, 2012, during which time public meetings were held and NOAA received both written and oral comments on the concept of expanding the boundaries of the sanctuary. The public also was provided an opportunity to comment on the DEIS from June 14 to December 19, 2013. NOAA is the lead agency for this action. NOAA’s Office of National Marine Sanctuaries (ONMS) is the implementing office for this action.

Recommended Citation:

Office of National Marine Sanctuaries. 2014. Thunder Bay National Marine Sanctuary Boundary Expansion Final Environmental Impact Statement. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries, Silver Spring, MD.

Acknowledgement

This document was prepared by several staff members of NOAA's Thunder Bay National Marine Sanctuary, including Superintendent Jeff Gray, Deputy Superintendent Russ Green, and Education Coordinator Sarah Waters. Significant assistance also came from Northeast and Great Lakes Regional Coordinator Ellen Brody and Office of National Marine Sanctuaries Program Analyst Hélène Scalliet. The proposal for an expanded Thunder Bay National Marine Sanctuary was developed over many years by the Thunder Bay National Marine Sanctuary Advisory Council. This dedicated group consisted of representatives of divers, fishermen, educators, tourism, economic development, and local elected officials.

See: http://thunderbay.noaa.gov/management/advisory_council.html

Acronyms

EPA – Environmental Protection Agency
DCR – Dry cargo residue
DEIS – Draft Environmental Impact Statement
FEIS – Final Environmental Impact Statement
MOA – Memorandum of Agreement
MPA – Marine Protected Area
NAO - NOAA Administrative Order
NEPA – National Environmental Policy Act
NMSA – National Marine Sanctuaries Act
NMSS – National Marine Sanctuary System
NOAA – National Oceanic and Atmospheric Administration
NOS – National Ocean Service
OLE – NOAA Office of Law Enforcement
ONMS – Office of National Marine Sanctuaries
SAC – Sanctuary Advisory Council
TBNMS – Thunder Bay National Marine Sanctuary
USCG – United States Coast Guard

Executive Summary

Thunder Bay National Marine Sanctuary

Located in northwestern Lake Huron, Thunder Bay is adjacent to one of the most treacherous stretches of water within the Great Lakes system. Unpredictable weather, murky fog banks, sudden gales, and rocky shoals earned the area the name "Shipwreck Alley". Fire, ice, collisions, and storms have claimed nearly 200 vessels in and around Thunder Bay. Today, the 448-square-mile Thunder Bay National Marine Sanctuary (TBNMS) protects one of America's best-preserved and nationally-significant collections of shipwrecks. To date, 45 historic shipwrecks have been discovered within the sanctuary. Although the sheer number of historic shipwrecks is impressive, it is the range of vessel types located in the sanctuary, their excellent state of preservation and accessibility to the public that makes the collection nationally significant. From an 1844 sidewheel steamer to a modern 500-foot-long German freighter, the shipwrecks of Thunder Bay represent a microcosm of maritime commerce and travel on the Great Lakes. Well preserved by Lake Huron's cold, fresh water, the shipwrecks and related maritime heritage sites in and around Thunder Bay are historically, archaeologically and recreationally significant.

NOAA designated the area (Figure 1) as a national marine sanctuary in 2000. The sanctuary is managed jointly by the National Oceanic and Atmospheric Administration (NOAA) and the State of

Michigan. A description of the sanctuary and its resources can be found in section III (Affected Environment).

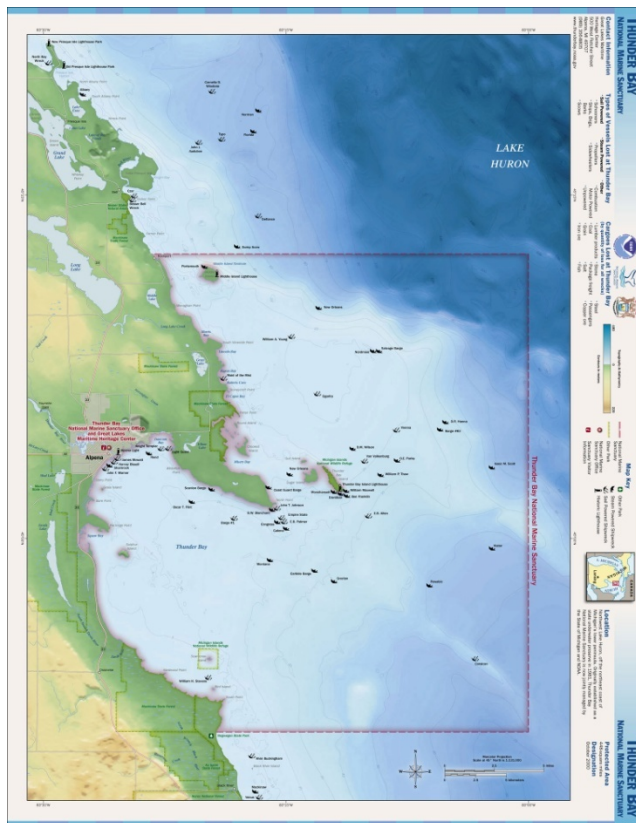


Figure 1. Thunder Bay National Marine Sanctuary.
The red box indicates the existing location of the Thunder Bay National Marine Sanctuary

NOAA is proposing to expand the boundaries of TBNMS. The three boundary alternatives are: (1) the existing boundary which is 448 square miles (the no-action alternative), (2) 880 square miles (Sturgeon Point Lighthouse to Presque Isle Lighthouse to 83 degrees W, and (3) 4,300 square miles (the preferred alternative), encompassing waters adjacent to Alcona, Alpena and Presque Isle counties, selected submerged maritime heritage resources in Cheboygan and Mackinaw counties, but not including the commercial ports at Alpena, Presque Isle (Stoneport), and Rogers City (Calcite). The eastern boundary of this alternative would be the U.S. / Canadian border.

Currently, the sanctuary's northern and southern boundaries are defined by the lakeward extension of the respective Alpena County borders while its eastern boundary is longitude 83° degrees west (approximately 45 shipwrecks are in this area). Archival research indicates that as many as 40 additional historic shipwrecks are yet to be discovered.

The genesis of the proposed expansion can be found in the sanctuary's final management plan (2009), which explains how a Thunder Bay National Marine Sanctuary Advisory Council (SAC or Advisory Council) working group recommended that the sanctuary expand its boundaries to protect historic shipwrecks and other maritime heritage resources in waters adjacent to the existing sanctuary. The working group determined that expanding sanctuary boundaries would help balance protection of important national historic sites through the sanctuary's well-established research, resource protection (including law enforcement), and education programs with recreational use. The working group presented this recommendation to the full Sanctuary Advisory Council, which approved the recommendation and then forwarded it to the sanctuary superintendent. As a result, the 2009 management plan included a strategy to consider the expansion of the sanctuary in the resource protection action plan.

Based on the Advisory Council's recommendation, research by sanctuary staff, and strong public support and comment during public meetings preceding and during this proposal, NOAA's preferred alternative was the expansion of the existing boundaries from 448 square miles to an area that encompasses 4,300 square miles of waters adjacent to Alcona, Alpena and Presque Isle counties, selected submerged maritime heritage resources in Cheboygan and Mackinaw counties, and extending lakeward to the Canadian boundary. On June 14, 2013, NOAA published a proposed rule in the Federal Register to expand the sanctuary boundaries (78 FR 35776). An accompanying draft environmental impact statement (DEIS) (78 FR 35928) was published on the same day.

Three public meetings on the proposed rule were held in July 2013 in Michigan, and the public comment period was extended on three separate occasions, eventually closing on December 19, 2013 (78 FR 49700, 64186 and 73112). NOAA extended the comment period for the DEIS and proposed rule to gather more information from stakeholders and consult with the U.S. Coast Guard (USCG) and U.S. Environmental Protection Agency (EPA), both of whom have regulations that apply to national marine sanctuaries. In response to public comments and information received, NOAA decided to amend the proposed rule and provide additional time for the public to submit comments on the amended proposed rule. Ultimately, NOAA chose to exclude the commercial port at Alpena as well as not to include the commercial ports at Presque Isle (Stoneport) and Rogers City (Calcite) in its preferred alternative. In consultation with appropriate Indian tribes, NOAA also strengthened and clarified language in its regulations pertaining to tribal fishing.

Expanding the boundaries in NOAA’s preferred alternative would add 47 known historic shipwrecks to the sanctuary. Among them are some of the Great Lakes’ best preserved and recreationally significant shipwrecks. Archival research indicates that as many as 60 additional historic shipwrecks could be discovered in this proposed expanded area. Consequently, NOAA’s preferred alternative would result in a 4,300-square-mile sanctuary (including the existing sanctuary) containing 92 known historic shipwrecks and the potential to discover as many as 100 additional sites (see Table 1).

Table 1: Summary of known and suspected shipwrecks in each boundary alternative

	Total Area of Sanctuary (sq. mi.)	Known shipwrecks	Suspected shipwrecks
Alternative A (No Action, retain current boundary)	448	45	40*
Alternative B (Presque Isle Lighthouse to Sturgeon Point Lighthouse)	808	60 (adds 15 sites to existing sanctuary)	64* (adds 24 suspected shipwrecks)
Alternative C (NOAA’s Preferred Alternative)	4,300	92 (adds 47 sites to existing sanctuary)	100* (adds 60 suspected shipwrecks)

*Approximate locations of undiscovered shipwrecks are based upon historic records.

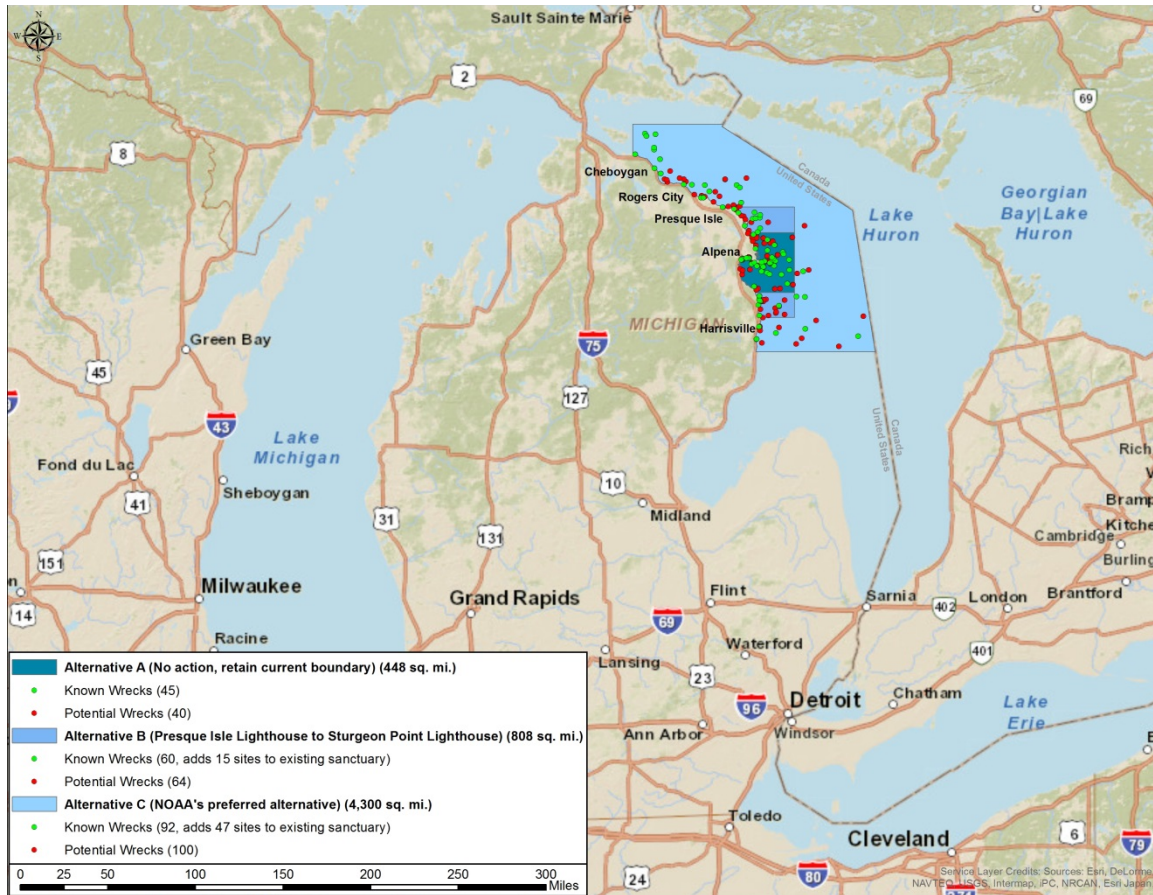


Figure 2: TBNMS boundary expansion alternatives in a broader context.

Green dots represent known shipwrecks, red dots are potential shipwrecks (locations based on historical records).

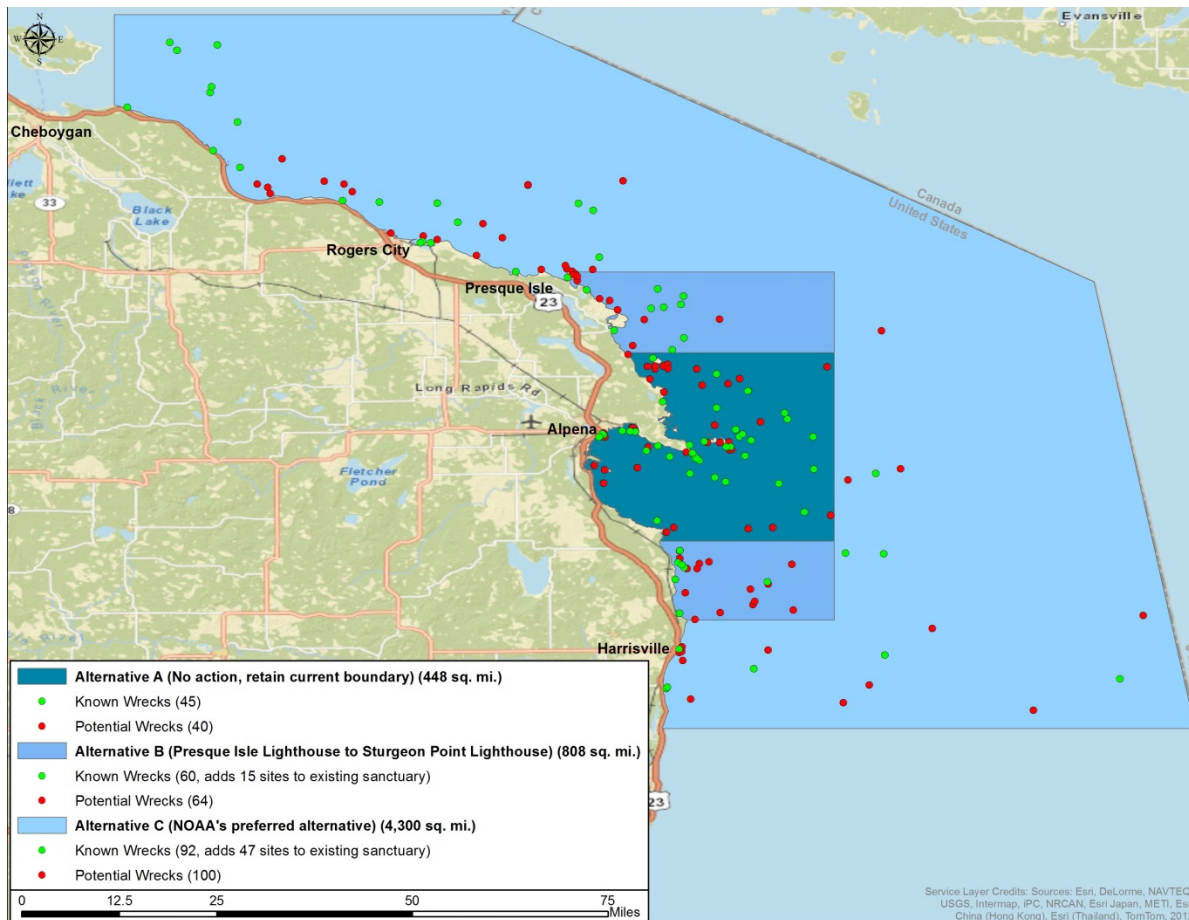


Figure 3: TBNMS boundary expansion alternatives in a regional context. Alternative C, NOAA's preferred Alternative, would not include the commercial ports at Rogers City, Presque Isle and Alpena. Green dots represent known shipwrecks, red dots are potential shipwrecks (locations based on historical records).

Section I provides background on the National Marine Sanctuary System, Section II states the purpose and need for action, and Section III describes the affected environment.

Section IV (Description of Proposed Action and Alternatives) provides a description of a range of alternatives. In addition to the preferred alternative, NOAA is evaluating an alternative that is smaller in area yet designed to address key heritage resources that lie beyond the existing sanctuary boundaries. NOAA is also evaluating the status quo in a no-action alternative.

Section V (Environmental Consequences) provides an analysis of the potential environmental impacts for each alternative. No significant adverse impacts to resources and the human environment are expected. Rather, long-term beneficial impacts are anticipated if the proposed action is implemented. Under NEPA (42 U.S.C. 4321 *et seq.*), an environmental assessment would have sufficed to analyze the impacts of this action since NOAA is proposing that no significant impacts are likely. However, the NMSA requires NOAA to publish an environmental impact statement regardless of the intensity of the impacts of the proposed action if NOAA is considering

changing the terms of designation of a sanctuary, which includes changes to a sanctuary's boundary coordinates (16 U.S.C. 1434).

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I. Background

This section places the proposed action into the context of the mission of Office of National Marine Sanctuaries (ONMS) and Thunder Bay National Marine Sanctuary (TBNMS) through the provisions of the National Marine Sanctuaries Act (NMSA).

The National Marine Sanctuaries Act

The NMSA (16 U.S.C. 1431 et. seq.) is the organic legislation governing ONMS (<http://sanctuaries.noaa.gov/library/national/nmsa.pdf>). The NMSA authorizes the Secretary of Commerce to designate as a national marine sanctuary any discrete area of the marine environment (including the Great Lakes) with special national significance due to its conservation, recreational, ecological, historical, scientific, cultural, archeological, educational or esthetic qualities. Among the purposes and policies of the NMSA are the mandates to:

- 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 (NMSS; 16 U.S.C. 1431 (b)(4)).
- Support, promote, and coordinate scientific research on, and long-term monitoring of, the resources of these marine areas (16 U.S.C. 1431 (b)(5)).

The designation of the Thunder Bay National Marine Sanctuary directly follows these directives from the NMSA.

Office of National Marine Sanctuaries

ONMS is the federal program within the National Oceanic and Atmospheric Administration (NOAA), National Ocean Service (NOS) charged with managing national marine sanctuaries as the NMSS. The mission of ONMS is to identify, designate, protect, restore, and manage areas of the marine environment of special national significance due to their conservation, recreational, ecological, historical, scientific, educational, cultural, archeological, or esthetic resources and qualities. The ONMS serves as the trustee for 14 marine protected areas encompassing more than 170,000 square miles of ocean and Great Lakes waters from Washington State to the Florida Keys and from New England to American Samoa (Figure 4). Within their protected waters, giant whales feed, breed and nurse their young, coral colonies flourish, and shipwrecks tell stories of our maritime history. Sanctuary habitats include beautiful rocky reefs, lush kelp forests, whale migration corridors and destinations, spectacular deep-sea canyons, and underwater archaeological sites. The marine protected areas range in size from one mile in diameter Monitor National Marine Sanctuary to almost 140,000 square miles in the Papahānāumokuākea Marine National Monument in the Northwestern Hawaiian Islands. Each area is a unique place deserving of special protection. They serve as natural classrooms, cherished recreational spots and places for valuable commercial activities. They represent many things to many people and are part of our nation's legacy to future generations.

NATIONAL MARINE SANCTUARY SYSTEM

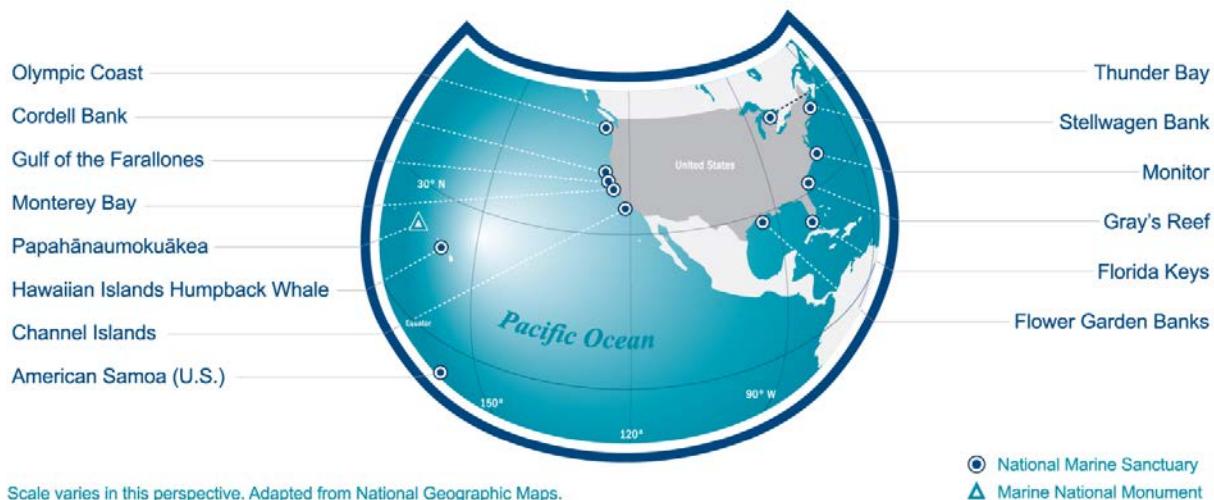


Figure 4: The System of National Marine Sanctuaries.

ONMS raises public awareness of sanctuary resources and conservation issues through programs of scientific research, monitoring, exploration, education and outreach. ONMS provides oversight and coordination of the sanctuary system by setting priorities for addressing resource management issues and directing program and policy development. To protect the living marine and non-living resources of sanctuaries, ONMS works cooperatively with the public in developing sanctuary management plans and regulations consistent with the NMSA.

Sanctuaries as Marine Protected Areas

National marine sanctuaries, including Thunder Bay, are marine protected areas (MPAs) (Executive Order No. 13158 (May 26, 2000, 65 F.R. 34909)). Sec. 2. (a) of Executive Order No. 13158 defines a marine protected area as “...any area of the marine environment that has been reserved by Federal, state, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein.” MPAs are geographical areas “where natural and/or cultural resources are given greater protection than the surrounding waters (E.O. 13158, 2000).”¹ An MPA can be located in the open ocean, coastal areas, inter-tidal zones, estuaries, or the Great Lakes. Examples of MPAs in the Great Lakes, in addition to TBNMS, include: Isle Royale National Park, Apostle Island National Lakeshore, Pictured Rocks National Lakeshore, Indiana Dunes National Lakeshore, and Sleeping Bear Dunes National Lakeshore. A complete list of MPAs in the Great Lakes can be found at http://marineprotectedareas.noaa.gov/helpful_resources/inventoryfiles/GreatLakes_MPAs_Wallmap_052809.pdf.

¹ <http://marineprotectedareas.noaa.gov/aboutmpas/definition/>

Comprehensive Management of the NMSS

The NMSA includes a finding by Congress that ONMS will “improve the conservation, understanding, management and wise and sustainable use of marine resources” (16 U.S.C. 1431(a)(4)(A), §301(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 U.S.C. 1431(a)(3), §301(a)(3)). Accordingly, ONMS subscribes to a broad and comprehensive management approach to meet the NMSA’s primary objective of resource protection.

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 the ONMS span diverse geographic, administrative, political and economic boundaries. Strong partnerships among resource management agencies, the scientific community, stakeholders and the public at-large are needed to realize the coordination and program integration that the NMSA calls for in order to comprehensively manage national marine sanctuaries.

National Historic Preservation Act of 1966

The National Historic Preservation Act of 1966 (NHPA; Public Law 89-665; 16 U.S.C. 470 *et seq.*) is intended to preserve historical and archaeological sites in the United States of America. The act created the National Register of Historic Places, the list of National Historic Landmarks, and the State Historic Preservation Offices. Section 106 of the NHPA requires Federal agencies to take into account the effects of their undertakings on historic properties, and afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment. The historic preservation review process mandated by Section 106 is outlined in regulations issued by ACHP (36 CFR Part 800). The Michigan State Historic Preservation Office, which implements section 106 of the NHPA, is located in the Michigan State Housing Development Authority. When necessary, TBNMS coordinates directly with the State Historic Preservation Office, as is the case with the proposal to expand the sanctuary boundary.

TBNMS Management

In 1981, the State of Michigan created the Thunder Bay Underwater Preserve, a 290-square-mile area designated as the first of eleven preserves authorized by Michigan’s “Bottomlands Act”, 1980 PA 184, MCL 299.51 *et seq.* The Bottomlands Act has since been superseded, and the state’s preserve program is presently authorized by Part 761 of the Natural Resources and Environmental Protection Act, 1994 PA 451, MCL 324.76101 *et seq.* On October 7, 2000, the Secretary of Commerce, under the NMSA, designated the Thunder Bay National Marine Sanctuary and Underwater Preserve as the nation’s thirteenth national marine sanctuary. The State of Michigan

later officially expanded the Thunder Bay Underwater Preserve to 448 square miles. Thunder Bay National Marine Sanctuary is the only freshwater sanctuary, and the only national marine sanctuary located in the Great Lakes.

The 448-square-mile area of northwestern Lake Huron is now both a national marine sanctuary and a state underwater preserve. The sanctuary's northern and southern boundaries are defined by the lakeward extension of the respective Alpena County borders while its eastern boundary is longitude 83° west (approximately 20 miles off the city of Alpena). The sanctuary's western boundary follows the contours of the Michigan shoreline at the ordinary high water mark. Forty-five known historic shipwrecks are in this area. Archival research indicates that as many as 40 additional historic shipwrecks are yet to be discovered.

The sanctuary is managed jointly by NOAA and the State of Michigan. The Michigan Historical Center, within the Department of Natural Resources, represents the state in managing the sanctuary. The NOAA sanctuary superintendent manages the day-to-day operations and activities of the site while a Joint Management Committee, consisting of the ONMS Director and a state agency member, makes major policy, budget, and management decisions. In addition, an advisory council provides advice to the NOAA sanctuary superintendent. Members of the Thunder Bay National Marine Sanctuary Advisory Council represent the community's interests, including government, education, maritime history and interpretation, fishing, diving, tourism, economic development, the state-designated underwater preserve, and the community-at-large.²

² The official name of the sanctuary is the Thunder Bay National Marine Sanctuary and Underwater Preserve. To simplify the name, the Joint Management Committee agreed to use the name Thunder Bay National Marine Sanctuary.

II. Purpose of and Need for Action

This section specifies the underlying purpose and need for the proposed action to expand the boundaries of TBNMS.

Purpose of Action

The purpose of this action is to provide long-term resource protection and comprehensive management for 47 additional known historic shipwrecks of special national significance, and other maritime heritage resources (i.e. docks, cribs), outside the sanctuary's existing boundaries. The action will also provide protection for historic shipwrecks and maritime heritage resources yet to be discovered.

The proposed action aligns with the NMSA purposes and policies and TBNMS goals and objectives in the following ways:

National Marine Sanctuaries Act (NMSA)

The purposes for this action, as it relates to the purposes and policies of the NMSA, are twofold:

(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 U.S.C. 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 U.S.C. 1431(b)(2)).

Sanctuaries are managed to protect and conserve their resources and to allow uses that are compatible with the primary objective of resource protection.

TBNMS Designation, Goals and Objectives

NOAA designated the sanctuary as the nation's thirteenth national marine sanctuary in 2000 for the purpose of: "Providing long-term protection and management to the conservation, recreational, research, educational, and historical resources and qualities of the area."

TBNMS Management Plan

New challenges and opportunities emerge with time. For this reason, the NMSA requires periodic updating of sanctuary management plans (and regulations, if appropriate) to reevaluate site-specific goals and objectives and to develop management strategies and activities to ensure the sanctuary best protects its resources. The original TBNMS Management Plan was written as part of the sanctuary designation process and published in the final environmental impact statement.³

³ <http://thunderbay.noaa.gov/pdfs/thunderbayeis.pdf>

In 2009, NOAA published an updated final management plan in coordination with the TBNMS Advisory Council.⁴ The 2009 final management plan contained a strategy and action plan specifically for considering the expansion of the sanctuary in an upcoming public process (see Alternatives). This strategy was recommended by the Sanctuary Advisory Council and formed the basis for developing NOAA's current preferred alternative.

STRATEGY RP-1: Evaluate and assess a proposed expansion of the sanctuary to a 3,662-square-mile area from Alcona County to Presque Isle County, east to the international border with Canada to protect, manage, and interpret additional shipwrecks and other potential maritime heritage resources.

Need for Action

Beyond the sanctuary's existing boundaries are 47 additional historic shipwrecks that are at risk to threats which include both human activities and natural processes. Human threats include looting and altering sanctuary shipwreck sites and damaging or destroying sites by anchoring. Natural process include the impacts of wind, waves, storms and ice, as well as the impact of invasive species such as zebra and quagga mussels that today cover most of Lake Huron's shipwrecks. These processes threaten the long term sustainability of historic shipwrecks and other maritime heritage resources. As described in the environmental consequences section, to ensure their long-term protection, these 47 additional known historic shipwreck sites would require the same level of research and resource protection afforded sites within the existing TBNMS boundary.

These maritime heritage resources would require long-term protection and management in order to reduce threats that could impact their historical, archeological, recreational and educational value. In addition, the comprehensive and coordinated management that NOAA provides includes extensive research, education, and outreach programs that would fill important gaps in archeological knowledge and historical context of these shipwrecks as well as enhancing sustainable recreational and tourism opportunities.

While state laws and other federal laws intended to reduce the impact of human activities on historic shipwrecks and related maritime heritage resources have been effective, sanctuary expansion would provide additional protection in the following ways: (1) The sanctuary regulations apply to all shipwrecks, not just abandoned shipwrecks as provided in the Abandoned Shipwreck Act; (2) The use of grappling hooks or other anchoring devices is prohibited on underwater cultural resource sites that are marked with a mooring buoy; (3) "Hand-taking" of artifacts outside the Thunder Bay Underwater Preserve, but still within the sanctuary boundary, is prohibited; (4) Permit applications are required to satisfy the Federal Archaeology Program

⁴ <http://sanctuaries.noaa.gov/management/mpr/tbnmsmp.pdf>

guidelines; and (5) as an additional enforcement mechanism, NOAA may assess civil penalties for violation of Sanctuary regulations or the National Marine Sanctuaries Act.

Additionally, there is a need to apply education and outreach efforts to shipwrecks beyond the sanctuary's current boundaries in order to promote responsible use of sanctuary resources and help reduce human impacts to these.

Support for an expansion is widespread as demonstrated by city, county and township resolutions, by comments provided during public processes (e.g., during Management Plan review, scoping process for boundary expansion, and rulemaking). These entities have noticed that the designation of the Thunder Bay National Marine Sanctuary in 2000 has had a positive impact on community development and maritime heritage tourism in Northeast Michigan and as a result are interested in how a sanctuary expansion could contribute to enhancing recreational and tourism opportunities for those communities expansion of the sanctuary boundary could bring similar positive socioeconomic impacts to a larger geographic area in Michigan.

III. Affected Environment

This section provides a narrative of resources within NOAA's Preferred Alternative, which encompasses the other alternatives analyzed in Section IV (Alternatives). The Affected Environment section focuses primarily on the human uses of the environment, which includes maritime heritage resources of the sanctuary. This section also includes some parameters of the physical and biological environment (those aspects in which Thunder Bay NMS has a role in interdisciplinary research or where the natural environment has a direct effect on shipwrecks).

Human Environment

The Great Lakes and their connecting waterways provide a natural highway extending over a thousand miles into the heart of North America. For centuries before European contact, these inland seas and tributaries served as important lines of trade and communication for Native Americans. Over the past 300 years, these waters have been further exploited by Euro-Americans and have greatly contributed to the growth of the North American interior. Marine transport on the Great Lakes played a crucial role in the exploration, settlement, and industrialization of the region.

During the nineteenth and early twentieth centuries, the Great Lakes of North America evolved from an isolated maritime frontier on the western edge of the Atlantic World into the nation's busiest and the world's most significant industrial waterway, where innovative ships and technologies moved raw materials and agricultural products in larger quantities and at lower costs than at any previous time in history. 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 made possible the dramatic growth of the region's farms, cities, and industries. The Midwest, and indeed the American nation, could not have developed with such speed and with such vast economic and social consequences without the Great Lakes.

Dubbed "Shipwreck Alley", the treacherous waters around Thunder Bay, including NOAA's Preferred Alternative, claimed nearly 200 ships. The oldest known shipwreck sank in 1849 (*New Orleans*), while the most recent shipwreck occurred in 1966 (*Nordmeer*). Intense weather patterns, islands and rocky shoals, and heavy vessel traffic and converging shipping lanes all contributed to the area's vast collection of shipwrecks. These submerged archaeological sites are nearly a complete collection of Great Lakes vessel types from small schooners and pioneer steamboats of the 1830s, to enormous industrial bulk carriers that supported the Midwest's heavy industries during the twentieth century. Among the wrecks in and around the sanctuary are those vessels that carried immigrants and pioneers traveling west for new homes, schooners carrying Midwestern grain and lumber, passengers and package freight steamers, and evolving generations of bulk freighters specially designed to carry iron ore, coal, grain, cement, and other bulk commodities.

They are evidence of the Great Lakes' pervasive influence in regional and national history, and capture the cultural, personal, environmental, technological and economic aspects of maritime history. Finally, the shipwrecks identified in this document reflect the movement, bravery, tenacity and innovative spirit of generations of maritime people.

Maritime Heritage Resources

Shipwrecks

The following narrative offers a representative account of shipwrecks, arranged thematically, in NOAA's Preferred Alternative (which includes the current 448 square mile sanctuary).⁵ They are arranged here by vessel type and significance. After the name of each shipwreck, in parenthesis, are dates of build and loss, as well as the depth of water in which the site is located. A complete list of known shipwrecks in each of the three alternatives analyzed is presented in Section IV.

Early Steam

The oldest known shipwreck in the Thunder Bay area is the wooden paddle wheel steamer *New Orleans* (Figure 5). Rebuilt in 1843 on the hull of the burned steamer *Vermillion*, *New Orleans* ran aground west of Sugar Island on June 15, 1849 and now rests in 13 feet of water. Fishermen from Thunder Bay and Sugar Islands rescued the passengers and crew, and salvagers later recovered most of the cargo and machinery. Early steam paddle wheelers such as *New Orleans* are prime examples of the transition from sail to steam. Most were designed to carry large cargoes in their holds, while the upper works were elaborately decorated and furnished to accommodate ticketed passengers, many heading west to settle on the American frontier.

In addition to *New Orleans*, two other paddle wheelers, *Benjamin Franklin* (1842-1850; 15-foot depth), and *Albany* (1846-1853; 5-foot depth), grounded at Thunder Bay Island and Presque Isle, respectively. All three were extensively salvaged. The lower bilge, hull fragments, stern post and boiler area remnants of the *New Orleans* make for a complex and interesting shallow wreck site to visit. Little remains of the *Albany* and *Franklin* except the lower hull structure of each vessel, though *Franklin's* shafts, boilers, and machinery remain on the lake bottom only a few hundred yards from the Thunder Bay Island lighthouse. The side wheel steamer *Marine City* (1866-1880; 5-foot depth) is similarly broken up in shallow water north of the Sturgeon Point Lighthouse (Figure 5). Carrying over 150 people, the wooden vessel burned and sank in 1880 with the tragic loss of 20 lives.

⁵ This section excerpted largely from Lusardi, 2011.



Figure 5. Left, the scattered remains of the paddle wheel steamer *New Orleans* (1843-1849; 13 foot depth) are a complex artifact. Right, the paddle wheel steamer *Marine City* (1866-1880; 5 foot depth) carried passengers and freight on a regular schedule to Alpena and other port towns along Lake Huron. (NOAA Thunder Bay NMS; Thunder Bay Sanctuary Research Collection)

Schooners

Several dozen wooden schooners are located in NOAA's Preferred Alternative. The quintessential workhorse of the day, thousands of schooners sailed the Great Lakes in the late nineteenth century, and dozens were lost around Thunder Bay. Many schooners such as *E.B. Allen* (Figure 6, 1864-1871; 100-foot depth), *Lucinda Van Valkenburg* (1862-1887; 60-foot depth), *Cornelia B. Windiate* (1874-1875; 180-foot depth), *Kyle Spangler* (1856-1860; 180-foot depth), *F.T. Barney* (1856-1868; 160-foot depth), and *Typo* (1873-1899; 160-foot depth), have become very popular recreational and technical dive destinations. Discovered by the sanctuary in 2011, the schooner *M.F. Merrick* (1863-1889; 300-foot depth) was lost with all hands after a collision with a southbound steamer and is the latest addition to this list.



Figure 6. The schooner *E.B. Allen* rests in 100 feet of water and displays a degree of preservation typical in this depth range. (NOAA Thunder Bay NMS)

These shipwrecks represent typical vessels of the late nineteenth century known as canalers, designed with dimensions specifically to allow passage through the Welland Canal connecting Lakes Erie and Ontario. The hulls configured as nearly as possible to the locks' dimensions (150 feet by 26 feet), and even the bowsprits were hinged to allow maximum hull length, and thus, cargo carrying capacity. By 1871, two thousand canalers plied the Great Lakes, most carrying grain eastward and coal westward. All of the aforementioned vessels, with the exception of *Windiate*, were sunk as result of collisions with other vessels in the busy shipping lanes off Alpena and Presque Isle. With no survivors or witnesses, *Windiate's* sinking remains a mystery, though unpredictable November weather was likely a factor. Designed to carry 16,000 bushels of wheat, but reportedly carrying 19,000, she may also have been dangerously overloaded to maximize profits during the last voyage of the season.

Interestingly, a group of schooners sunk on a pair of reefs in northern Lake Huron offers a dramatic connection between the maritime landscape and the shipwrecks associated with it. Spectacle Reef and nearby Raynold's Reef are a pair of shoals about ten miles northeast of Cheboygan. Over the years scores of vessels stranded on these shallow water reefs. In 1871, construction began on an 86-foot tall lighthouse on Spectacle Reef which was completed in 1874 and still stands today. In September 1869, just prior to construction, the *Nightingale* (1856-1869) stranded on the reef. Bound from Milwaukee to Oswego with 15,000 bushels of wheat, the schooner *Kate Hayes* (1856-1856) stranded on Spectacle Reef on a clear calm night in 1856. Nearby are the schooners *Newell Eddy* (1890-1893) and *Augustus Handy* (1855-1861). The 242-foot three-masted schooner barge, *Newell A. Eddy*, built at West Bay City, Michigan, in 1890, foundered in a storm with a cargo of grain and all nine hands in 1893. Resting in 160 feet of water, the well preserved site is a popular dive attraction. In 1855 the *Augustus Handy* was struck by lightning, disabled and sunk.

Smaller schooners, usually involved in more local endeavors, are also found in the area considered in the Preferred Alternative. *Maid of the Mist* (1863-1878; 7 foot depth), for example, was contracted to haul cedar posts from Alpena County to Detroit when it washed ashore in a gale at Huron Beach. Typical of the rough and tumble careers of Great Lakes schooners, the 15 year-old vessel was involved in a dozen mishaps before its ultimate demise, and evidence of large-scale repair is preserved in the archaeological record. The 117-foot *William Stevens* (1855-1863; 10 foot depth) and 112-foot *Corsican* (1862-1893; 160-foot depth) are further examples of these smaller sized schooners, as is the 115-foot *Defiance* (Figure 7, 1848-1854; 185 foot depth), the second earliest known shipwreck in the area. Remarkably well preserved with tiller steering and cookstove and galley remnants on deck, *Defiance* is an excellent example of an early Great Lakes schooner.

Larger than canal size schooners, 185-foot *American Union* (1862-1894; 8 foot depth) and 150-foot *Portland* (1863-1877; 6 foot depth), are both wrecked in shallow water near Presque Isle, their deep drafts likely contributing to their demise. Known, but yet unidentified remains of other large schooners in shallow waters may be those of the 156-foot *Fame* (1853-1887), 157-foot *Ishpeming* (1872-1903), and the 178-foot *Nellie Gardner* (1873-1883).



Figure 7. A photomosaic of the schooner *Defiance*, resting in 185 feet of water outside the sanctuary's northern boundary. Many popular, intact shipwrecks lay in deeper waters outside the sanctuary. In an effort to better understand and protect these impressive time capsules, sanctuary archaeologists regularly work outside sanctuary boundaries. (NOAA Thunder Bay NMS)

In deeper water is the 205-foot *John Shaw* (1885-1895; 130 foot depth), lost off Harrisville in a November snowstorm. Not all wrecking events are dramatic, however. The 162-foot, 3-masted schooner *Harvey Bissell* (Figure 8, 1866-1905; 15 foot depth), and canal-sized schooners *Knight Templar* (1965-1903; 5-foot depth) and *Light Guard* (1866-1903; 6-foot depth), were all abandoned along the inner reaches of Thunder Bay after serving long careers.

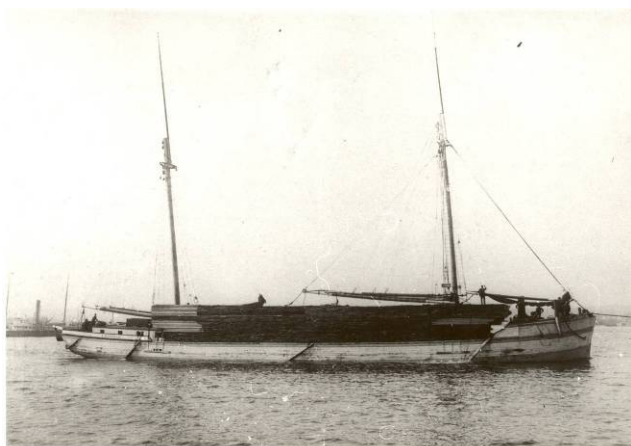


Figure 8. Originally built as a three-masted schooner, the 162-foot *Harvey Bissell* was later retrofitted to a two-masted "schooner barge," a typical conversion for schooners whose owners sought to keep the aging vessels in use. Pictured here with an enormous deck load of lumber, the *Bissell* wreck sits in 15 feet of water just off the Alpena waterfront. (Thunder Bay Sanctuary Research Collection)

Schooners are not the only sailing craft located in the region. The three-masted bark *Ogarita* (1864-1905; 30-foot depth) and brig *Bay City* (1857-1902; 11-foot depth) both wrecked in the sanctuary. *Ogarita* burned and sank when its cargo of 1,200 tons of coal ignited off Thunder Bay Island, while the aging and battered *Bay City* was abandoned along the Alpena waterfront. The 2-masted brigantine *John J. Audubon* (1854-1854; 170-foot depth) is located not far from its collision mate, the 2-masted schooner *Defiance* mentioned above. Their 1854 collision illustrates the hazards of Great Lakes shipping as it emerged in the mid-nineteenth century. The 1854 shipping season was the most costly to date with losses totaling 119 lives, 70 ships and 2 million dollars in property. The *Defiance* and *John J. Audubon* are victims of that dangerous year.

Steamers

Steamers, also known as steam barges, were purpose-built to carry bulk cargo while simultaneously towing as many as three “consort” barges. Steamers are also well represented in the area, particularly on North Point Reef, a geologic feature that extends over one mile from shore and rises to within five feet of the surface. The wooden steam barge *Galena* (1857-1872; 16 foot depth) went ashore on North Point carrying 272,000 feet of lumber on September 24, 1872 and quickly broke apart. Much of the machinery, furniture, bedding, and crews’ possessions were removed from the wreck, and the engine was later salvaged for use in another vessel. Wreckage tentatively identified as disarticulated pieces of *Galena* lies intermingled with materials from later losses, a common occurrence in the shallow, dynamic waters off North Point Reef.

Similarly, the wooden steam barge *B.W. Blanchard* (Figure 9, 1870-1904; 9-foot depth) towing the wooden schooner barges *John T. Johnson* (1873-1904; 7-foot depth) and *John Kilderhouse* went aground on North Point during a blinding snowstorm in November 1904. *Blanchard* and *Johnson* were completely wrecked, while *Kilderhouse* was eventually recovered. The vessels carried a combined load of 2,000,000 feet of lumber, most of which was recovered. The suspected *Blanchard* and *Johnson* sites today rest a few hundred feet apart in less than 10 feet of water. Though difficult to identify with precision, the scattered remains of several other vessels are located on North Point Reef as well, including the brig *Empire State* (1862-1877), schooner *E. B. Palmer* (1856-1892), and steamer *Congress* (1861-1868), which saw service during the Civil War in Tidewater, Virginia. Broken up into several large sections in deeper water off Thunder Bay Island is the steam barge *William P. Thew* (1884-1909; 70-foot depth), while closer inshore is the steam barge *Oscar T. Flint* (Figure 10, 1889-1909; 30-foot depth), burned to the waterline and still filled with its limestone cargo.



Figure 9. The wooden steam barge *B.W. Blanchard* operated for 34 years before running aground in Thunder Bay during a blinding snowstorm. With much of the wrecked vessel exposed, it quickly succumbed to winds and waves. Today, its remains scattered in shallow water, mixed with the wreckage of other vessels that shared a similar fate. (Thunder Bay Sanctuary Research Collection)

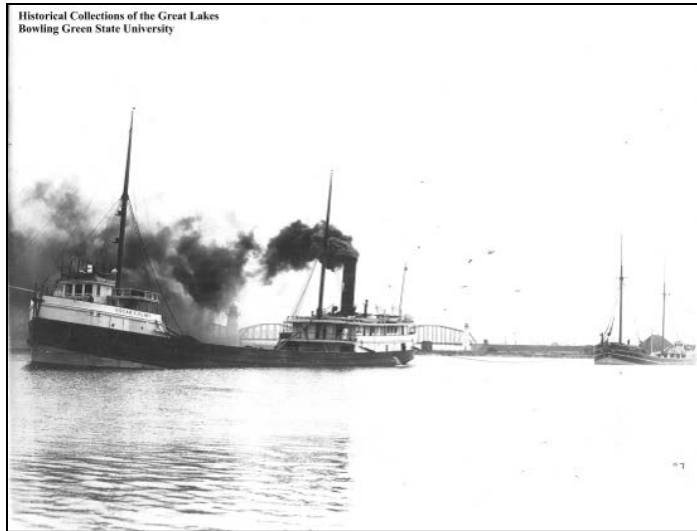


Figure 10. The steam barge *Oscar T. Flint* with a schooner barge in tow. In 1909, the *Flint* caught fire and sank in 30 feet of water in Thunder Bay. (Historical Collections of the Great Lakes, Bowling Green State University)

Freighters

With examples spanning over 80 years, bulk and package freighters are also well represented in and around the sanctuary including *James Davidson* (1874-1883; 38-foot depth), *Joseph Fay* (1871-1905; 0-17-foot depth), *D. M. Wislon* (1873-1894; 48-foot depth), *Egyptian* (1873-1897; 230-foot depth), *New Orleans* (1885-1906; 130-foot depth), *William Rend* (1888-1917; 17-foot depth), *Shamrock* (1875-1905; 11-foot depth), *Monohansett* (1872-1907; 18-foot depth), *Florida* (Figure 11, 1889-1897; 200-foot depth), *Grecian* (1891-1906; 90-foot depth), and *Montana* (Figure 12, 1872-1914; 60-foot depth). Many of these wrecks are popular dive destinations because of their structural integrity or unique circumstances of loss. *Florida*, for example, collided with the *George W. Roby* off Middle Island and went down with a cargo of 50,000 bushels of wheat, 1,451 barrels and 3,150 sacks of flour, syrup, barrels of whiskey, and a full upper load of package freight, much of which remains on site.



Figure 11. Resting in 200 feet of water the wreck and cargo of the steamer *Florida* is well preserved. At left a diver swims between decks while hovering above are several air-tight barrels still buoyant after 114 years. At right a view from above into one of the package freighter's cargo holds, with cargo still stacked along the hull. (NOAA Thunder Bay NMS)



Figure 12. Launched in 1872, the package freighter *Montana* met her fiery end in Thunder Bay 42 years later – an incredibly long career for a Great Lakes vessel. The cavernous retrofitted vessel held one million board feet of lumber, enough to stretch for nearly 200 miles if placed end to end. (Thunder Bay Sanctuary Research Collection, NOAA Thunder Bay NMS)

The steel-hulled bulk freight steamer *Grecian*, a Globe Iron Works creation, stranded at De Tour, Michigan then foundered in Thunder Bay while under tow southbound for repairs. Two large steel tanks known as canalons were sunk and fastened to *Grecian's* stern by hardhat divers intending to raise the vessel in 1909. The tanks exploded when filled with air and remain attached to the wreck. *Grecian's* sistership, the 300-foot long *Norman* (Figure 13, 1890-1895; 210-foot depth), is located just 20 miles north, having collided with the Canadian steamer *Jack* in the busy shipping lanes off Presque Isle. Between 1890 and 1920, industrial giants like John D. Rockefeller created steel corporations that required vast Great Lakes fleets to carry iron ore, the main raw material used to make steel. The *Grecian* and *Norman* were part of the fleet serving J. P. Morgan's enormous U.S. Steel Corporation, the nation's first billion-dollar firm.

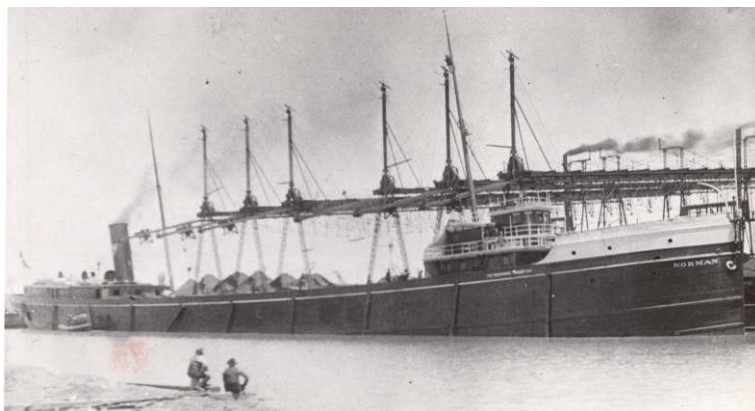


Figure 13. The 300-foot long steamer *Norman*, resting in 200 feet of water outside the sanctuary's northern boundary. Listing to port but amazingly intact, the enormous steel wreck contains many artifacts as well as human remains. (NOAA Thunder Bay NMS, Thunder Bay Sanctuary Research Collection)

Perhaps the most tragic accident in Thunder Bay occurred in August 1865 when the passenger freighter *Pewabic* (Figure 14, 1863-1865; 160-foot depth) was run into and sunk by its sister vessel *Meteor* with the loss of no fewer than 30 lives. Weather conditions were favorable and the vessels were in sight of one another for several miles before impact. Though damaged, *Meteor* was able to continue to Sault Ste. Marie after rescuing many passengers from the water. Built by Peck and Masters of Cleveland, *Pewabic* went down with several hundred tons of valuable copper and iron ore in its hold. Search efforts began immediately, though the wreck was not discovered until June 1897. Much of the cargo was recovered using armored divers, submersible bells with manipulator arms, and bucket cranes, though at great cost; several divers perished on the wreck from drowning or decompression illnesses. At a time when Michigan's Upper Peninsula produced the majority of America's copper, vessels like the *Pewabic* were critical to the war effort. The 200-foot steamer raced through the water at 12 knots, powered by twin engines that turned 8-foot diameter propellers.

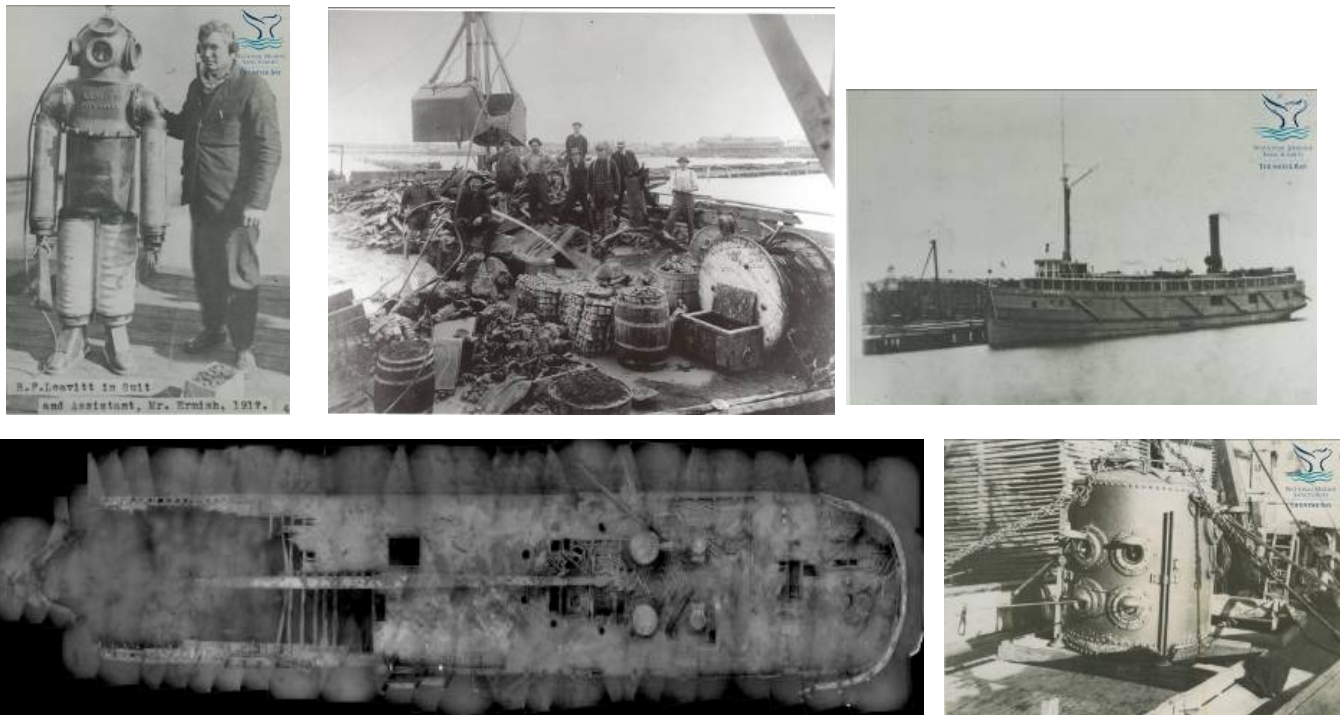


Figure 14. The steamer *Pewabic's* valuable cargo inspired a century of high-risk salvage efforts. Salvagers employed divers, dynamite, dredges and even a custom-built diving bell in pursuit of the copper cargo lying 160 feet below the surface. (Thunder Bay Sanctuary Research Collection, NOAA Thunder Bay NMS)

Even with more accurate charts and advanced positioning, modern freighters still occasionally sunk in Lake Huron during the 20th century. *Isaac M. Scott* (1909-1913; 175-foot depth) was one of eight vessels that sank in Lake Huron during an infamous storm in 1913. The storm took the lives of 194 seamen. The *Scott*, which sank with all hands onboard, lies upside down on the lake bottom like many of its contemporaries. *D.R. Hanna* (1906-1919; 130-foot depth), *W.C. Franz* (1901-1934; 230-

foot depth), *W. H. Gilbert* (1892-1914; 230-foot depth), *Viator* (1904-1935; 165-foot depth), *Etruria* (1902-1905; 300-foot depth), and *Monrovia* (Figure 15, 1943-1959; 130-foot depth) all went down resulting from collisions in the busy shipping lanes off Thunder Bay.

The German freighter *Nordmeer* (1954-1966; 35-foot depth), Thunder Bay's most recent shipwreck, ran upon a shoal and stuck fast in 1966. The steadfast crew remained onboard for several days hoping to free the freighter, necessitating a daring helicopter rescue by the U.S. Coast Guard amidst a November storm. A local landmark, the vessel's superstructure remained above the waterline for many years until finally succumbing to winter ice and storms and collapsing beneath the surface in 2010. A salvage barge, involved in recovery of scrap steel and machinery from *Nordmeer*, sits on the bottom near the larger wreck.

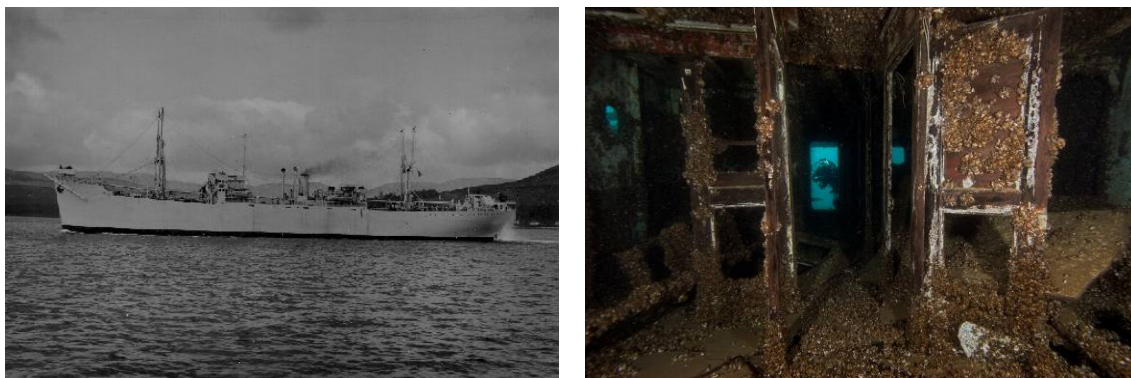


Figure 15. The *Monrovia*, pictured here as the *SS Empire Falstaff*, sank during a 1959 collision and became one of the first Great Lakes shipwrecks of the St. Lawrence Seaway era. Today, the wreck of the *Monrovia* sits in 140 feet of water and is a popular dive site. (left, Stuart Cameron Collection; right, Andy Morrison)

Barges and Tugs

Perhaps not as romanticized as passenger vessels, paddle wheelers, or sailing craft, barges and tugs also played an important role in Great Lakes maritime history. *Lake Michigan Car Ferry Barge No. 1*, built in 1895 by James Davidson to haul 28 rail cars on four tracks across the decks, was converted to a tow barge before sinking with a deck load of lumber and 200 crates of live chickens in November 1918. *Barge No. 83* (1920-1941; 80-foot depth) foundered northeast of Thunder Bay Island with well-drilling machinery and sheet piling. *Scanlon's Barge* (unknown date of loss; 30-foot depth) sank off North Point with a derrick crane on board, and the *Carbide Barge* (unknown date of loss; 90-foot depth) and *Dump Scow* (unknown date of loss; 130-foot depth) also foundered in heavy seas with un-salvaged deck equipment still in place.

Examples of tugs and vernacular craft also exist in and around the sanctuary. The tug *William Maxwell* (Figure 16, 1883-1908; 12-foot depth) is viewable off Thunder Bay Island in only eight feet of water. Built in Chicago, *Maxwell* was employed by the Huron Fish Company to trawl the waters off Thunder Bay. Today the bilge, deadwood, propeller, and shaft of the vessel remain. Off Rogers

City are the tugs *W. G. Mason* (1898-circa 1924; 13-foot depth) and *Duncan City* (1883-circa 1923; 15-foot depth), both excellent snorkel and kayaking sites with consistently clear water.



Figure 16. The tug *W. G. Mason*, built in 1898 and abandoned near Rogers City around 1924. Several smaller, local craft like these are found around Thunder Bay (NOAA Thunder Bay Sanctuary Research Collection).

Additional Maritime Heritage Sites and the Cultural Landscape

Shipwrecks are not the only submerged cultural resources located in and around Thunder Bay. Structural features and cultural landscape alterations are also evident on the lake bottom. Cribs, docks, pier footings, and pilings are located near the Alpena waterfront (but not inside the port), off North Point, and around the many islands in the bay. Additionally, dozens of vessels were stranded on various shoals and eventually recovered, but not before leaving behind jettisoned cargo, lost salvage equipment, or other artifacts on the lake bottom.

In addition to the submerged resources described above, are other aspects of the region's maritime cultural landscape. As defined by the National Park Service, a cultural landscape is a geographic area including both cultural and natural resources, coastal environments, human communities, and related scenery that is associated with historic events, activities or persons, or exhibits other cultural or aesthetic values (NPS 1997). The Thunder Bay region is comprised of many shoreline features such as beached shipwrecks, lighthouses, aids to navigation, abandoned docks, working waterfronts and Native American sites (Figures 17 and 18). Also important are the intangible elements such as spiritual places and legends.



Figure 17. A bird's-eye view of the City of Alpena in 1880, including lumber docks to the left of the mouth of the Thunder Bay River and log booms to the right of the river. Submerged remnants of this historic waterfront still survive and are part of the area's maritime cultural landscape.



Figure 18. The beached remains of the 215-foot wooden steamer *Joseph Fay* and nearby Forty-Mile Point Lighthouse are dramatic and closely related aspects of the Thunder Bay area's maritime cultural landscape. Taking on water amidst a violent October storm in 1905, the *Fay's* captain drove the iron ore laden vessel ashore only 200 yards from the lighthouse. (NOAA Thunder Bay NMS)

Tourism

The region's position along the Great Lakes coast has been vital to its economic development. The lakes have served as the regional highway, allowing people and goods to move freely even when roads and other infrastructure was lacking or rudimentary. During the last half of the twentieth century, the rugged and relatively undeveloped coast began to attract tourists, who come for the area's hunting, fishing and natural beauty, and to visit the network of historic lighthouses and dive the many shipwrecks.

Approximately 53,000 people live in Alpena, Presque Isle and Alcona Counties, immediately adjacent to the sanctuary. Total employment in the three counties is around 25,000 and total personal income is upwards of \$1.6 billion annually (Michigan Sea Grant, 2006).

As a popular destination for outdoor recreation, people travel to the region for fishing, scuba diving and snorkeling on shipwrecks, visiting beaches, touring lighthouses, camping and hunting. Over one million people visit the region every year. A 2005 study estimated annual visitor spending in

the three counties to be approximately \$110 million supporting around 1,700 jobs (Michigan Sea Grant 2006). Of this \$110 million spent by visitors in the study area, the state captures approximately \$67 million (61%) in direct sales by tourism-related businesses. These sales directly support 1,365 jobs with a total payroll of \$27.4 million and \$36.9 million in value added. Every dollar of direct sales yields another \$.38 in secondary sales through indirect and induced effects. Total impacts including secondary effects are \$92 million in sales, \$35.8 million in personal income, \$51.3 million in value added, and 1,704 jobs.

The Thunder Bay National Marine Sanctuary's Great Lakes Maritime Heritage Center (the sanctuary's visitor center) is a major tourist destination for the region. Attendance in 2012 surpassed 83,000 visitors. This is an increase of over 10,000 people from 2011, and an increase of nearly 30,000 from 2010. The Center features 9,000 square feet of immersive exhibits, a 93-seat theater showing films daily, an archaeological conservation lab and shipwreck artifact gallery, innovative education space for special programs, meetings, and events, scientific research facilities, including a dive operations center, a community boat-building center small watercraft workshop, outdoor access to the Great Lakes Maritime Heritage Trail and open-air picnic grounds, and a Maritime Heritage Center Gift Shop.

The Thunder Bay Maritime Festival is an annual day-long event on July 4, which draws over 10,000 people to the sanctuary. The festival is free to the public and includes tours of tall ships, research vessels, and fishing boats docked along the Great Lakes Maritime Heritage Trail. Visitors enjoy live music, kids' games and crafts, a small boat workshop, taste local whitefish, and explore shipwreck exhibits.

Alpena and Thunder Bay NMS have become a major center of Great Lakes research. The sanctuary and its partners use and test a variety of marine technology while conducting research in Lake Huron. In 2011, sanctuary related research attracted nearly 200 researchers from around the United States, including government researchers, university faculty and students, nonprofit organizations and film makers. These research teams spent a total of \$713 per individual stay in Alpena.

Thunder Bay NMS has recruited several tourism-related businesses to the area. Alpena Shipwreck Tours offers glass bottom boat tours of Thunder Bay that depart from the Great Lakes Maritime Heritage Center. In the company's second year of operation (2012), over 9,500 passengers cruised aboard their vessel, the Lady Michigan. Over 2,000 students participated in educational programs aboard the Lady Michigan in 2012. The vessel has had a positive impact on the local economy, and it features marine technology (ROVs and diving) as part of its tour.

The Alpena community has embarked on a new unified branding effort. It centers on the brand promise that Alpena is the Sanctuary of the Great Lakes. One of the three tenants of this brand promise is maritime research and education.

Fishing

Because the scope of Thunder Bay NMS regulations is limited to the protection of maritime heritage resources, there is no direct anticipated effect on fishing in an expanded sanctuary. However, because commercial, recreational and tribal fishing are important activities that would occur in an expanded sanctuary, the status of those activities is summarized below.

The primary groups using the Lake Huron fisheries are state licensed commercial fishers, recreational anglers, and Native American commercial fishers.

Commercial Fishing

Commercial fishing has declined significantly since the 1940s, when commercial fish stocks collapsed. In 1930, close to 7,000 people were employed in the commercial fishing industry, but by 1975, a little over 1,100 people were employed. Since 2001, only two state-licensed and two to four tribally licensed commercial fishing operations have been operating out of Alpena County. Gillnets are no longer permitted for commercial fishing in central and southern Lake Huron, including within the sanctuary boundaries; trapnets are the only gear used. Today, the Thunder Bay region of Lake Huron is considered one of the most lucrative whitefish fishing grounds in the Great Lakes, and whitefish is the principal commercially harvested species within the Thunder Bay region (NOAA 1999). In 2000, about 60% of all lake whitefish came from Lake Huron (Kinnunen 2003). This decrease in commercial fishing has led to less impact from fishing gear at shipwreck sites.

Recreational Fishing

The popularity of recreational fishing has increased over the last century, particularly since the late 1960s, when salmon was introduced in the Great Lakes (NOAA 1999). In 1975, approximately 2.8 million recreational anglers were active on the Great Lakes (U.S. Comptroller General 1977). In 2006, 1.4 million persons age 16 years and older participated in recreational fishing in the U.S. waters of the Great Lakes, taking 13.3 million trips during 18 million days on the water and spending \$1.5 billion on equipment and trip-related items (USFWS and U.S. Dept. of Commerce Census Bureau 2007). Recreational fishing primarily targets lake trout, brown trout, steelhead, walleye and salmon. Popular fishing techniques include the use of planer boards and downriggers to take fishing line to specified depths. With the downturn in Chinook salmon numbers after 2004, there has been a 73% reduction in recreational fishing pressure in the Main Basin of Lake Huron. Walleyes are now the leading target for recreational fishing in Thunder Bay (Johnson and Gonder, in press).

For recreational fishing, there were 606 licensed fishing charter boats in Michigan in 1996. Alcona County had the greatest amount of licensed charter boats, with 10 boats. Alpena County had 8 licensed charter boats and Presque Isle County had 4 boats (Northeast Michigan Integrated Assessment, Michigan Sea Grant, 2006).

Tribal Fishing

NOAA's Preferred Alternative would include a large area currently fished by several regional tribes. Northern Lake Huron has been an important tribal fishing area for centuries. Under the current management structure of the 2000 Consent Decree, the area from the southern treaty boundary up to Cordwood Point includes parts of five separate named fishing zones. The Northern Lake Huron Inter-Tribal Fishing Zone allows fishers of all tribes to set gill nets or trap nets according to specific provisions. The Bay Mills Small Boat Zone is an area near Hammond Bay that specifically allotted for small boat gill netters from the Bay Mills Indian Community. The Sault Tribe Salmon Zone runs within one mile of shore from Cordwood Point south, nearly to the Hammond Bay harbor light and is open to Sault Tribe salmon fishermen. The Southern Lake Huron Trap Net Zone is open to Bay Mills and Sault Tribe fishers to set trap nets. The final area of tribal fishing is a "disputed zone". The Parties to the 2000 Consent Decree did not formally agree on the southern treaty boundary in Lake Huron, instead they settled on a disputed zone where tribal fishers may set nets, but only after being issued a permit by the Michigan Department of Natural Resources. As many as 20 individual tribal fishing licenses are active in these areas on an annual basis. Recently, the fishing activity has only been from two tribes, although the other three tribes signatory to the 2000 Consent Decree could pursue fishing opportunities in these areas in the future.⁶ Tribal fishers use both large- and small-mesh gill nets in addition to trap nets. Harvest in these zones has been comprised of Chinook Salmon, Cisco, Lake Trout, Lake Whitefish, Menominee, Walleye, and Yellow Perch, and it has totaled approximately 650,000 lb each year, representing a dockside value of more than one million dollars. To clarify that NOAA's action does not impact tribal fishing, NOAA's Preferred Alternative, includes language agreed upon by NOAA and tribal fishers during government to government consultation (see Description of Proposed Action and Alternatives).

Shipping

Commercial shipping occurs in upbound and downbound commercial shipping lanes located in Thunder Bay NMS. Commercial shipping to and from Alpena is associated predominately with cement producing operations, and occasional bulk coal and salt deliveries. Similar operations occur in the potential expanded boundaries, including quarries at Stoneport and Roger City.

Commercial shipping on the Great Lakes carries the raw materials that drive the nation's economy. Those raw materials include iron ore and fluxstone for the steel industry, aggregate and cement for the construction industry, coal for power generation, as well as salt, sand and grain. The scale and value of inter-lake commercial shipping on the Great Lakes is demonstrated via statistics compiled by the Lake Carriers' Association (LCA), which represents 17 American companies that operate 57 U.S.-flag vessels ("lakers") on the Great Lakes.

⁶ The 2000 Consent Decree was signed in August of 2000 by Bay Mills Indian Community, Grand Traverse Band of Ottawa and Chippewa Indians, Little River Band of Ottawa Indians, Little Traverse Bay Bands of Odawa Indians, Sault Ste. Marie Tribe of Chippewa Indians, the State of Michigan, and the United States and will be in place through 2020.

Collectively, LCA members transport more than 115 million tons of dry-bulk cargo per year. They employ more than 1,600 men and women and provide annual wages and benefits of approximately \$125 million. In turn, the cargos carried by LCA members generate and sustain more than 103,000 jobs in the United States and have an economic impact of more than \$20 billion. LCA vessels carry countless tons of cargo through the proposed expanded sanctuary area. Tens of millions of tons of iron ore bound for steelmakers in Michigan, Ohio, Pennsylvania and other states and Canada transit those waters. Millions of tons of coal for power plants along the St. Clair and Detroit Rivers pass through the proposed sanctuary. Calcite (Rogers City) and Stoneport (Presque Isle) are the two largest stone loading ports on the Great Lakes, and the cement plant at Alpena is likewise the number one source of cement on the Great Lakes.

Commercial ships loading and unloading at these ports, as well as other ships transiting northern Lake Huron, conduct ballasting as part of routine vessel operations and safety. NOAA's Preferred Alternative addresses these circumstances Section IV (Description of Proposed Action and Alternatives).

Related to the shipping activities described above is the occurrence of "dry cargo residue." Dry cargo residue (DCR) is a product of using "bulk dry cargoes." According to the *Final Environmental Impact Statement: U.S. Coast Guard Rulemaking for Dry Cargo Residue Discharge in the Great Lakes (August 2008)*:

During ship loading or unloading operations, small portions of these cargoes often fall on ship decks or within ship unloading tunnels. Traditionally, Great Lakes shippers have managed DCR by periodically washing down both the deck and cargo unloading tunnels with water in a practice commonly known as "cargo sweeping." In order to reduce costs and minimize in-port time, ships typically conduct this cargo sweeping underway while traveling between ports, and the water and DCR together is washed off the ship and into the lake(that is, discharged).

The State of Michigan has determined that DCR sweeping is illegal in state waters. Because the sanctuary is jointly managed by NOAA and the state of Michigan, and because all bottom lands within the sanctuary are state owned, an expanded sanctuary will not alter this situation. The sanctuary has determined that dry cargo sweeping does not have an impact on maritime cultural resources. The USCG restrictions on the practice of washing down dry bulk cargo residue, known as dry cargo sweeping, apply within the original boundary of TBNMS (33 CFR §151.66). The proposed action does not result in any changes to the USCG regulations; therefore, current practices would not be impacted.

Physical and Biological Environment

Because the scope of Thunder Bay NMS regulations is limited to the protection of maritime heritage resources, there is no direct anticipated effect on the physical and biological environment. However, it is possible that valuable research opportunities on the physical and biological environment could increase, due simply to the broader awareness of the area brought forth by the sanctuary's presence. A similar trend has occurred in the current sanctuary, though the actual avenues of research in an expanded sanctuary are necessarily difficult to predict. A minor increase in charter boats catering to tourist activities may occur as a result of boundary expansion. Given that sewage discharges from vessels are not permitted in the Great Lakes and a handful of additional charter boats are a negligible increase when compared to the numerous recreational fishing boats, NOAA does not expect any impacts on the biological environment as a result of increased tourism. In addition, since the designation of the sanctuary in 2000, the main increase in tourism has been seen on land rather than in the sanctuary. Section V of this document identifies several potential consequences in an expanded sanctuary, based on experiences in the current sanctuary.

IV. Description of Proposed Action and Alternatives

This section describes the boundary expansion alternatives that NOAA is considering to meet the purpose and need for the proposed action. This section explains the process that led to development of the three final alternatives. The current alternatives were arrived at from boundary options as recommend by the Sanctuary Advisory Council during management plan review (2007), the result of public scoping meetings (2012), comments on the DEIS (2013) and amended rule (2014), and analysis by sanctuary historians and archeologists.

Development of Alternatives

NOAA selected the Preferred Alternative boundary after considering the alternatives put forth during the sanctuary's original designation (2000), as well as expansion alternatives later developed by the Advisory Council (2007), and finally after receiving considerable public input during public scoping meetings (2012), the public comment period on the DEIS (2013) and amended rule (2014). The amended rule, published on May 9, 2014 (79 FR 26654) addressed concerns from commercial shipping and regional Tribal fishers.

Historical and archaeological research conducted since the sanctuary's designation was used to establish the number and condition of resources within each alternative, as well as the historical, archeological and recreational significance of these sites. Nearly all of the known sites within the Preferred Alternative are eligible for listing on the National Register of Historic Places. This section summarizes the phases of analysis and input that led up to the selection of NOAA's Preferred Alternative. During each phase, similar boundary alternatives were considered and finally developed into the three alternatives currently under consideration.

Public interest in TBNMS boundary expansion was first expressed when NOAA re-proposed the sanctuary to the Governor of Michigan in 2005 (in accordance with 15 CFR 922.34). During the re-proposal process in 2005, the public was provided an opportunity to comment on how the sanctuary was being managed. NOAA also solicited public comments during the 2006 scoping process for management plan review. In both cases, NOAA received a number of comments expressing interest in boundary expansion to include Alcona and Presque Isle Counties. Several local government and non-governmental organizations including the City of Alpena, Alpena County, Alpena Township, Sanborn Township, Presque Isle Township, Rogers City, Alcona County, Michigan Sunrise Side Travel Association, and the Sunrise Side Coastal Highway Management Council passed resolutions or submitted written letters of support for expansion. Based on public interest, boundary expansion was identified as a priority issue for the sanctuary's management plan review. Letters of support can be found at: <http://thunderbay.noaa.gov/management/expansion.html>.

In 2007, as part of the management plan review process, NOAA established a sanctuary advisory council boundary expansion working group to evaluate whether the boundaries should be

expanded to protect, manage, and interpret additional shipwrecks and other potential maritime heritage resources, and to make a recommendation to the sanctuary advisory council.

The boundary expansion working group identified and considered the following study area for evaluation of boundary alternatives: a 4,110-square-mile area that extended the current sanctuary south into Alcona County, north into Presque Isle County, and east to the international border with Canada. The study area was identified based on the density of known and undiscovered resources, the historical, archaeological, and recreational significance of individual and collective resources, and the maritime landscape.

Sanctuary Advisory Council Boundary Evaluation and Recommendation

The boundary expansion working group evaluated three alternatives in the study area:

- A. No expansion (sanctuary remains at 448 square miles). The working group rejected the “no expansion” alternative based on its evaluation of the distribution of shipwrecks outside the sanctuary. The working group concluded that there were enough known and potential shipwrecks outside the sanctuary to justify expanding the sanctuary boundary. There are 45 known shipwrecks within the current sanctuary boundaries.
- B. Presque Isle Lighthouse in Presque Isle County south to Sturgeon Point Lighthouse in Alcona County, east to longitude 83 degrees west (808 square miles). The 808-square-mile area was evaluated because it was NOAA’s preferred boundary during the sanctuary’s initial designation in the year 2000. The area contains 60 known shipwrecks (15 additional shipwrecks than Alternative A). Approximately 64 undiscovered shipwrecks may be located in Alternative B, but limiting the sanctuary to the 808-square-mile area reduces the likelihood of inclusion of additional undiscovered shipwrecks. The working group rejected this alternative in favor of Alternative C because this alternative limited inclusion of known and undiscovered shipwrecks in the sanctuary.
- C. Alternative C is 4,110 square miles and contains 78 known and approximately 100 undiscovered shipwrecks. This alternative includes all sites within Presque Isle, Alpena and Alcona Counties and extends westward to the international border with Canada. Among the sites are a number of historically, archaeologically, and recreationally significant shipwrecks not currently included in the sanctuary. Based on the density of known and undiscovered resources, the historical, archaeological, and recreational significance of individual and collective resources, the maritime landscape, and the ease of identifying the sanctuary as a three-county area, the working group recommended Alternative C.

Ultimately, the working group felt it was important and practical for the sanctuary to expand to include Alcona, Alpena, and Presque Isle Counties and the U.S./Canada international border to

provide protection for those maritime heritage resources currently known and those yet to be discovered. The working group also felt that by expanding sanctuary boundaries to the study area, important national treasures would be protected through the sanctuary's research and monitoring, education, and resource protection programs (including law enforcement), while allowing recreational use of the resources. On May 22nd, 2007, the boundary expansion working group presented this recommendation to the SAC and the SAC passed a resolution that recommended expansion of the boundary to the area favored by the SAC working group.⁷ Based on this recommendation, two sanctuary expansion bills were introduced into the U.S. Congress by Senator Carl Levin. However, the bills were never brought to a vote.

In response to the Sanctuary Advisory Council's recommendation, the Thunder Bay NMS Final Management Plan (2009) contains a strategy (Strategy RP-1) to "Evaluate and assess a proposed expansion of the sanctuary to a 3,662-square-mile area from Alcona County to Presque Isle County, east to the international border with Canada to protect, manage, and interpret additional shipwrecks and other potential maritime heritage resources."

After issuing a Notice of Intent on April 12, 2012 (77 FR 21878), NOAA held three public scoping meetings in April 2012. The attendance at the three meetings was: Alpena (22), Harrisville (6), and Rogers City (14). In addition, NOAA received 21 letters and e-mails, with an additional seven comments submitted through the online portal. The overwhelming response by the public was support for boundary expansion. In addition, several people suggested that NOAA consider a slightly larger boundary north of the suggested boundary to protect an additional five historic shipwrecks. This larger area became the sanctuary's Preferred Alternative.

On June 14, 2013, NOAA published in the Federal Register notice of a proposed rule (78 FR 35776). An accompanying draft environmental impact statement (DEIS) (78 FR 35928) was published on the same day. As proposed, the rule would increase the geographic size of the sanctuary from 448 square miles to 4,300 square miles and more than double the number of nationally significant shipwrecks that are protected under the NMSA. The proposed boundary would extend from Alcona County, Michigan to Presque Isle County, Michigan, include selected submerged maritime heritage resources in Cheboygan and Mackinaw counties, and run east to the United States/Canada international boundary. The proposed expansion also includes the ports at Rogers City and Presque Isle.

Three public meetings on the proposed rule were held in July 2013 in Michigan, and the public comment period was extended on three separate occasions, eventually closing on December 19, 2013 (78 FR 49700, 64186 and 73112). NOAA extended the comment period to gather more information from stakeholders and consult with the U.S. Coast Guard (USCG) and U.S.

⁷ The SAC resolution recommended adding an area of 3,662 square miles. This area added to the existing sanctuary would result in a total sanctuary area of 4,110 square miles, which is the figure used throughout this document when referring to the SAC resolution.

Environmental Protection Agency (EPA), both of whom have regulations that apply to national marine sanctuaries. In response to public comments and information received, NOAA decided to amend the proposed rule and provide additional time for the public to submit comments on the proposed amendments.

On May 9, 2014, NOAA published an amended rule (79 FR 26654), followed by a 30-day comment period. The amended rule: a) proposed a new boundary for the sanctuary that would not include the ports at Rogers City, Presque Isle, and Alpena; 2) addressed questions and concerns related to ballasting in the expanded sanctuary; and c) clarified and updated TBNMS regulations pertaining to treaty fishing rights of area Indian tribes.

Boundary expansion has been under consideration for many years, and this action has garnered considerable support. The level of support is documented in letters, resolutions, Congressional testimony, and Sanctuary Advisory Council recommendations from the past five years, which are posted on: <http://thunderbay.noaa.gov/management/expansion.html>.

Description of Alternatives and Proposed Action

To provide protection for unique historic sites within the maritime landscape but beyond the current boundaries of the Thunder Bay National Marine Sanctuary, NOAA seeks to expand the current boundary from 448 square miles to 4,300 square miles. The current sanctuary contains 45 historic shipwrecks. The proposed expansion would protect an additional 47 known sites by including them in the sanctuary's well-established research, resource protection, education and outreach, and enforcement programs. Moreover, within the new boundary is the potential for the discovery of several dozen more shipwrecks, as well as related archeological sites such as docks, cribs, piers and prehistoric sites.

Table 2 and Figures 19 and 20 present the boundary expansion alternatives.

Table 2: Summary of known and suspected shipwrecks in each boundary alternative

	Total Area of Sanctuary (sq. mi.)	Known shipwrecks	Suspected shipwrecks
Alternative A (No Action, retain current boundary)	448	45	40*
Alternative B (Presque Isle Lighthouse to Sturgeon Point Lighthouse)	808	60 (adds 15 sites to existing sanctuary)	64* (adds 24 suspected shipwrecks)
Alternative C (NOAA's Preferred Alternative)	4,300	92 (adds 47 sites to existing sanctuary)	100* (adds 60 suspected shipwrecks)

*Approximate locations of undiscovered shipwrecks are based upon historic records.

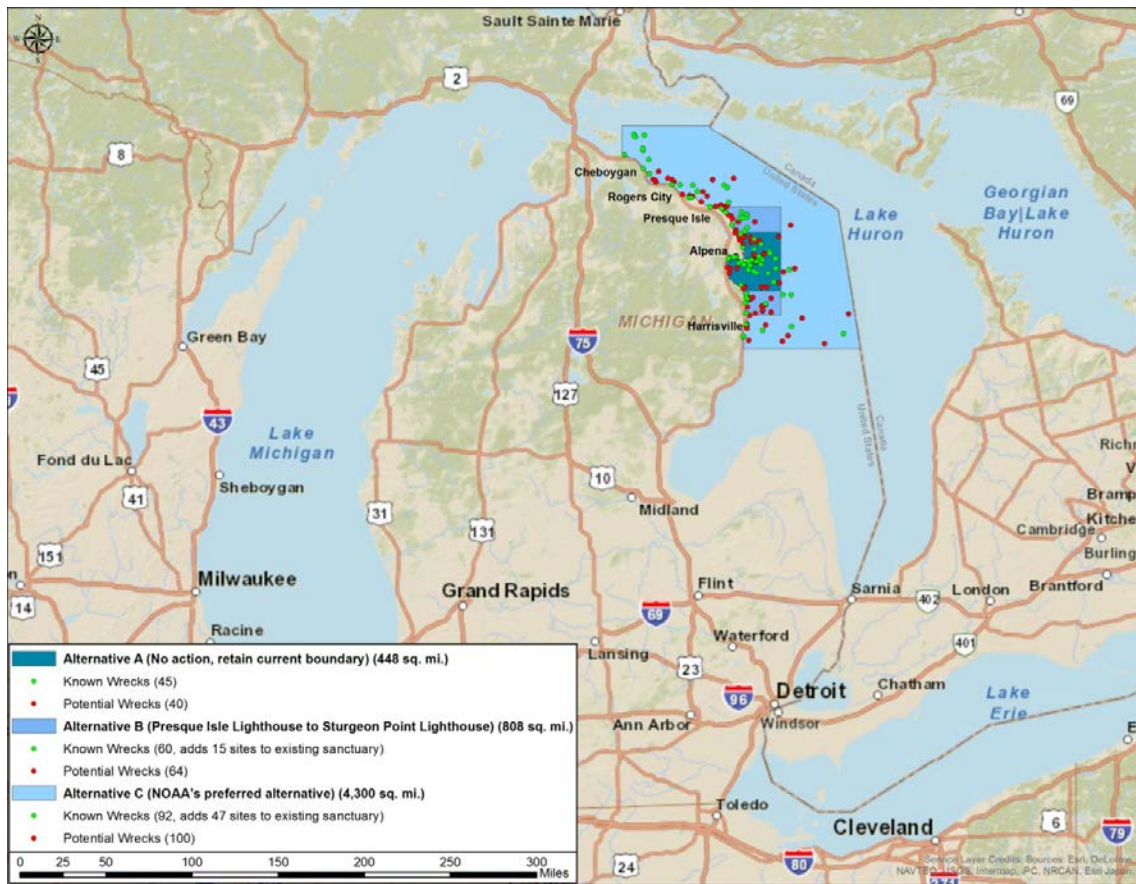


Figure 19: TBNMS boundary expansion options. Green dots represent known shipwrecks, red dots are potential shipwrecks (locations based on historical records).

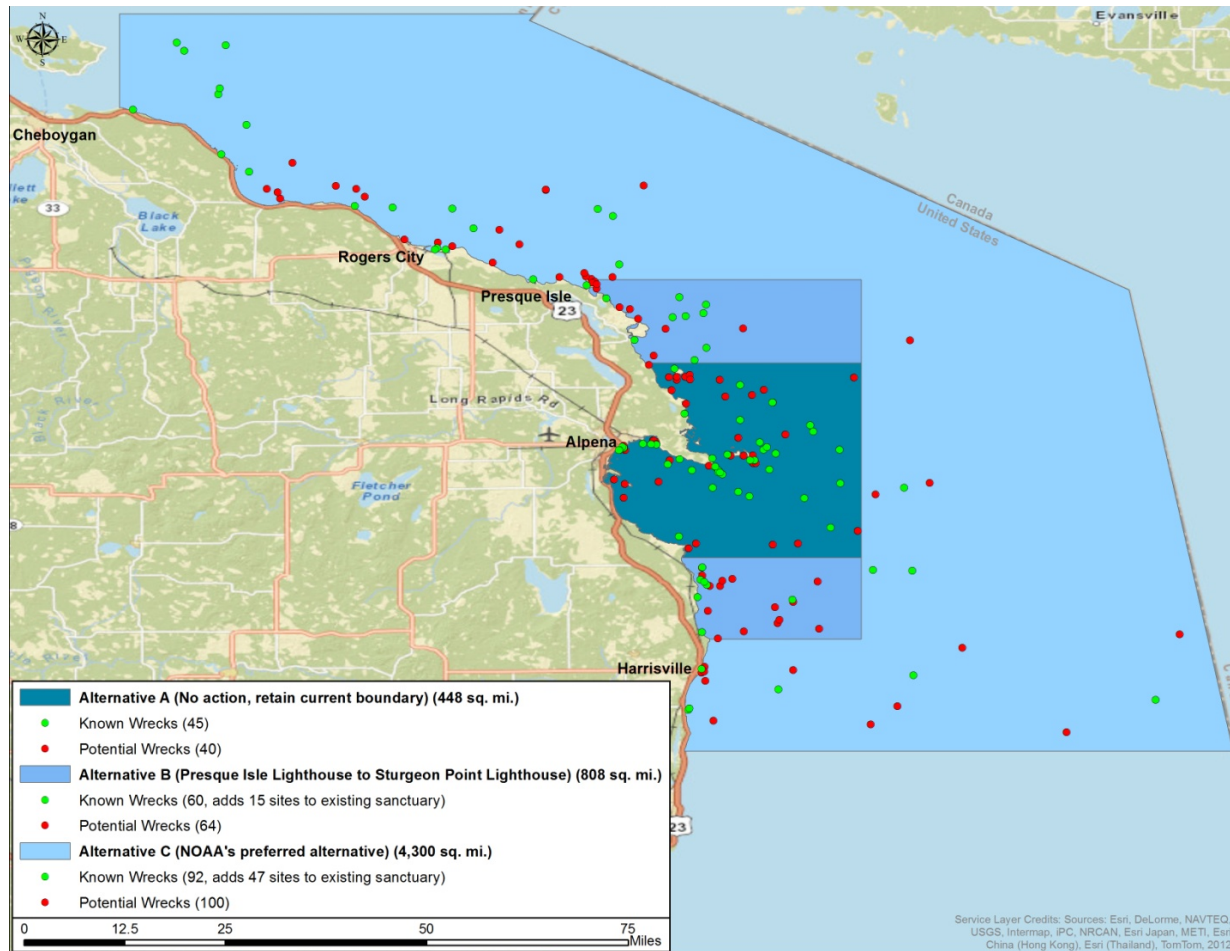


Figure 20: TBNMS boundary expansion options at closer scale. Green dots represent known shipwrecks, red dots are potential shipwrecks (locations based on historical records).

Alternative A (448 Square-Mile Boundary Alternative: No Action Alternative)

Under the no action alternative, NOAA would not expand the sanctuary's existing 448- square-mile boundary. The sanctuary's existing boundary extends lakeward to longitude 83 degrees west and is delineated to the north and south by the respective Alpena County lines. This 448-square-mile area contains 45 shipwrecks. Archival research indicates that as many as 40 shipwrecks are yet to be found in this area.

Alternative B (808 Square-Mile Boundary Alternative)

This 808-square-mile boundary alternative is defined by the Presque Isle Lighthouse in Presque Isle County, south to Sturgeon Point Lighthouse in Alcona County, east to longitude 83 degrees west. The area contains 15 additional shipwrecks than Alternative A, for a total of 60 known shipwrecks. Approximately 64 undiscovered shipwrecks may be located in this alternative. As indicated previously, the Sanctuary Advisory Council working group on boundary expansion evaluated the 808-square-mile area because it was NOAA's preferred boundary during the TBNMS designation process.

Alternative C (4,300 Square-Mile Alternative) (Preferred)

NOAA's preferred alternative is to increase the sanctuary boundary to 4,300 square miles. The preferred boundary alternative would add 47 shipwrecks to the existing boundary, and include 32 more shipwrecks than Alternative B. Significantly, NOAA's preferred alternative includes Rogers City, Presque Isle, and Harrisville as communities adjacent to the sanctuary boundary. The new boundary would include all 92 historic shipwrecks in Alpena, Alcona and Presque Isle Counties, and five shipwrecks from Mackinaw and Cheboygan Counties.

This alternative would contain all the sites in Alternatives A and B, and is significant for the additional inclusion of shipwrecks around Spectacle Reef, recent discoveries made by sanctuary staff, several intact sites off Alcona County, and the potential for new discoveries. Although additional shipwrecks sites exist outside this area, NOAA's proposed action contains the sites whose protection would best complement, from an archaeological, historical and recreational perspective, the resources in the current sanctuary boundaries.

During the scoping process, NOAA received a suggestion that five additional significant historic shipwrecks should be included in NOAA's boundary expansion. Adding these shipwrecks would result in an area slightly larger than the Sanctuary Advisory Council's preferred alternative of 4,110 square miles (approximately 215 additional square miles, for a total sanctuary area of 4,300 square miles). NOAA analyzed this alternative in the FEIS and is proposing it as the preferred alternative.

The southern boundary of the preferred alternative begins where the southern boundary of Alcona County intersects with the ordinary high water mark of Lake Huron and runs east until it intersects the U.S. / Canada international boundary. The eastern boundary of this preferred alternative

follows the international boundary until it intersects with the 45° 50'N line of latitude. The northern boundary follows this line of latitude (45°50'N) westward until it intersects the 84° 20'W line of longitude. The western boundary extends south along this line of longitude (84° 20'W) until it intersects the ordinary high water mark at Cordwood Point. From there, the western boundary follows the ordinary high water mark as defined by Part 325, Great Lakes Submerged Lands, of P.A. 451(1994), as amended, excluding the commercial ports at Rogers City (Calcite), Presque Isle (Stoneport) and Alpena (LaFarge), until it intersects the southern boundary of Alcona County. No known nationally significant shipwrecks or other maritime heritage resources occur in the ports excluded from the expanded sanctuary. A more detailed description of the boundary and a list of coordinates are set forth in the regulations for the sanctuary at 15 CFR part 922 subpart R.

NOAA chose to exclude the three ports mentioned above due to comments submitted by the Governor of Michigan, the Lake Carriers' Association, the Canadian Shipowners Association, the Shipping Federation of Canada, local government officials, other commercial interests, and members of the general public. They all requested these ports not be included within the boundary to avoid any restriction or prohibition on port operations "critical to the local, regional, and national economies." Specifically, these commenters indicated that expansion would restrict or prohibit ballasting operations for vessels transiting the sanctuary, given USCG and EPA requirements that require certain vessels equipped with ballast tanks to "avoid the discharge and uptake of ballast water in areas within, or that may directly affect marine sanctuaries, marine preserves, marine parks, or coral reefs."

Based on information in the written comments, other literature on Great Lakes ballasting, and input from USCG and EPA on their respective requirements (which continues in effect) NOAA believes ballasting operations, to include safety and to control or maintain trim, draught or stability of the vessel, are consistent with the maritime heritage protection mission of the TBNMS, and therefore, are an allowable activity within the proposed boundaries of the sanctuary.

As discussed above in the *Affected Environment* section, the State of Michigan has determined that Dry Cargo Residue sweeping is illegal in state waters. Because the sanctuary is jointly managed by NOAA and the state of Michigan, and because all bottom lands within the sanctuary are state owned, an expanded sanctuary will not alter this situation. The sanctuary has determined that dry cargo sweeping does not have an impact on maritime cultural resources. The USCG restrictions on the practice of washing down dry bulk cargo residue, known as dry cargo sweeping, apply within the original boundary of TBNMS (33 CFR §151.66). The proposed action does not result in any changes to the USCG regulations; therefore, current practices would not be impacted.

Based on government to government consultation with federally recognized Indian Tribes that fish in the current and expanded sanctuary, NOAA's Preferred Alternative would also clarify and update TBNMS regulations pertaining to treaty fishing rights of area Indian tribes. Specifically, NOAA would amend the TBNMS regulations in order to clarify that the exercise of Indian treaty fishing rights are not modified, altered, or in any way affected by the proposed boundary expansion. In particular, NOAA would add and define the term "treaty fishing rights" to the TBNMS definitions at

15 CFR 922.191. The definition was specifically suggested during tribal consultations undertaken pursuant to E.O. 13175 with the Chippewa Ottawa Resource Authority (CORA) which represents all 1836 treaty fishing tribes and contained in several written public comments received from a federally-recognized Indian tribe and an interested tribal resource agency. The purpose of the definition would be to clarify that the term “treaty fishing rights” refers to those rights reserved in the 1836 Treaty of Washington and in subsequent related court decisions because the tribes believe the existing TBNMS regulations are ambiguous. This definition would not replace, but would rather complement, the existing definition of “traditional fishing” which also refers to the 1836 Treaty of Washington currently codified in 15 CFR 922.191.

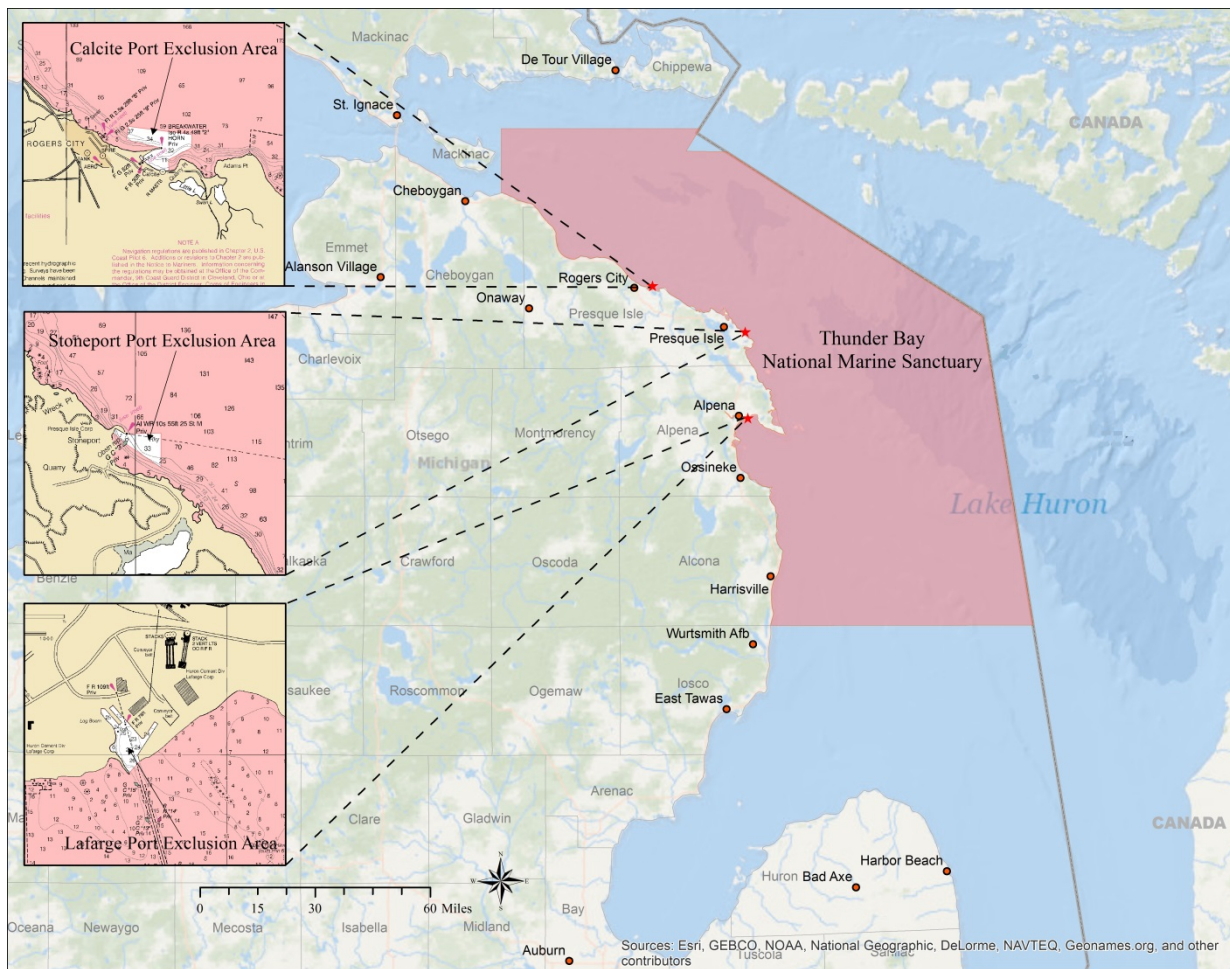


Figure 21: NOAA’s Preferred Alternative, showing three excluded commercial ports.

V. Environmental and Socioeconomic Consequences of Alternatives

Introduction

This section describes the anticipated environmental consequences of the preferred action and alternatives on the maritime heritage, physical and socioeconomic resources of TBNMS as described in the Affected Environment (Section III). The impacts are identified generally as either beneficial or adverse effects.

The chief benefit of sanctuary expansion is increased resource protection for as many as 47 additional historic shipwreck sites. Generally, the benefits of the three analyzed boundary alternatives relate proportionally to the number of shipwrecks that are in each alternative. (e.g. more resources would be protected in Area C, than Areas A and B (Table 3). Because many consequences are common to all of the analyzed alternatives, they are presented just once (see below), followed by a discussion of the unique consequences that would occur in each boundary alternative. The unique consequences of each boundary alternative are related to the number of sites within a particular boundary alternative, and the historical, archaeological and recreational significance of these sites.

Table 3. Summary of known and suspected shipwrecks in each boundary alternative.

	Total Area of Sanctuary (sq. mi.)	Known shipwrecks	Suspected shipwrecks
Alternative A (No Action, retain current boundary)	448	45	40*
Alternative B (Presque Isle Lighthouse to Sturgeon Point Lighthouse)	808	60 (adds 15 sites to existing sanctuary)	64* (adds 24 suspected shipwrecks)
Alternative C (NOAA's Preferred Alternative)	4,300	92 (adds 47 sites to existing sanctuary)	100* (adds 60 suspected shipwrecks)

*Approximate locations of undiscovered shipwrecks are based upon historic records.

Additionally, although the application of sanctuary regulations and resource protection programs to 47 additional shipwreck sites is the chief and most direct benefit of the preferred action, there are several anticipated economic (e.g. increased tourism) and environmental (e.g. increased multidisciplinary research) benefits as well. These consequences are common (though proportional) to each boundary alternative and discussed in the following section. Similarly, the consequences relative to the physical and biological environment are also common to each alternative, and summarized below.

Consequences Common to all Boundary Alternatives

Human Environment

Maritime Heritage Resources

Each boundary alternative would realize consequences (proportional to the number of shipwreck sites within it) through the application of the existing TBNMS Management Plan to that area. Primarily, this includes implementing the sanctuary's Resource Protection, Research, and Education and Outreach Actions Plans. Specifically, the anticipated benefits are:

Law Enforcement

There is existing Michigan state law and other applicable federal law regarding underwater cultural resources aimed at reducing the impact of human activities on historic shipwrecks and related maritime heritage resources. While those laws have been effective, they apply only to abandoned property. Sanctuary regulation in the proposed expanded area would provide increased protection by filling existing gaps in state law as follows:

- The sanctuary regulations would apply to all shipwrecks, not just abandoned shipwrecks.
- The use of grappling hooks or other anchoring devices is prohibited on underwater cultural resource sites that are marked with a mooring buoy.
- "Hand-taking" of artifacts outside the Thunder Bay Underwater Preserve, but still within the revised Sanctuary boundary, would be prohibited.
- Permit applications would be required to satisfy the Federal Archaeology Program guidelines for all sites located within the revised sanctuary boundary.
- As an additional enforcement mechanism, NOAA may assess civil penalties for violations of Sanctuary regulations and the National Marine Sanctuaries Act.

The enforcement of sanctuary regulations and state laws would require a sufficient on-water presence within the sanctuary. To accomplish this, the sanctuary partners with local, state and federal law enforcement agencies including NOAA's Office of Law Enforcement, the U.S. Coast Guard (USCG), Michigan Department of Natural Resources and the Environment (MDNRE), Alpena County Sheriff, and Michigan State Police. Coordination and communication among the several agencies involved in sanctuary law enforcement is critical. In 2006, the sanctuary established the Thunder Bay Law Enforcement Task Force to better coordinate enforcement efforts in the sanctuary. The task force focuses on improving public education and providing additional on-water and dockside patrols of the sanctuary. The benefits of this task force would extend to the expanded sanctuary.

In 2011, the USCG Alpena-Station was underway 94 times and logged over 260 hours in and around the sanctuary, including operating at least 15 days near Presque Isle, Michigan, an area under study for potential sanctuary expansion and a popular marina for dive boats. Also, the USCG Auxiliary was underway 10 times in the same area, operating four times out of Presque Isle. Additionally, a USCG cutter conducted law enforcement operations for one week in Thunder Bay. This on-water presence constitutes a significant piece of law enforcement for the current sanctuary, and this benefit would extend to an expanded sanctuary.

In May 2013, Thunder Bay staff and the Michigan State Underwater Archaeologist met with the United States Coast Guard (Alpena station and Sector Sault Ste. Marie Intelligence Operations), Michigan Department of Natural Resources Law Enforcement Division and Department of Homeland Security Customs and Border Protection to discuss ways to increase law enforcement presence in the expanded sanctuary area. Discussions centered on pooling and better coordinating existing resources such as regular USCG vessel transits through the expanded sanctuary.

Finally, facilitating continuing education for local law enforcement officials is an important aspect of sanctuary law enforcement. In 2005, the sanctuary hosted a maritime heritage law enforcement workshop for regional agencies, bringing experts from NOAA's Office of Law Enforcement to Alpena, Michigan. In 2006, the sanctuary superintendent and four members of the USCG-Alpena Station and MDNRE attended a submerged cultural resources law enforcement class sponsored by Biscayne National Park. Additionally, maritime heritage law is a key component of the sanctuary's Nautical Archaeology Society training. During these classes, students learned the basics in shipwreck-specific legislation and how it applies to the sanctuary. Members of the Michigan State Police have attended this training. In 2009, the NOAA Maritime Heritage Program sponsored a workshop on federal heritage law. The workshop focused on the National Historic Preservation Act's Section 106, which provides a process to ensure that federal activities are reviewed for potential impacts on state lands. The benefits of this type of training would extend to an enlarged group of law enforcement officials operating and collaborating in an expanded sanctuary.

Shipwreck Mooring Buoys

Due to the large number of easily accessible shipwrecks, the area in and around the sanctuary is a popular snorkeling and diving destination. The sanctuary encourages public access to its resources and strives to balance increased visitation with resource protection. Visiting dive boats and divers have the greatest potential to negatively impact the quality of sanctuary resources. Through its well-established mooring buoy program, TBNMS maintains and installs permanent U.S. Coast Guard approved mooring buoys at shipwreck sites to protect these often fragile resources (Figure 22).

Moorings are a fundamental resource protection strategy in four important ways: (1) they eliminate the need for a visiting dive boat to use its anchor to locate and secure itself to a fragile shipwreck site; (2) they eliminate the need for non-permitted moorings at shipwreck sites, which

can become derelict over time, posing a risk to divers and potentially damaging the site; (3) they make for safer diving by providing a sturdy means of descent and ascent for divers, and an easy-to-find surface marker for kayakers; and (4) encourage public accessibility.

The sanctuary installed its first shipwreck mooring system in 2003; there are currently 32 moorings installed at 29 sites (some sites are large enough to require two moorings). Because the moorings are deployed seasonally to avoid ice damage, the sanctuary's website provides divers with the up-to-date status of each mooring.

Significantly, sanctuary regulations prohibit the use of grappling hooks or other anchoring devices on maritime archaeological resource sites if a mooring buoy is available at the site. This provision only applies to sites within sanctuary boundaries. Consequently, increasing the number of shipwrecks within the sanctuary's boundaries would enable both the installation of moorings at more shipwrecks sites, and the enforcement of the provision mentioned above.



Figure 22. Permanent moorings at sanctuary shipwrecks sites are a primary means of resource protection.

Research

Applying the sanctuary's Research Action Plan to the preferred boundary alternative would bring a larger number of historically, archaeologically and recreational significant shipwrecks under the umbrella of sanctuary research and characterization. In this sense, the timing for expanding the sanctuary to include more sites in its research program is excellent: as of 2011, three hundred sixty-one square miles have been surveyed within the sanctuary's existing 448-square-mile boundary, and 44 of the 45 known historic shipwreck sites in the existing boundary have been assessed by sanctuary archaeologists. The sanctuary's research program is poised to include more sites.

Research and characterization form the foundation of the sanctuary's resource protection efforts, and underpin responses to specific pressures on sanctuary resources. Characterization is the

process through which resources are located, inventoried, assessed and ultimately analyzed within a broader historical, archaeological and resource management context. Characterization is accomplished through a variety of research methods, from archival research to remote sensing and individual site assessment and documentation. Characterization makes informed resource protection possible because it widens the view for resource managers, allowing research efforts to be prioritized. Including the additional 47 known historic shipwreck sites in the preferred alternative would increase research at these new sites, which in turn would allow for better resource management.

Archaeological and historical research is also at the heart of the sanctuary's exhibits, education initiatives and public programming, all of which are designed to foster greater public awareness and appreciation for the Great Lakes and their rich maritime history. Bringing additional shipwreck sites into the sanctuary's research program would in turn lead to these sites being more meaningfully included in the sanctuary's education and outreach efforts (see below).

Notably, much of the sanctuary's research is made possible with grants and other outside funding — since 2005, the sanctuary has obtained more than \$435,000 from external sources for on-water research and resource protection, greatly supplementing its core resource protection budget. These added research dollars have helped to better research-and ultimately protect- sanctuary shipwreck sites. This benefit would extend to the additional shipwrecks included in an expanded sanctuary boundary.

Resource Protection through Diver Education and Conservation Awareness

Ultimately, resource protection is a shared responsibility between the sanctuary and a wide range of stakeholders. At the front lines of this effort are divers who visit sanctuary sites. Beyond their value as archaeological and historical sites, shipwrecks sites within the current sanctuary and Preferred Alternative are popular recreational sites. They also constitute an important asset for local and regional diving charter businesses. Fostering appreciation for sanctuary resources among divers is fundamental to reducing human impacts at these unique, irreplaceable sites. Divers, and other stakeholders, will protect what they value.

To preserve the archaeological, historical and recreational integrity and value of these sites, the sanctuary couples its regulations with targeted education and outreach. Poor diving practices by divers (e.g. moving or inadvertently damaging artifacts), and souvenir hunting and looting represent significant impacts to existing sanctuary resources (Figures 23 and 24). Additionally, new shipwreck discoveries continue to occur, opening up the potential for irreversible diver impacts at previously undisturbed sites.

Although sanctuary regulations and Michigan law prohibit moving artifacts, the practice still occurs at many sites where divers want to gain better viewing and photography opportunities. Clearly

unacceptable is the handling and relocation of human remains. Thirteen sites in NOAA's preferred alternative have the potential for human remains, and visible remains have been reported at several sites. (NOAA Thunder Bay NMS, 2005 and 2011).



Figure 23. Left, moved by divers from their original disposition on the wreck of the steamer *Pewabic* (located in the current sanctuary boundaries), several artifacts such as copper ingots and ceramic cups and plates have been placed on deck and are more likely to be looted. Right, a diver swims between decks of the steamer *Florida* while hovering above are several air-tight barrels still buoyant after 114 years. Resting upright in 200 feet of water, the wooden package freighter's hold is still stacked with cargo.



Figure 24. Left, the cabin skylight on the deck of the schooner *Defiance* (1848-1854) was in place in 2005. Sometime after the 2005 photo was taken, the fragile skylight was displaced, as indicated in the photo at right taken from a diving-related website.

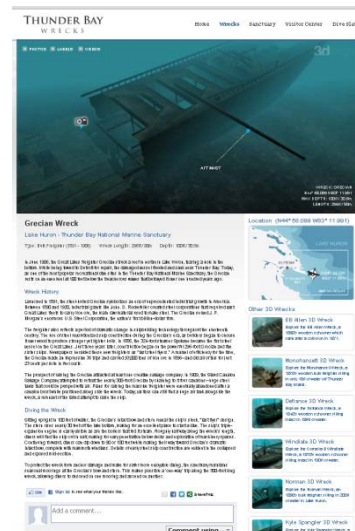
The sanctuary conducts substantial education and outreach activities designed to reach multiple audiences including educators, students, tourists and the local community, among others.⁸ National and regional diving trade shows, maritime archaeological workshops and academic symposiums are important venues to meet with divers. These events and activities provide opportunities to discuss concerns in the dive community, reinforce the benefit of responsible diving through presentations and outreach literature, and build partnerships. Since 2004, sanctuary archaeologists

⁸ In 2011, the sanctuary's Great Lakes Maritime Heritage Center welcomed nearly 70,000 visitors. Tailored programs aimed at K-12 students reached approximately 2,700 local students, while additional specialized programming for all ages and interties reached an additional 6,800. Learn more about the sanctuary's education programs in the 2009 Final Management Plan and www.thunderbay.noaa.gov/education.

have staffed informational booths and given presentations at many regional and national venues, including *Gales of November* (Duluth, Minn.), *Dive into the Past* (Minneapolis/St. Paul, Minn.), *Ghost Ships Festival* (Milwaukee, Wisc.), *Our World Underwater* (Chicago, Ill.), *Great Lakes Shipwreck Festival* (Ann Arbor, Mich.), *Boston Sea Rovers* (Boston, Mass.), and the *Society for Historical Archaeology Annual Conference* (various national locations). Sanctuary staff also attend several of these events annually. In 2011, sanctuary archaeologists gave presentations and staffed informational booths at three major Midwest diving trade shows with an overall attendance of over 11,000 people.

Reaching a wider diving audience is also important, as the sanctuary seeks to deliver its preservation message via larger outlets and promote diving and tourism in the region. Since 2004, the sanctuary has facilitated and been featured in a number of television and film projects aimed at both diving and general audiences. These include: History Channel (*Deep Sea Detectives: Great Lakes Ghost Ship*), Jean-Michel Cousteau's Ocean Futures Society (*America's Underwater Treasures*), National Geographic Channel (*Drain the Great Lakes*), Radical Media/Current TV (*Project Shiphunt*), Discovery Channel Canada (*Daily Planet*), the Science Channel (*Great Lakes Shipwrecks*), and public television (*Tragedies in the Mist*).

Creating an increased sense of value toward sanctuary resources requires providing meaningful products that both facilitate public access and reinforce responsible diving. Consequently, many of the sanctuary's research products are repurposed as outreach material specifically for divers. For example, 17 of the sanctuary's archaeological site maps can be downloaded and printed via the sanctuary's website, and several have been rendered as computer animations and 2D graphics for dive planning (Figures 25 and 26). Divers can access these on the sanctuary's website, where they will also find coordinates, images and diving-related information on 69 shipwrecks in and around the sanctuary.



Figures 25 and 26. In 2004, graduate students from East Carolina University documented the steamer *Monohansett*, resting in shallow water in the sanctuary. Using this data, sanctuary partner Fourth Element created a printable 2D graphic (left). These can be viewed online at <http://thunderbaywrecks.com> and <http://thunderbay.noaa.gov>. (NOAA/Fourth Element)

Involving divers directly in the documentation of shipwreck sites help foster a preservation ethic, while also expanding the sanctuary’s research capabilities. Using the Nautical Archaeology Society’s curriculum and certification, the sanctuary has trained 69 divers in archaeological field methods.⁹ During this hands-on archaeological training experience, students learn about historic preservation, maritime archaeological law and sanctuary-specific resource protection efforts. These “citizen scientists” include local residents, as well as members of the Michigan Underwater Preserve Council, Michigan State Police, U.S. Naval Sea Cadets and National Association of Black SCUBA Divers. Expanding the sanctuary to include the additional 47 historic shipwreck sites in the preferred alternative would both increase the number and range of volunteer opportunities, and also receive the benefit of being included in the sanctuary’s effort to foster a greater preservation ethic among divers.

Resource Protection through Partnerships

The sanctuary relies heavily on the work of others to help respond to pressures on its resources. Many groups and individuals impart energy, expertise, and equipment critical to sanctuary resource protection. Leveraging these partnerships is critical to the sanctuary’s successful and sustained management of its resources. Still other partners have their own research objectives, aimed at both cultural and natural resources, and the sanctuary actively supports these efforts. The benefit of partnerships in an expanded sanctuary is two-fold: (1) many existing partners would bring their expertise to bear on the study and management of the larger sanctuary and its resources; and (2) new partnerships would be cultivated that help address resource protection challenges unique to the expanded area.

⁹ See <http://www.nauticalarchaeologysociety.org/content/what-nas-training-programme>.

A research partner's presence in Alpena (and the region) also has an important effect on the local economy, further strengthening the sanctuary's tie to the community. In 2011, ninety-eight individuals spent 278 overnight-stays in the Alpena area in support of sanctuary-related work. This benefit would extend to a larger sanctuary.

The list below represents many of the TBNMS research partners to date:

- Cooperative Institute for Ocean Exploration, Research and Technology
- Dr. Robert Ballard's Institute for Exploration
- East Carolina University, Program in Maritime Studies
- East Carolina University, Diving and Water Safety Program
- Grand Valley State University, Annis Water Resources Institute
- Great Lakes Naval Memorial and Museum
- Michigan Department of Environmental Quality
- Michigan Department of National Resources
- Michigan Underwater Preserve System
- National Association of Black Scuba Divers
- NOAA, Great Lakes Environmental Research Laboratory
- NOAA, National Geodetic Survey, Remote Sensing Division
- NOAA, National Undersea Research Center
- NOAA, Office of Coast Survey, Navigation Response Team
- Noble Odyssey Foundation
- PAST Foundation
- University of Connecticut, Marine Sciences Program
- University of Michigan, Anthropology Department
- University of Michigan, Geomicrobiology Lab
- University of Michigan, Marine Hydrodynamics Lab
- University of Michigan, Naval Architecture and Marine Engineering
- University of Michigan, Perceptual Robotics Lab
- University of North Carolina, Coastal Studies Institute
- University of Rhode Island, Joint Program in History/Archaeological Oceanography
- University of Texas at Austin, Applied Research Lab
- University of Vermont, The Rubenstein School of Environment and Natural Resources
- University of Wisconsin-Stout, Biology Department
- U.S. Naval Sea Cadets-Great Lakes Division
- U.S. Coast Guard-Alpena Station
- Woods Hole Oceanographic Institution

Notably, the sanctuary also cultivates partnerships that enhance the protection of other types of maritime heritage assets important to the sanctuary and community. For example, since 2003, the

sanctuary has partnered with the Alpena County George N. Fletcher Public Library to jointly manage and make available to the public, the Thunder Bay Sanctuary Research Collection. The collection includes more than 1,000 published works, 80,000 photographs, 56 linear feet of vertical files, 40 feet of periodicals, 100 navigation charts, 350 shipbuilding plans, various manuscripts, and files on more than 20,000 Great Lakes watercraft.

Because it is a significant sanctuary resource and open to the public, a major focus has been to digitize the collection. A \$235,000 grant from the Michigan Department of History, Arts, and Libraries, nearly \$160,000 from the NOAA Climate Database Modernization Program and hundreds of volunteer hours made possible the creation of an online database of 17,000 vessels and related photographs. An expanded sanctuary would necessarily increase the number of opportunities for this type of resource protection partnership (see also Recreation and Tourism below).

Education and Outreach Directed at the General Public and Students

The sanctuary's Education and Outreach Action Plan enhances public awareness, understanding, and stewardship of the sanctuary, the Great Lakes and the ocean. Sanctuary education and outreach programs are designed to raise public awareness about the sanctuary and its resources, encourage public involvement in resource protection, increase knowledge about Great Lakes maritime history, and expand ocean and Great Lakes literacy. Expanding the sanctuary to include more sites would bring greater public attention to these sites and ensure their inclusion in sanctuary education and outreach efforts.

Education and outreach at Thunder Bay National Marine Sanctuary includes both formal programs for learners of all ages and informal programs for sanctuary visitors and constituents, including user groups impacting sanctuary resources. Education and outreach at the sanctuary also includes promotion of the sanctuary, the Great Lakes Maritime Heritage Center, and the Great Lakes Maritime Heritage Trail.

While education and outreach efforts are concentrated in and around the Great Lakes Maritime Heritage Center, they extend out to the region, state, and nation with initiatives in maritime heritage, archaeology, and ocean and Great Lakes literacy. Various strategies, from curriculum resources and traveling exhibits to eco- and heritage - tourism partnerships, allow the sanctuary to efficiently and effectively carry out its education objectives.

Sanctuary education initiatives reach a large number and wide variety of stakeholders. The sanctuary's Great Lakes Maritime Heritage Center (GLMHC) welcomed over 84,000 visitors in 2012. Additionally, in 2012, over 4500 pre-K through college students participated in educational programming that features Thunder Bay National Marine Sanctuary resources and nearly 12,000 individuals participated in specialized/targeted GLMHC programming. Also in 2012, over 1,800 local students participated in specially developed watershed or on-water programming. Through a

variety of successful partnerships and relying on over 2000 volunteer hours annually, the sanctuary is engaging the stewards of tomorrow by providing primary school students with place-based meaningful watershed experiences, high school students in Alpena may now take an elective science course that features TBNMS called, “Shipwreck Alley,” and the sanctuary was recently asked by the Michigan STEM Hub Network to head up training educators in Remotely Operated Vehicle (ROV) technology.

Additional Maritime Heritage Sites and the Cultural Landscape

The maritime cultural landscape includes maritime heritage resources other than historic shipwrecks (the primary focus of TBNMS). With many additional miles of shoreline and the addition of several small communities, maritime cultural landscape features are more numerous (including lighthouses). The inclusion of the coastal communities of Rogers City and Harrisville would provide “anchor” points to the sanctuary, as these communities have a strong maritime history. There would also be greater shore-based access to the shipwrecks (e.g., marinas in Rockport, Rogers City). The Great Lakes Maritime Heritage Trail, which is currently located in Alpena County, would likely be expanded north and south to reach other coastal communities. This is one example of the anticipated investment in the additional coastal communities due to sanctuary expansion.

Recreation and Tourism

It is expected that the expanded sanctuary would draw more divers and tourists to the area, although the Great Lakes Maritime Heritage Center in Alpena, would continue to be the main tourist destination. Businesses that relate directly to the TBNMS, such as the glass-bottom boat charter, would likely see an increase in visitors and could potentially expand to the other coastal communities.

In each of the boundary alternatives, there is no anticipated negative consequence to recreation and tourism. Based on experiences within the existing sanctuary (summarized here), there are several potential positive consequences to sanctuary expansion:

Fishing

Commercial and recreational fishing and boating are potential stressors to sanctuary maritime archaeological resources, with the biggest threat being damage resulting from deploying, dragging and recovering anchors and nets. Although impacts from fishing lures from trolling is possible (e.g., drifting and anchored fishing boats can become snagged in wrecks sites and potentially damage a fragile site), the potential impact is slight. Derelict lines and lures pose a potential hazard to scuba divers. Although gillnet remnants are known to exist at a couple shipwreck sites in the sanctuary, the future threat is not great given the limited number of commercial fishers in the area and the prohibition of gillnets in U.S. waters of Lake Huron south of Hammond Bay. In addition, Native American and commercial fishermen avoid known wreck sites, as they are hazards to fishing gear.

In each of the boundary alternatives, there is no anticipated consequence to fishing. However, because NOAA's Preferred Alternative encompasses a large area that is fished by Indian tribes, several aspects of Indian fishing have been clarified in NOAA's Preferred Alternative (see Section IV. *Description of Proposed Action and Alternatives*). The language agreed upon between NOAA and tribal fishers was a result of positive government to government consultation. Consequently, NOAA does not anticipate a negative impact on Indian fishing.

Shipping

As indicated in Section III. *Affected Environment*, commercial shipping on the Great Lakes carries the raw materials that drive the nation's economy. Many of these ships pass through the proposed expansion area. To avoid any unintended negative impacts to commercial shipping, NOAA worked with potentially affected stakeholders and relevant federal agencies to ensure that commercial shipping practices would remain unhindered in the expanded area. This was accomplished chiefly by not including the commercial ports of Alpena, Presque Isle and Rogers City in the new sanctuary boundary. In its final rule, NOAA also indicates that normal ship operations are not incompatible with sanctuary resource protection.

Because the State of Michigan has determined that dry cargo residue (DCR) sweeping is illegal in state waters, none of the boundary expansion alternatives would have an impact on this activity. Because the sanctuary is jointly managed by NOAA and the state of Michigan, and because all bottom lands within the sanctuary are state owned, an expanded sanctuary will not alter this situation. The sanctuary has determined that dry cargo sweeping does not have an impact on maritime cultural resources. The USCG restrictions on the practice of washing down dry bulk cargo residue, known as dry cargo sweeping, apply within the original boundary of TBNMS (33 CFR §151.66). The proposed action does not result in any changes to the USCG regulations; therefore, current practices would not be impacted.

Physical and Biological Environment

As indicated in Section III. *Affected Environment*, sanctuary regulations pertain only to maritime heritage cultural resources. However, the presence of the sanctuary has in the past encouraged multidisciplinary research, and at times the sanctuary has provided logistical and operational support for this research. Three examples are cited here, as these are important avenues of research that could occur in an expanded sanctuary.

Invasive Species

Aquatic non-indigenous species can negatively impact ecosystem structure, shipwrecks and other maritime archaeological resources (EPA 2008, ONMS 2009). Since the 1800s, human activities have caused the introduction of more than 200 exotic aquatic organisms of all types into the Great Lakes. Invasive zebra and quagga mussels have had an exceptionally significant impact on shipwrecks 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 shipwreck sites. Today, however, sanctuary archaeologists have observed significant zebra and quagga mussel infestation on shipwrecks sites as deep as 300 feet.

Although invasive mussels settle on all hard substrates, it has been documented that they appear to prefer wrought iron and steel surfaces (Watzin et al. 2001). As a result, there is concern over the effects of the spread of their colonization on shipwrecks. The latest lake-wide survey of quagga mussels, which included sites within the sanctuary, showed that mussel abundances increased twofold between 2003 and 2007 at depths greater than 50 meters, and about fourfold at depths between 51-90 meters (T. Nalepa, NOAA GLERL, unpubl. data).

The initial impact of mussel attachment is the loss of “archaeological visibility” – the surfaces of a historic shipwreck can literally disappear under layers of mussels (Kraft 1996, Watzin et al. 2001). While the shape of the shipwreck is still recognizable, the details of its surface and construction are obscured, thus severely impacting the ability to study these resources (Figures 27 and 28). Infestation of zebra and quagga mussels could also diminish the interest in diving on these wrecks, resulting in an adverse economic impact in the area through loss of tourism (Black et al. 2000). The weight of these mussels can also affect the structural integrity of the wrecks causing portions to break off or



Figure 27. The nameboard of the schooner *Kyle Spangler* (1854-1860; 185 foot depth) in 2003 was vivid in its detail. In 2011, the carved relief of the wooden nameboard shows visible signs of wear, as divers brush away stubbornly attached quagga mussels to get a photo opportunity. This site is located in NOAA’s Preferred Alternative. Stan Stock (2003) and NOAA (2011).

collapse. Also, removing mussels from the surfaces of these resources could result in further damage and loss (Watzin et al. 2001). Finally, when mussels colonize steel structures such as walls, pipes, and iron fasteners and fittings on shipwrecks, the iron and steel corrodes at a significantly accelerated rate as compared to ferrous material not encrusted with mussels (Watzin et al. 2001). Since many of the wooden ships in the Thunder Bay sanctuary are primarily iron and steel fastened, the structural integrity of these resources could potentially be compromised (Watzin et al. 2001).

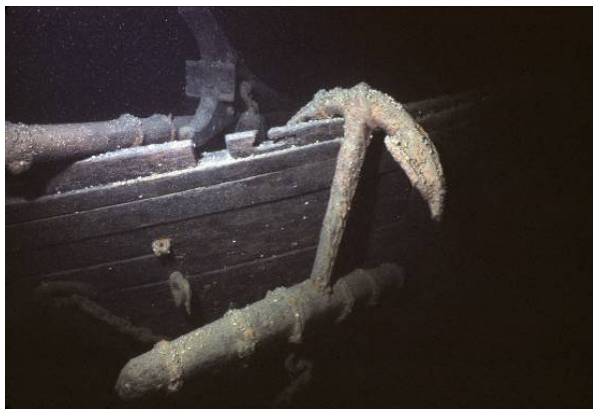


Figure 28. Left, a 2003 image of the anchor stowed on the port rail of the schooner *Kyle Spangler*, resting in 185-feet of water. Only a few quagga mussels are present. The variety of wood and iron features, many quite small but still easily made out, are a testimony to the preservative qualities of the Great Lakes cold, fresh water. Photo by Stan Stock. Right, a 2008 photo of the same anchor from a similar perspective. Many features are now obscured and have been since 2005. Quagga mussels completely cover the iron shank and flukes, as well as the iron anchor chain. Notably, the two small iron rings, presumably used as part of the apparatus to secure the anchor, are nearly undetectable.

Regionally, the sanctuary is working to develop and support partnerships with multi-disciplinary researchers and organizations to study Great Lakes ecology including the study of invasive species. From 2008 to 2010, the sanctuary research team conducted a series of dives in Saginaw Bay to support mussel sampling efforts by NOAA's Great Lakes Environmental Lab (GLERL) and several partner organizations. Begun in 2007, the five-year project is studying the complex multiple stressors impacting the Saginaw Bay ecosystem. The research is being used to develop, evaluate and operationalize GLERL's Adaptive Integrated Framework, using Saginaw Bay as a blueprint that can be applied at other coastal systems facing similar stressors and management issues. Partners include the University of Michigan, Michigan State University, University of Akron, Limno-Tech, Western Michigan University, Michigan Department of Natural Resources, and Michigan Department of Environmental Quality. Sampling by sanctuary divers provides data critical to the project's invasive mussel component.

In 2012, as part of GLERL's Long-Term Ecological Research program, the mussel sampling model used and refined in Saginaw Bay were implemented in Thunder Bay. This effort coincided with the broader Lake Huron Coordinated Science and Monitoring Initiative (CSMI), which has a significant Thunder Bay component in 2012.¹⁰ Among other research objectives, the CSMI aims to understand the impact of invasive species in Thunder Bay. The sanctuary supports the CSMI and its many partners by providing divers, research vessels, lab space and living quarters. Notably, the 2012 GLERL and CSMI efforts represent a significant milestone in the study of the Thunder Bay ecosystem, and one that is occurring in part because of the sanctuary's presence in Alpena. Supplementing ongoing research by the Michigan DNRE, U.S. Fish and Wildlife Service and U.S. Geological Survey, the CSMI effort represents the first step in a longer-term process of coordinated Lake Huron monitoring by multiple agencies.

¹⁰ The CSMI is a bi-national effort between Canada and the U.S. to jointly address the top science and monitoring priorities for the Great Lakes on an individual lake level. Priorities are identified by the Lakewide Management Plan management committees and coordinated through a bi-national CSMI Steering Committee.

Most, if not all of the shipwreck sites in each boundary alternative are colonized by invasive mussels. Consequently, these sites will benefit from sanctuary's current efforts and partnerships focused on invasive mussels. Additionally, the sanctuary's presence has precipitated a new focus on invasive mussels in northern Lake Huron. Expanding the sanctuary's boundaries is likely to enhance further research on the impact of invasive mussels on both shipwrecks and the natural environment.

Submerged Sinkholes

Submerged sinkholes are present in the sanctuary and support a specialized local ecosystem (Figure 29). Thousands of years ago, Lake Huron's limestone bedrock was exposed to extremely low lake levels following the last glacial maximum. Karst sinkholes were created between 10,000 and 8,000 years ago when a chemical reaction between limestone and acidic water dissolved away passages or holes in the rock, leaving behind weakly supported ceilings that could easily collapse or sink. The Lake Huron sinkholes were subsequently covered with water and are currently seeping groundwater to the bottom of the lake, providing a unique habitat for aquatic life. Researchers are now considering the Lake Huron sinkholes to be analogous to marine vent ecosystems – freshwater biogeochemical “hot spots” where nutrients recycle rapidly and where novel organisms and community processes may be observed (Voorhies et al. 2012).¹¹

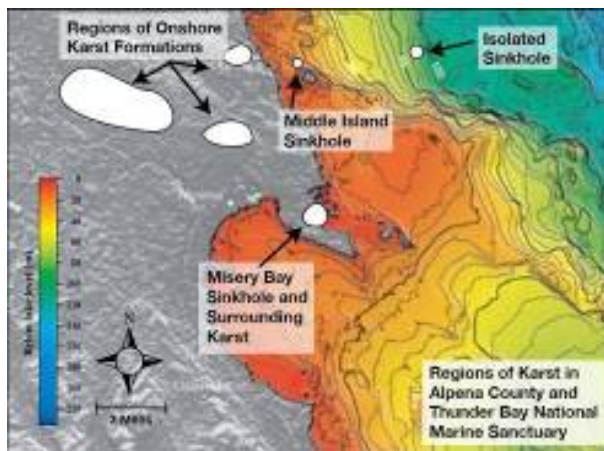


Figure 29. Above-ground offshore karst formations and submerged sinkholes in Thunder Bay National Marine Sanctuary.

In an ongoing effort to support and facilitate multidisciplinary research at the Middle Island submerged sinkhole, the sanctuary's research team regularly conducts scientific dives for researchers from Grand Valley State University's Microbial Biology Lab, the University of Michigan's Geomicrobiology Lab, the University of Wisconsin-Stout, and NOAA's Great Lakes Environmental Lab as they continue to characterize the specialized ecosystem present at the Middle Island sinkhole. As additional sinkholes are discovered in the potential expanded area, sanctuary resources may be brought to bear of this important avenue of research.

¹¹ For a more general overview see Doermann 2012.

Great Lakes Water Levels

The Great Lakes, their connecting waterways, and their watersheds, comprise the largest surface freshwater system on the planet. The monthly, seasonal, and annual surface water elevations of the lakes fluctuate in response to a variety of factors.

Great Lakes water levels are at their lowest level since the mid-1960s. According to the U.S. Army Corps of Engineers (January 2013), the water level of Lake Superior is 1 inch below its level from one year ago, while Lake Michigan-Huron is 17 inches lower. Lakes St. Clair, Erie, and Ontario are 20, 23, and 15 inches lower, respectively, than their levels of a year ago. Over the next month, Lake Superior is forecasted to drop 3 inches from its current level while Lake Michigan-Huron is expected to fall 1 inch. A continued lack of rain and snowfall in the Great Lakes basin will lead Lakes Huron and Michigan to break the record monthly low set in March 1964 — 576.05 feet above sea level — while all of the lakes are predicted to see lower-than-normal water levels.

There is a direct link between low water levels and the deterioration of shipwrecks. As water levels drop, shallow water shipwrecks become more exposed to air, waves and ice, thus accelerating natural decomposition. Nearshore shipwrecks in sandy lakebed environments may suffer increased deterioration as increasingly mobile sediment (due to a more dynamic environment created by lower water levels) variously exposes and buries sites. Moreover, the sudden occurrence of a shallow-water shipwreck exposed by shifting sediment makes for an exciting discovery, but one that is also potentially very accessible, and can lead to both intentional and unintentional human impacts including looting.

In 2013, as Great Lakes water levels reach an historic low, the sanctuary began a program of using volunteers to locate, assess and document newly exposed cultural resources. Sanctuary staff analyzed the coast line and prioritized areas of concern (i.e. publicly accessible beaches, areas where known shipwrecks occurred just off shore, etc.). Volunteer teams are given training, documentation forms, GPS and a camera, and each team's results are logged and tracked by the sanctuary. This program would be applied to an expanded sanctuary.

Consequences Unique to Each Boundary Alternative

The unique consequences relative to each boundary alternative are the number of sites within each alternative, and the historical and archaeological significance of those sites. The sections below highlight these important aspects of each alternative.

Boundary Alternative A (No Action Alternative)

Taking no action would result in no change of the current management regime of the sanctuary. The Thunder Bay National Marine Sanctuary would continue to implement its management plan, including the action plans related to resource protection, research, and education would be applied

in the existing boundary (Final Management Plan, 2009). The maritime heritage resources within the existing 448 square-mile boundary would continue to be protected by the TBNMS regulations.

This “no action” alternative would result in the status quo for conducting research, resource protection and education programs at TBNMS. This action would not protect additional shipwrecks and would not enhance existing education and research programs. Only the city of Alpena would be immediately adjacent to the boundary (Rogers City and Harrisville would continue to be outside the boundary). Because of the many historically, archeologically and recreationally significance shipwrecks beyond the sanctuary’s current boundaries, and in response to public input regarding the socioeconomic benefits of sanctuary expansion, this alternative is not preferred.

Under the no action alternative, there are no social or economic consequences expected because no additional waters would be designated as a national marine sanctuary. It has no impact on socioeconomic or human uses within the sanctuary. The Great Lakes Maritime Heritage Center continue to operate as the visitors’ center, Alpena would be the only coastal community adjacent to the boundary, and tourism-related activities, such as diving and glass-bottom boat tours, would operate in sanctuary waters.

Maritime Heritage Resources

As mentioned above, it is the number and historical, archeological and recreational significance of the sites within each boundary alternative that makes each alternative unique (Figure 30). The following are the significant sites with Alternative A:

Among the notable shipwrecks in this Alternative are the paddlewheel steamers *New Orleans* (1838-1849; 15 foot depth) and *Benjamin Franklin* (1842-1850; 15 foot depth), the two earliest shipwrecks in the sanctuary. North Point Reef, a geologic feature that extends over one mile from shore and rises to within five feet of the surface was a significant hazard to navigation and contains the remains of many shipwrecks. The wooden “steam barge” *Galena* (1857-1872; 16 foot depth) went ashore on North Point carrying 272,000 feet of lumber on September 24, 1872 and quickly broke apart. Similarly, the wooden steam barge *B.W. Blanchard* (1870-1904; 9-foot depth) towing the wooden schooner barges *John T. Johnson* (1873-1904; 7-foot depth) and *John Kilderhouse* went aground on North Point during a blinding snowstorm in November 1904. *Blanchard* and *Johnson* were completely wrecked, while *Kilderhouse* was eventually recovered. Though difficult to identify with precision, the scattered remains of several other vessels are located on North Point Reef as well, including the brig *Empire State* (1862-1877), schooner *E. B. Palmer* (1856-1892), and steamer *Congress* (1861-1868), which saw service during the Civil War in Tidewater, Virginia.

Notably, most shipwrecks within the sanctuary occur in shallow and intermediate diving depths and are very popular with SCUBA divers and dive charter business. These include the steamer *Montana* (1872-1914; 60 foot depth), bulk freighter *Grecian* (1891-1906; 100 foot depth), bulk

freighter *Monohansett* (1872-1907; 18-foot depth), steam barge *William P. Thew* (1884-1909; 70-foot depth), steam barge *Oscar T. Flint* (1889-1909; 30-foot depth), schooner *E. B. Allen* (1864-1871; 100 foot depth), and schooner *Lucinda Van Valkenburg* (1862-1887; 60-foot depth).

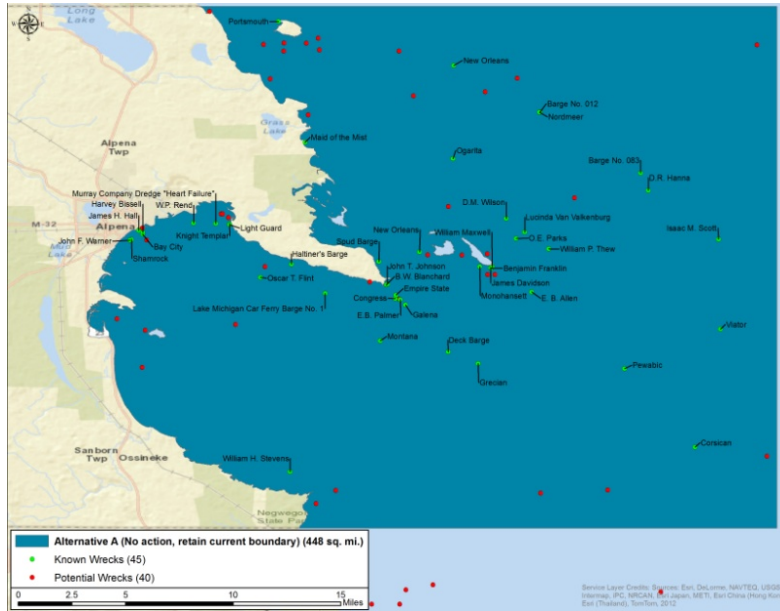


Figure 30: Shipwrecks within Alternative A.

Table 4. List of known historic shipwrecks in Boundary Alternative A.

	Vessel Name	Vessel Type	Hull	Built	Lost	Length	Loss Type	Cargo	County	Depth	Alternative
1	Allen, E.B.	Schooner	Wood	1864	1871	134	Collision	Grain	Alpena	100	A
2	Barge No. 012	Barge	Steel	1897	1975	160	Collision	Supplies	Alpena	40	A
3	Barge No. 083	Barge	Wood	1920	1941	200	Foundered	Well-drilling Machinery	Alpena	70	A
4	Bay City	Schooner Barge	Wood	1857	1902	146	Collision	Light	Alpena	11	A
5	Bissell, Harvey	Schooner	Wood	1866	1905	162	Abandoned	Lumber	Alpena	15	A
6	Blanchard, B.W.	Steam Barge	Wood	1870	1904	221	Stranded	Lumber	Alpena	9	A
7	Congress	Propeller	Wood	1861	1868	139	Stranded, Burned	Salt, Apples, Rail Iron	Alpena	17	A
8	Corsican	Schooner	Wood	1862	1893	112	Collision	Coal	Alpena	160	A
9	Davidson, James	Bulk Freighter	Wood	1874	1883	230	Stranded	Coal	Alpena	38	A
10	Deck Barge	Barge	Steel	Unknown	Unknown	60	Foundered		Alpena	92	A
11	Empire State	Brigantine	Wood	1862	1877	136	Stranded	Iron Ore	Alpena	12	A

	Vessel Name	Vessel Type	Hull	Built	Lost	Length	Loss Type	Cargo	County	Depth	Alternative
12	Flint, Oscar T.	Steam Barge	Wood	1889	1909	218	Burned	Limestone	Alpena	32	A
13	Franklin, Benjamin	Paddle Wheeler	Wood	1842	1850	135	Stranded		Alpena	15	A
14	Galena	Steam Barge	Wood	1857	1872	190	Stranded	Lumber	Alpena	16	A
15	Grecian	Bulk Freighter	Steel	1891	1906	296	Foundered	Light	Alpena	98	A
16	Hall, James H.	Schooner	Wood	1885	1916	91	Stranded	Lumber	Alpena	6	A
17	Haltiner's Barge	Dredge	Wood	Unknwn	1927	80	Foundered	Dredging Equipment	Alpena	17	A
18	Hanna, D.R.	Bulk Freighter	Steel	1906	1919	532	Collision	Wheat	Alpena	130	A
19	Johnson, John T.	Schooner Barge	Wood	1873	1904	171	Stranded	Lumber	Alpena	7	A
20	Knight Templar	Schooner Barge	Wood	1865	1903	136	Abandoned	Light	Alpena	5	A
21	Lake Michigan Car Ferry Barge No. 1	Barge	Wood	1895	1918	309	Foundered	Lumber, Chickens	Alpena	42	A
22	Light Guard	Schooner	Wood	1866	1903	143	Abandoned	Light	Alpena	6	A
23	Maid of the Mist	Schooner	Wood	1863	1878	90	Stranded	Cedar Posts	Alpena	7	A
24	Maxwell, William	Tug	Wood	1883	1908	66	Stranded	Fish	Alpena	12	A
25	Monohansett	Steam Barge	Wood	1872	1907	164	Burned	Coal	Alpena	18	A
26	Montana	Steam Barge	Wood	1872	1914	236	Burned	Light	Alpena	66	A
27	Murray Company Dredge "Heart Failure"	Dredge	Wood		1906		Abandoned	Light	Alpena	18	A
28	New Orleans	Paddle Wheeler	Wood	1838	1849	185	Stranded	Freight	Alpena	13	A
29	New Orleans	Bulk Freighter	Wood	1885	1906	231	Collision	Coal	Alpena	130	A
30	Nordmeer	Ocean Vessel	Steel	1954	1966	470	Stranded	Steel	Alpena	35	A
31	Ogarita	Barkentine	Wood	1864	1905	173	Burned	Coal	Alpena	30	A
32	Palmer, E.B.	Schooner	Wood	1856	1892	138	Stranded	Red Sandstone	Alpena	16	A
33	Parks, O.E.	Steam Barge	Wood	1891	1929	134	Foundered	Pulpwood	Alpena	62	A
34	Pewabic	Propeller	Wood	1863	1865	198	Collision	Copper	Alpena	170	A
35	Portsmouth	Propeller	Wood	1853	1867	182	Stranded	Pig Iron	Alpena	8	A
36	Rend, W.P.	Steam Barge	Wood	1888	1917	287	Stranded	Stone	Alpena	17	A

	Vessel Name	Vessel Type	Hull	Built	Lost	Length	Loss Type	Cargo	County	Depth	Alternative
37	Scott, Isaac M.	Bulk Freighter	Steel	1909	1913	524	Foundered	Coal	Alpena	175	A
38	Shamrock	Steam Barge	Wood	1875	1905	146	Abandoned	Lumber	Alpena	11	A
39	Spud Barge	Barge	Wood	Unknown	1937		Abandoned		Alpena	1	A
40	Stevens, William H.	Schooner	Wood	1855	1863	117	Stranded	Wheat	Alpena	10	A
41	Thew, William P.	Steam Barge	Wood	1884	1909	132	Collision	Light	Alpena	84	A
42	Van Valkenburg, Lucinda	Schooner	Wood	1862	1887	128	Collision	Coal	Alpena	60	A
43	Viator	Ocean Vessel	Steel	1904	1935	231	Collision	Pickled Herring	Alpena	188	A
44	Warner, John F.	Schooner, 2 mast	Wood	1855	1890	126	Abandoned	Lumber, Lath	Alpena	9	A
45	Wilson, D.M.	Bulk Freighter	Wood	1873	1894	179	Foundered	Coal	Alpena	48	A

Tourism

There would be no impact on tourism.

Shipping

There would be no impact on shipping.

Fishing

There would be no impact on commercial and recreational fishing.

Physical and biological environment

There would be no impact on the physical and biological environment.

Boundary Alternative B (808 square miles)

Under Alternative B, an additional 360 square miles would become sanctuary waters and an additional 15 shipwrecks would be in this boundary. This would result in an 808 square mile sanctuary boundary containing a total of 60 known historic shipwrecks (see figure 31).

the limited — though increasing — number of visitors. Given this, the impacts of looting and anchor damage are relatively greater at these sites. Moreover, new shipwreck discoveries at deeper depths continue to occur. Local shipwreck hunters and divers continue to find remarkably well-preserved shipwrecks at these depths, as does the sanctuary and its partners, who discovered five shipwrecks between 2002 and 2011. Negative diver impacts at these sites have potentially greater consequences than at other sites given that they are generally more intact (often with fragile features preserved) and possess a greater number and variety of artifacts.

This alternative is significant chiefly due to a cluster of deeper, well preserved shipwrecks in Presque Isle County, just north of the current sanctuary boundary. Sites here include the schooners *Cornelia B. Windiate* (1874-1875; 180 foot depth), *Defiance* (1848-1854; 185 foot depth) and *Typo* (Figure 32, 1873-1899; 180 foot depth). All are popular technical dive sites and visited regularly by divers.



Figure 32. A photomosaic of the schooner *Defiance*, resting in 185 feet of water outside the sanctuary's northern boundary. Many popular, intact shipwrecks lay in deeper waters outside the current sanctuary boundaries. (NOAA Thunder Bay NMS)

The three-mast wooden schooner *Windiate* sank with all hands in December 1875 while bound from Milwaukee to Buffalo. With no survivors or witnesses, *Windiate's* sinking remains a mystery, although unpredictable November weather was likely a factor. Designed to carry 16,000 bushels of wheat, but reportedly carrying 19,000, she may also have been dangerously overloaded to maximize profits during the last voyage of the season. The *Defiance*, a two-masted schooner built in 1848, is the second earliest known shipwreck in the region. Remarkably well-preserved with tiller steering and cookstove and galley remnants on deck, *Defiance* is a rare example of an early Great Lakes schooner. *Defiance* collided with the brig *Audubon*, in 1854. Finally, the schooner *Typo* sank

during a collision with the steamer *Ketcham*, drowning four crew (Fig 31). Human remains have been reported at the site.



Figure 33. The schooner *Typo*.

The two-masted brigantine *John J. Audubon* (1854-1854; 170-foot depth) is located not far from its collision mate, the two-masted schooner *Defiance* mentioned above. Their 1854 collision illustrates the hazards of Great Lakes shipping as it emerged in the mid-19th century. The 1854 shipping season was the most costly to date, with losses totaling 119 lives, 70 ships and \$2 million in property. *Defiance* (Figure 31) and *John J. Audubon* were among the victims of that dangerous year.



Figure 34. The 300-foot long steamer *Norman*, resting in 200 feet of water outside the sanctuary's northern boundary. Listing to port but intact, the enormous steel wreck contains many artifacts as well as human remains.

Two well-preserved but historically different steamers are off the Presque Isle area as well. Like nearly all of the wrecks in this offshore area, they were victims of collisions in the busy shipping lanes where upbound and downbound routes nearly converged. The wooden steamer *Florida* (1889-1897; 200 foot depth) today sits upright on the lake bottom and contains a large amount of cargo, including wheat, flour, syrup, and whiskey. The 300 foot long steel freighter *Norman* (1890-1895; 200 foot depth), is close by (Figure 34). The vessel was of many owned or leased by the U.S. Steel Corporation and helped fuel the fortune of J P Morgan.

Shallower sites close to the Presque Isle shoreline and accessible by beginning divers, snorkelers and kayakers, include the schooner *Portland* (1863-1877; 6 foot depth) and early sidewheel steamer *Albany* (1846-1853; 4 foot depth).

To the south, many of the known shipwrecks in Alcona County are found in shallow water. Included in this group are the *Marine City* (1866-1880; 5 foot depth) and *City of Alpena* (1874-1880; 9 foot depth). Twenty lives were lost when the wooden side-wheel steamboat *Marine City* burned off Alcona in 1880. The same year, the wooden harbor tug *City of Alpena* burned off Black River. Other shallow water wrecks located off Alcona County include the schooner *Buckingham* (1853-1870; 9 foot depth), schooner *Ishpeming* (1872-1903; 12 foot depth), and steam barge *Loretta* (1892-1896; 7 foot depth).

The 808-square-mile area was evaluated because it was NOAA’s preferred boundary during the sanctuary’s original designation process. However, limiting the sanctuary to the 808-square-mile area excluded 32 significant shipwrecks (more have been discovered since) in the region and reduces the likelihood of inclusion of undiscovered shipwrecks. In 2009, during management plan review, a Sanctuary Advisory Council working group rejected this alternative in favor of a larger one because this alternative limited inclusion of known and undiscovered shipwrecks in the sanctuary. Public scoping meetings in 2012, and letters of support from local governments and NGOs indicated strong public support for a boundary larger than 808 square miles.

Table 5 lists the 15 additional historic shipwrecks in Boundary Alternative B that are not already identified in Alternative A.

Table 5. List of additional known historic shipwrecks in Boundary Alternative B.

	Vessel Name	Vessel Type	Hull	Built	Lost	Length	Loss Type	Cargo	County	Depth	Alternative
1	Albany	Paddle Wheeler	Wood	1846	1853	202	Stranded	Provisions	Presque Isle	5	B

	Vessel Name	Vessel Type	Hull	Built	Lost	Length	Loss Type	Cargo	County	Depth	Alternative
2	Audubon, John J.	Schooner	Wood	1854	1854	148	Collision	Rail Iron	Presque Isle	170	B
3	Black River Wreck	Schooner	Wood	?	?	?	?	?	Alcona	6	B
4	Buckingham, Alvin	Schooner	Wood	1853	1870	124	Stranded	Iron Ore	Alcona	8	B
5	City of Alpena	Tug	Wood	1874	1880	72	Burned	Light	Alcona	9	B
6	Corsair	Schooner	Wood	1866	1872	133	Foundered	Iron Ore	Alcona	170	B
7	Defiance	Schooner	Wood	1848	1854	115	Collision	Corn, Wheat	Presque Isle	185	B
8	Dump Scow	Barge	Wood	Unkn own	1930		Foundered		Presque Isle	130	B
9	Florida	Package Freighter	Wood	1889	1897	270	Collision	Package Freight	Presque Isle	206	B
10	Ishpeming	Schooner Barge	Wood	1872	1903	157	Stranded	Coal	Alcona	12	B
11	Loretta	Steam Barge	Wood	1892	1896	140	Burned	Chain	Alcona	7	B
12	Norman	Bulk Freighter	Steel	1890	1895	296	Collision	Light	Presque Isle	200	B
13	Portland	Schooner	Wood	1863	1877	150	Stranded	Salt	Presque Isle	6	B
14	Typo	Schooner	Wood	1873	1899	137	Collision	Coal	Presque Isle	155	B
15	Windiate, Cornelia B.	Schooner	Wood	1874	1875	136	Foundered	Grain	Presque Isle	190	B

Additional Maritime Heritage Sites and the Cultural Landscape

The consequences under Alternative B are similar to Alternative A, but Rogers City would not be in the boundary. However, the lighthouses at Presque Isle would be included.

Tourism

There would be no negative consequences for tourism. Anticipated positive consequences are summarized in the *Consequences Common to all Boundary Alternatives* section.

Shipping

There would be no impact on shipping.

Fishing

There would be no impact on commercial and recreational fishing.

Maritime heritage resources

This boundary alternative would include all of the shipwrecks described in alternatives A and B, most notably a cluster of deep, well preserved shipwrecks off of Presque Isle, MI (described above). Alternative C would also include several additional significant shipwrecks, most notably a cluster of wrecks around Spectacle Reef.

Spectacle Reef and nearby Raynold's Reef are a pair of shoals in Lake Huron about ten miles offshore from Nine Mile Point. Over the years scores of vessels stranded on these shallow water reefs. In 1871, construction began on an 86-foot tall lighthouse on Spectacle Reef which was completed in 1874 and still stands today. In September 1869, just prior to construction, the *Nightingale* (1856-1869; 70 foot depth) stranded on the reef. Bound from Milwaukee to Oswego with 15,000 bushels of wheat, the schooner *Kate Hayes* (1856-1856) stranded on Spectacle Reef on a clear calm night in 1856. Nearby are the schooners *Newell Eddy* (1890-1893; 130 foot depth) and *Augustus Handy* (1855-1861). The 242-foot three-masted schooner barge, *Newell A. Eddy*, built at West Bay City, Michigan, in 1890, foundered in a storm with a cargo of grain and all nine hands in 1893. Resting in 160 feet of water, the well preserved site is a popular dive attraction. In 1855 the *Augustus Handy* was struck by lightning, disabled and sunk.

Ten miles north of Presque Isle are the schooner *M. F. Merrick* (Figure 36, 1863-1889; 300 foot depth) and steamer *Etruria* (1902-1905; 300 foot depth), a pair of shipwrecks discovered by the sanctuary in 2011. Both are in 300 feet of water and coordinates have not yet been released to the public. Notably, both shipwrecks were discovered during the Sony and Intel sponsored *Project Shiphunt*, which brought five Saginaw, Mich. high school students to the sanctuary to locate and document an historic shipwreck. The student team worked closely with NOAA and Woods Hole Oceanographic Institution researchers to find the two shipwrecks. A one hour documentary was produced, as well as a curriculum aligned with The Science, Technology, Engineering, and Mathematics (STEM) Education Coalition objectives. The project is an excellent example of the opportunities that the sanctuary can help leverage, to both support its research efforts and make possible unique learning experiences for a wide range of students.



Figure 36. These excellent photos of the *M. F. Merrick* taken in 2011 by volunteers significantly enhanced the sanctuary's assessment of this newly discovered shipwreck. The image of the vessel's stern at left gives a good indication of site integrity and reveals some distinctive architectural elements, as well as coverage of invasive quagga mussels. To the right, the vessel's cargo hold, revealing substantial artifacts- several wheelbarrows used by the crew to handle the *Merrick's* bulk cargo. Note the presence of mussels, even inside the vessel. John Janzen.

Four miles off Presque Isle is the schooner *Kyle Spangler* (1856-1860; 185 foot depth), sunk in an 1860 collision (Figure 37). The schooner *Kyle Spangler* was built by William Augustus Jones (1808-1888), son of Augustus Jones (1782-1841), the patriarch of an important but modestly researched family of shipbuilders. The Joneses collective output of Great Lakes vessels numbers in the hundreds and occurred at a seminal period in Great Lakes shipbuilding (see historical information section). Built to maximize cargo space and barely squeeze through the locks of the Welland canal, the "canaller" *Kyle Spangler* is a unique and well preserved archeological site; a tangible link to William Jones and to a distinctive type of Great Lakes craft.

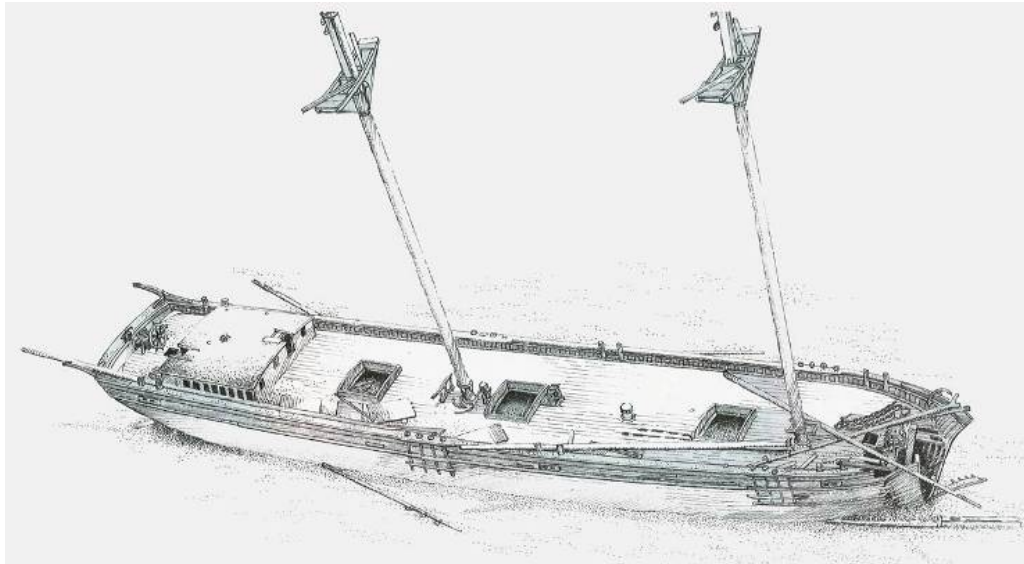


Figure 37. A perspective view of the wooden schooner *Kyle Spangler*, resting in 185 feet of water in the preferred boundary area. Largely intact, except for collision damage at the bow, the site represents the high degree of preservation of many shipwrecks in this depth range. In 2008, sanctuary archaeologists worked with the wreck's founder, Michigan diver Stan Stock, to document the site. (NOAA Thunder Bay NMS)

In shallower water near Presque Isle are the schooner *American Union* (1862-1894; 8 foot depth) and an unidentified schooner at North Bay (Figure 38). Other shallow shipwrecks in this boundary

alternative include several off Rogers City, including the steamer *Joseph Fay* (1871-1905; 17 foot depth), tugs *Mason* (1898-1924; 13 foot depth) and *Duncan City* (1863-1923; 15 foot depth), and schooner *Chester Jones* (1873-1924; 16 foot depth). Notably, a large section of the starboard side of the *Fay* is located on the beach near 40 Mile Point Lighthouse in Presque Isle County. Closer to Cheboygan, off Cordwood Point, is the steamer *Anna Smith* (1873-1889).



Figure 38. A snorkeler explores the shallow wreck of the schooner *American Union* (NOAA TBNMS).

Approximately 20 miles east of Alpena is the steamer *Monrovia* (1943-1959; 130 foot depth), a popular dive site in 130 feet of water. In this alternative's southern waters are the newly discovered steamer *Egyptian* (1873-1897; 230 foot depth), located in 230 feet of water. In similar water depths are the *W.C. Franz* (1901-1934; 230 foot depth) and *W.H. Gilbert* (1892-1914; 255 foot depth). In 130 feet of Harrisville is the schooner *John Shaw* (1885-1894; 130 foot depth).

Notably, this alternative also contains an area that may possess prehistoric archeological sites. Recent research by the University of Michigan is attempting to discern the archaeological potential of the Alpena-Amberley Ridge, a now submerged land bridge that once connected Michigan with Canada (Figure 39). Roughly 9,900 – 7,500 years ago the ridge formed a dry land corridor extending across Lake Huron from Presque Isle in northeast Michigan to the Point Clark area in southern Ontario. This land bridge would have provided a natural causeway for the migration of caribou and valuable terrain for hunters seeking to exploit the herd.

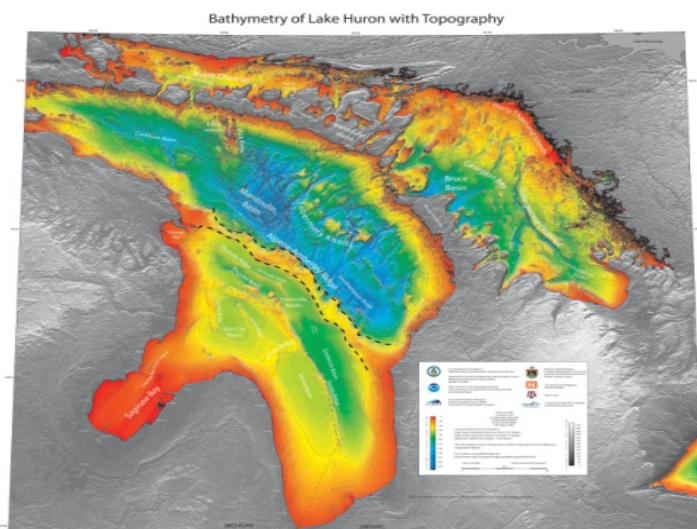


Figure 39. A bathymetry map of Lake Huron showing the Alpena-Amberley Ridge, which once connected Michigan with Canada. University of Michigan anthropologists are searching the area for prehistoric archaeological sites. (NOAA GLERL)

The archaeological integrity of individual resources within the current sanctuary and Preferred Alternative is strengthened tremendously by the fact that, collectively, Thunder Bay’s shipwrecks present a microcosm of Great Lakes commercial shipping and culture. The area’s shipwrecks reflect transitions in ship architecture and construction methods, from wooden sailboats to steel-hulled vessels, and represent virtually all types of vessels used on the open Great Lakes. These vessels were engaged in nearly every type of trade, thereby linking Thunder Bay inextricably to Great Lakes commerce. Encompassing an extensive array of historical themes, backed by an impressive archaeological record, Table 6 lists the 32 shipwrecks in Boundary Alternative C that are not in Alternatives A and B.

Table 6. List of additional known historic shipwrecks in Boundary Alternative C.

	Vessel Name	Vessel Type	Hull	Built	Lost	Length	Loss Type	Cargo	County	Depth	Alternative
1	American Union	Schooner	Wood	1862	1894	185	Stranded	Light	Presque Isle	8	C
2	Barney, D.N.	Schooner	Wood	1845	1849	110	Stranded		Presque Isle	5	C
3	Barney, F.T.	Schooner	Wood	1856	1868	126	Collision		Presque Isle	160	C
4	Bentley, James R.	schooner	Wood	1867	1878	178	Foundered	Rye	Presque Isle	165	C
5	Detroit	Paddle Wheeler	Wood	1859	1872	240	Stranded		Alcona	15	C
6	Duncan City	Tug	Wood	1883	1923	104	Abandoned	Light	Presque Isle	15	C
7	Eddy, Newell A.	Schooner	Wood	1890	1893	242	Foundered	Wheat	Mackinaw	168	C
8	Egyptian	Bulk Freighter	Wood	1873	1897	232	Burned	Coal	Alcona	260	C
9	Etruria	Bulk Freighter	Steel	1902	1905	414	Collision	Coal	Presque Isle	310	C*
10	Fay, Joseph S.	Bulk Freighter	Wood	1871	1905	215	Stranded	Iron Ore	Presque Isle	17	C
11	Franz, W.C.	Bulk Freighter	Steel	1901	1934	346	Collision	Light	Alcona	230	C
12	Gilbert, W.H.	Bulk Freighter	Steel	1892	1914	328	Collision		Alcona	255	C
13	Greenbush Wreck	?	Wood						Alcona	10	C
14	Handy, Augustus	Schooner	Wood	1855	1861	126	Stranded	Wheat	Mackinaw		C
15	Hayes, Kate	Schooner	Wood	1856	1856	130	Stranded	Wheat	Mackinaw		C
16	Jewett, John	Schooner	Wood	1866	1898	91	Stranded		Presque Isle	10	C

	Vessel Name	Vessel Type	Hull	Built	Lost	Length	Loss Type	Cargo	County	Depth	Alternative
17	Johnson, Henry J.	Bulk Freighter	Wood	1888	1902	260	Collision	Iron Ore	Presque Isle	160	C
18	Jones, Chester B.	Schooner	Wood	1873	1924	167	Abandoned	Light	Presque Isle	16	C
19	Marine City	Paddle Wheeler	Wood	1866	1880	192	Burned	Shingles, Fish	Alcona	5	C
20	Mason, W.G.	Tug	Wood	1898	1924	84	Abandoned	Light	Presque Isle	13	C
21	Merrick, M.F.	Schooner	Wood	1863	1889	137	Collision	Furnace Sand	Presque Isle	300	C
22	Messenger	Steam Barge	Wood	1866	1890	136	Burned	Cedar	Presque Isle	194	C
23	Monrovia	Ocean Vessel	Steel	1943	1959	447	Collision	Steel	Alpena	140	C
24	New York	Package Freighter	Wood	1879	1910	268	Foundered	Freight	Alcona	90	C
25	Nightingale	Schooner	Wood	1856	1869	138	Stranded	Iron Ore	Mackinaw	70	C
26	North Bay Wreck	Schooner	Wood						Presque Isle		C
27	Northern Light	Barge	Wood	1858	1880	210	Stranded		Alcona	2	C
28	Northwestern	Brig	Wood	1847	1850	110	Collision	Salt	Presque Isle	135	C
29	Persian	schooner	Wood	1855	1868	115	Collision	Wheat	Presque Isle	172	C
30	Shaw, John L.	Schooner	Wood	1885	1894	205	Foundered	Coal	Alcona	128	C
31	Smith, Anna	Bulk Freighter	Wood	1873	1889	178	Stranded		Cheboygan		C
32	Spangler, Kyle	Brig	Wood	1856	1860	130	Foundered	Corn	Presque Isle	185	C

Additional Maritime Heritage Sites and the Cultural Landscape

The consequences under Alternative C are similar to Alternative B, but would include Rogers City, the 40 Mile Point Lighthouse, the Presque Isle County Historical Museum, the Great Lakes Lore Maritime Museum, and Spectacle Reef Light.

Tourism

There would be no negative consequences for tourism. Anticipated positive consequences are summarized in the *Consequences Common to all Boundary Alternatives* section.

Shipping

As indicated in Sections III and IV, NOAA chose not to include the ports of Rogers City and Presque Isle in the sanctuary boundary and to remove the port of Alpena from the sanctuary boundary for

the preferred alternative. This was due to comments submitted by the Governor of Michigan, the Lake Carriers' Association, the Canadian Shipowners Association, the Shipping Federation of Canada, local government officials, other commercial interests, and members of the general public requesting that these ports not be included within the boundary in order to avoid any limitation or prohibition on port operations "critical to the local, regional, and national economies." Specifically, these commenters indicated that expansion would restrict or prohibit ballasting operations for vessels transiting the sanctuary, given USCG and EPA requirements that require certain vessels equipped with ballast tanks to "avoid the discharge and uptake of ballast water in areas within, or that may directly affect marine sanctuaries, marine preserves, marine parks, or coral reefs."

Based on information in the written comments, other literature on Great Lakes ballasting, and input from USCG and EPA on their respective requirements (which continues in effect) NOAA believes ballasting operations, to include safety and to control or maintain trim, draught or stability of the vessel, are consistent with the maritime heritage protection mission of the TBNMS, and therefore, are an allowable activity within the proposed boundaries of the sanctuary.

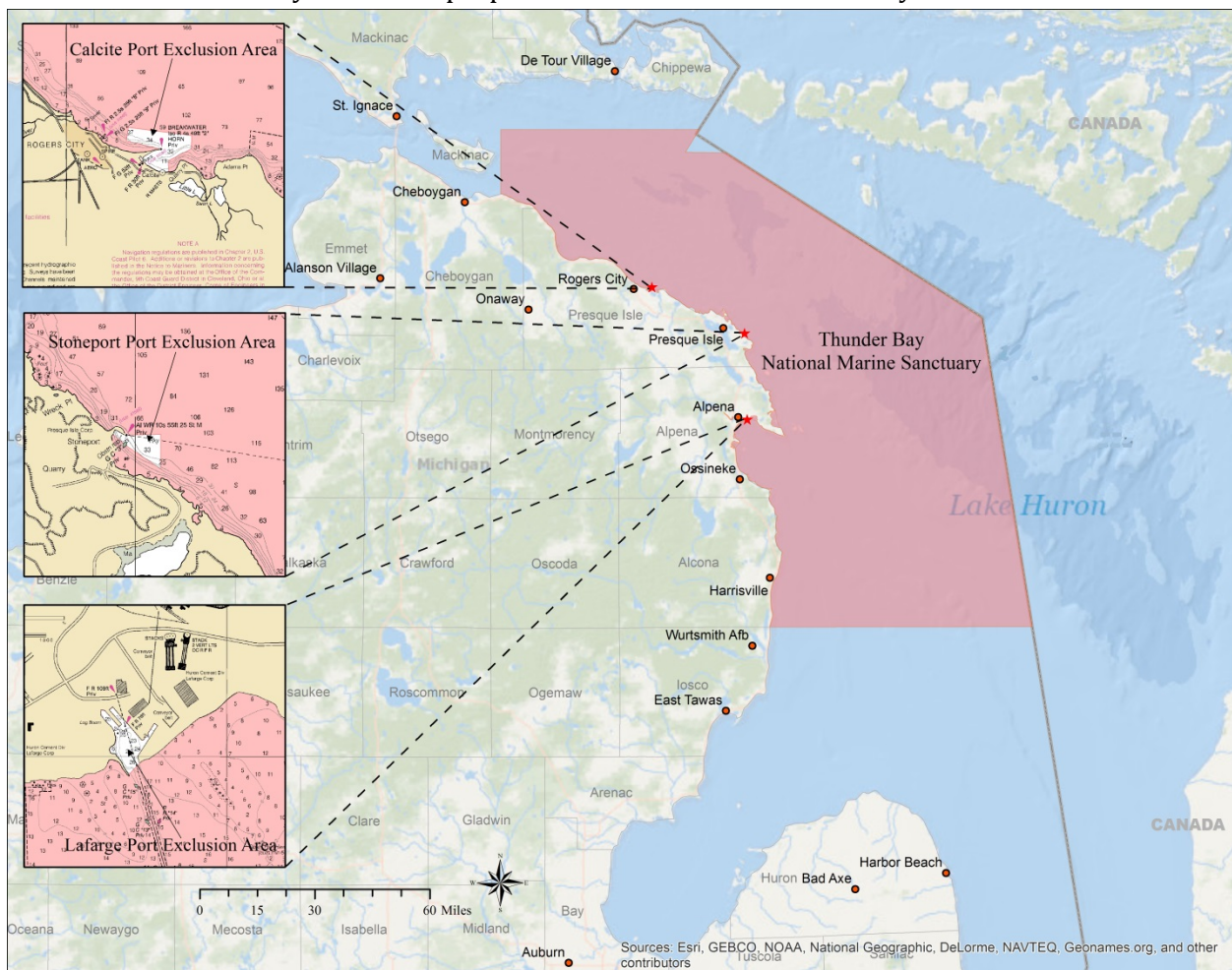


Figure 40. Map of NOAA's Preferred Alternative boundary. The commercial ports at Alpena, Presque Isle and Rogers City are not included in the expanded sanctuary boundary.

Fishing

There would be no impact on commercial and recreational fishing. Based on government to government consultation with federally recognized Indian Tribes that fish in the current and expanded sanctuary, NOAA's Preferred Alternative also clarifies and updates TBNMS regulations pertaining to treaty fishing rights of area Indian tribes. Specifically, NOAA would amend the TBNMS regulations in order to clarify that the exercise of Indian treaty fishing rights are not modified, altered, or in any way affected by the proposed boundary expansion. In particular, NOAA plans to add and define the term "treaty fishing rights" to the TBNMS definitions at 15 CFR 922.191. The definition was specifically suggested during tribal consultations undertaken pursuant to E.O. 13175 with the Chippewa Ottawa Resource Authority (CORA) which represents all 1836 treaty fishing tribes and contained in several written public comments received from a federally-recognized Indian tribe and an interested tribal resource agency. The purpose of the definition is to clarify that the term "treaty fishing rights" refers to those rights reserved in the 1836 Treaty of Washington and in subsequent related court decisions because the tribes believe the existing TBNMS regulations are ambiguous. This definition would not replace, but would rather complement, the existing definition of "traditional fishing" which also refers to the 1836 Treaty of Washington currently codified in 15 CFR 922.191.

Physical and biological environment

A minor increase in charter boats catering to tourist activities may occur as a result of boundary expansion. Given that sewage discharges from vessels are not permitted in the Great Lakes and that a handful of additional charter boats is a negligible increase when compared to the numerous recreational fishing boats, NOAA does not expect any negative impacts on the physical or biological environment as a result of increased tourism. In addition, since the designation of the sanctuary in 2000, the main increase in tourism has been seen on land rather than in the sanctuary. Anticipated positive consequences are summarized in the *Consequences Common to all Boundary Alternatives* section. Ultimately, NOAA's action allows the commercial shipping status quo to continue, so no negative physical or biological impact is anticipated.

Cumulative Impacts

Activities to manage the sanctuary as proposed in the boundary expansion analysis generally result in beneficial effects to the maritime heritage resources and cultural landscape environment. No adverse effects of the action have been identified. However, the positive effects would provide for incremental additional resource protection to known and suspected shipwrecks. The past, present, and reasonably foreseeable actions that were considered in conjunction with the proposed sanctuary expansion include:

- State laws relating to maritime heritage resources (Part 761 of the Natural Resources and Environmental Protection Act, 1994 PA 451, MCL 324.76101 *et seq*). These laws impact maritime heritage resources by prohibiting resource disturbance or artifact recovery

without a permit. The cumulative effects of these laws, when considered with the proposed action, are to protect maritime heritage resources from disturbance and destruction. Public awareness about state laws related to maritime heritage resources is also expected to increase as a result of the proposed action, further reinforcing this effect.

- The Lake Huron Binational Partnership effort focuses on pollution reduction activities in areas of obvious importance, such as Areas of Concern (AOCs), and directly pursues on-the-ground activities to protect areas of high-quality habitat within the Lake Huron basin. Existing stakeholder and agency forums are used as much as possible to support the goals of the Partnership. The Partnership maintains a close association with the Remedial Action Plan efforts in AOCs, the Great Lakes Fishery Commission's Lake Huron and Lake Huron Technical Committees, the State of the Lakes Ecosystem Conference (SOLEC), and domestic efforts that support the Partnership. The Thunder Bay Final Management Plan of 2009, which would apply to the larger area considered for expansion, contains an activity to partner with multidisciplinary researchers to study Lake Huron. This proposed action, if implemented, may benefit this project in a small way by extending the area over which the state and federal agencies and sanctuary staff may partner. The proposed action would not have significant impacts on the natural environment of Lake Huron being protected and restored.

Beneficial effects considered together with the many natural and human-induced stressors may somewhat lower the beneficial effects of implementing the proposed action. Such stressors include human threats and natural processes. Human threats include looting sanctuary shipwreck sites, disturbing artifacts or the wreck itself, and damaging sites by anchoring. The expansion of sanctuary boundaries to include an additional 47 known historic shipwrecks would have a non-significant, but beneficial, impact on the resources by reducing the occurrence of these human threats. Natural processes include the impacts of wind, waves, storms and ice, as well as the impact of invasive species such as zebra and quagga mussels that today cover most of Lake Huron's shipwrecks. The outcome of these external stressors is not expected to be altered by the implementation of the proposed action. This is because, no single activity, when taken in consideration with others, would have significant beneficial or negative impacts on any individual or combined resource. Therefore, cumulative impacts of this action are not considered significant under NEPA. Based on this analysis, the proposed expansion of TBNMS, reviewed in conjunction with other actions taking place in the Thunder Bay region, is not expected to result in significant cumulative impacts on sanctuary resources or the environment.

VI. Appendices

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F. Findings and Determinations

Under the NMSA the Secretary of Commerce may designate an area as a national marine sanctuary and promulgate regulations implementing the designation if the Secretary makes a set of determinations and findings and has considered factors and conducted consultations described in the NMSA (16 U.S.C. 1433(a) and (b)). Although TBNMS was designated in 2000, the NMSA states that terms of designation may be modified only by the same procedures by which the original designation was made. Because this action includes revisions to the TBNMS terms of designation (see summary below), relevant determinations and findings based on required factors and consultations are described here. In addition, NEPA requires that the ONMS explain how the action and regulations described in this document relate to existing law and executive orders. This Appendix meets these NMSA and NEPA requirements by describing the consultations, determinations and findings, and discussing the relation of the action to existing laws and executive orders.

Summary of Changes to TBNMS Terms of Designation

Section 304(a)(4) of the NMSA requires that the terms of designation for national marine sanctuaries include: (1) The geographic area included within the Sanctuary; (2) the characteristics of the area that give it conservation, recreational, ecological, historical, research, educational, or esthetic value; and (3) the types of activities subject to regulation by NOAA to protect those characteristics. This section also specifies that the terms of the designation may be modified only by the same procedures by which the original designation is made.

With this action, NOAA is changing the terms of designation by altering the description of:

- The boundary of the sanctuary (Article II);
- The characteristics of the sanctuary (Article III); and
- The new organizational structure of the ONMS within NOAA (Article IV).

Consultations under the NMSA and other statutes

Under section 303(b)(2) of the NMSA, the ONMS is required to conduct a series of consultations with Congress, federal and state agencies, and other interested parties. Per this requirement, consultation letters were sent in June 2013 to the following upon publication of the proposed rule (78 FR 35776).

- House of Representatives Resources Committee;
- Senate Committee on Commerce, Science, and Transportation;
- Department of Defense;
- Department of State;
- Department of Transportation;
- Department of the Interior;
- U.S. Army Corps of Engineers (Detroit District);
- Environmental Protection Agency (Region 5);
- U.S. Fish & Wildlife Service (Regional Office); and
- U.S. Coast Guard (9th District).

Consultation letters were sent to the following again upon publication of the amended proposed rule (79 FR 26654):

- House of Representatives Resources Committee;
- Senate Committee on Commerce, Science, and Transportation;
- Department of Defense;
- Department of State;
- Department of Transportation; and
- Department of the Interior.

The NMSA and other laws require an additional set of consultations after the DEIS is released for public review. These additional consultations initiated in June 2013 include:

- Federal consistency consultation (determination) with State of Michigan Coastal Management Program (required by the Coastal Zone Management Act); and
- National Historic Preservation Act Section 106 consultation with Michigan State Historic Preservation Officer.

Lastly, government-to-government consultation with Federally-recognized Indian tribes under Executive Order 13175 took place throughout the duration of this process.

The comments and ideas received in response to the consultation letters were considered in the preparation of this final EIS. The result of these consultations was also used to assist in making the findings and determinations described below. Responses that were received are included at the end of this Appendix.

NMSA and NEPA Findings and Determinations

A. Determinations Required Under Section 303(a) of the NMSA

1. The designation will fulfill the purposes and policies of the NMSA.

These determinations and findings were made when TBNMS was designated in 2000 and are described in the sanctuary's designation documentation found in the Federal Register (65 FR 39042). The changes to the terms of designation described in the summary above are consistent with and further support the original determinations and findings.

2. The area is of special national significance due to—

- A. its conservation, recreational, ecological, historical, scientific, cultural, archaeological, educational, or esthetic qualities;***
- B. the communities of living marine resources it harbors; or***
- C. its resource or human-use values.***

The shipwrecks and maritime heritage resources of the sanctuary possess exceptional value in all categories (conservation, recreational, historical, scientific, cultural,

archaeological, educational, and esthetic qualities) except ecology. The changes will provide protection to additional shipwrecks and maritime heritage resources within TBNMS as a result of a deeper understanding of the maritime heritage of the Great Lakes. The collection of 92 known shipwrecks located within the expanded boundary of the Thunder Bay National Marine Sanctuary and Underwater Preserve represents a large diversity of vessels that navigated the Great Lakes in the 19th and 20th centuries.

3. Existing State and Federal authorities are inadequate or should be supplemented to ensure coordinated and comprehensive conservation and management of the area, including resource protection, scientific research, and public education.

In order to ensure long-term protection of nationally significant historical resources, fill important gaps in archeological knowledge and historical context, and enhance sustainable recreational and tourism opportunities within the greater Thunder Bay region, the shipwrecks in the expansion area require the same comprehensive and coordinated management (including extensive research, education, and public outreach programs) NOAA provides to sites within the existing TBNMS boundary.

While state laws and other applicable federal law (such as The Abandoned Shipwreck Act codified in 43 USC 2101, et seq.) intended to reduce the impact of human activities on historic shipwrecks and related maritime heritage resources have been effective, those laws only apply to abandoned property. Abandoned property is defined under the Abandoned Shipwrecks Act of 1987 (43 U.S.C. 2101–2106), and there are some historical shipwrecks and artifacts that are significant but are not included in that definition. Sanctuary regulations in the expanded area apply to all historic shipwrecks, some of which may not be considered “abandoned”, and, therefore, provide the following conservation benefits: (1) The use of grappling hooks or other anchoring devices is prohibited on underwater cultural resource sites that are marked with a mooring buoy; (2) “Hand-taking” of artifacts is prohibited even if they are located away from the original shipwreck; (3) Permit applications are required to satisfy the Federal Archaeology Program guidelines for all sites located within the revised sanctuary boundary, which prevent inadvertent damage to shipwrecks; and (4) NOAA may assess civil penalties under the NMSA for violation of sanctuary regulations, which provides a strong deterrent to violations.

4. Designation of the area as a national marine sanctuary will facilitate the objectives stated in paragraph 3.

The original FEIS (2000) found that existing statutes did not provide a comprehensive management mechanism for TBNMS. The changes to the boundary of the sanctuary in the terms of designation will allow designation of 47 additional known historic shipwrecks of special national significance, and other maritime heritage resources (i.e., docks, cribs), located outside the sanctuary’s original boundary. The changes will also allow for a more comprehensive and coordinated management, enhancing scientific research and public education, of the maritime heritage resources in TBNMS.

5. The area is of size and nature that will permit the comprehensive and coordinated conservation and management.

Within its current budget, and with supplemental funds from grants and partners, NOAA is capable to conduct significant on-water research and outreach outside the current boundaries. More information on TBNMS programs and enforcement can be found in the 2008 final management plan, which is available at www.thunderbay.noaa.gov, and in the 2013 Thunder Bay Condition Report found at <http://sanctuaries.noaa.gov/science/condition/tbnms/>.

B. Section 303(b)(1) of the NMSA (16 U.S.C. 1433(b)(1)) requires that the following factors be considered for purposes of determining if an area of the marine environment meets the standards set forth in section 303(a). Each factor is discussed below:

1. The area's natural resource and ecological qualities, including its contribution to biological productivity, maintenance of ecosystem structure, maintenance of ecologically or commercially important or threatened species or species assemblages, maintenance of critical habitat or endangered species, and the biogeographic representation of the site.

N/A

2. The area's historical, cultural, archaeological, or paleontological significance.

The exceptional cultural and historical qualities of TBNMS are described in the original FEIS (2000) on pages 109-167. An updated description of the qualities of the entire expanded sanctuary is provided in the Affected Environment section of this document. Expanding TBNMS emphasizes recognition of the national significance of the cultural and historical resources within the sanctuary.

3. The present and potential uses of the area that depend on maintenance of the area's resources, including commercial and recreational fishing, subsistence uses, other commercial and recreational activities, and research and education.

N/A

4. The present and potential activities that may adversely affect the factors identified in subparagraphs 1, 2, and 3.

A description of the human uses of the sanctuary and its surrounding areas is provided in the original FEIS (2000) on pages 213-233. An updated description is provided in the Affected Environment section of this document. The changes to the boundary of the sanctuary in the terms of designation will allow designation of 47 additional known historic shipwrecks of special national significance, and other maritime heritage resources (i.e., docks, cribs), located outside the sanctuary's original boundary. The changes will also allow for a more comprehensive and coordinated management, enhancing scientific research and public education, of the maritime heritage resources in TBNMS.

5. The existing State and Federal regulatory and management authorities applicable to the area and the adequacy of those authorities to fulfill the purposes of the NMSA.

The management authorities applicable to the sanctuary are described in the original FEIS (2000) in Appendices A-F. An updated description is provided in the Affected Environment section of this document. Existing management authorities were considered in the Final Rule designating the Sanctuary in 2000 (65 FR 39041) and the additional protections and

comprehensive management approach provided by the original and revised sanctuary management plan and regulations continue to apply.

6. The manageability of the area, including such factors as its size, its ability to be identified as a discrete ecological unit with definable boundaries, its accessibility, and its suitability for monitoring and enforcement activities.

Within its current budget, and with supplemental funds from grants and partners, NOAA is capable to conduct significant on-water research and outreach outside the current boundaries. More information on TBNMS programs and enforcement can be found in the 2008 final management plan, which is available at www.thunderbay.noaa.gov, and in the 2013 Thunder Bay Condition Report found at <http://sanctuaries.noaa.gov/science/condition/tbnms/>.

7. The public benefits to be derived from sanctuary status, with emphasis on the benefits of long-term protection of nationally significant resources, vital habitats, and resources which generate tourism.

The public benefits from sanctuary status were described in the original FEIS (2000) and final rule designating the Sanctuary and reaffirmed in this FEIS and final rule. The changes to the boundary of the sanctuary in the terms of designation described in this document will enhance public benefits by protecting of 47 additional known historic shipwrecks of special national significance, and other maritime heritage resources (i.e., docks, cribs), located outside the sanctuary's original boundary. The changes will also allow for a more comprehensive and coordinated management, enhancing scientific research and public education, of the maritime heritage resources in TBNMS.

8. The negative impacts produced by management restrictions on income-generating activities such as living and nonliving resources development.

N/A

9. The socioeconomic effects of sanctuary designation.

An analysis of the socioeconomic impacts of the changes to the terms of designation by this FEIS is included in the Environmental Consequences Section. The impacts are also analyzed in the Final Regulatory Flexibility Analysis section of the final rule. The socioeconomic analysis concludes that impacts of the changes will be minimal.

10. The area's scientific value and value for monitoring the resources and natural processes that occur there.

The area's scientific value and value for monitoring the resources and natural processes are described in the original FEIS (2000) and reaffirmed in the Environmental Consequences section of this document.

11. The feasibility, where appropriate, of employing innovative management approaches to protect sanctuary resources or to manage compatible uses.

The changes to the boundary of the sanctuary and to the terms of designation represent an appropriate mechanism to manage and protect sanctuary resources by increasing the area,

and therefore the number of shipwrecks and maritime heritage resources, protected by the sanctuary.

12. The value of the area as an addition to the System.

The purpose of this proposed action is to provide long-term protection and comprehensive management for 47 additional known historic shipwrecks of special national significance, and other maritime heritage resources (i.e. docks, cribs), located in Lake Huron outside the sanctuary's original boundary. The action also provides authority for the protection of additional historic shipwrecks and maritime heritage resources known to be in the area, but yet to be discovered. Although the sheer number of shipwrecks within the sanctuary is impressive, it is the range of vessel types and their excellent state of preservation and accessibility to the public that makes the collection nationally significant.

C. Resource Assessment

1. Present and potential uses of the area, including commercial and recreational fishing, research and education, minerals and energy development, subsistence uses, and other commercial, governmental, or recreational uses.

A full description of the current and potential uses of the area can be found in the Affected Environment section of this FEIS.

2. Any commercial, governmental, or recreational resource uses in the areas that are subject to the primary jurisdiction of the Department of the Interior.

The Department of the Interior has been contacted and has communicated no concern regarding this action.

3. Information prepared in consultation with the Secretary of Defense, the Secretary of Energy, and the Administrator of the Environmental Protection Agency, on any past, present, or proposed future disposal or discharge of materials in the vicinity of the proposed sanctuary
As noted above, the Secretary of Defense and the Environmental Protection Agency have been consulted. NOAA is not aware of any disposal or discharge areas designated by these agencies that are within the vicinity of the sanctuary.

Relation to Existing Laws and Executive Orders

NEPA requires that a discussion of the relation of the action to other existing laws and executive orders be included. The relation of this action to other legal requirements is discussed as follows:

Coastal Zone Management Act (CZMA)

The CZMA creates a partnership between the Federal and State governments that allows States to develop coastal zone management programs within a set of Federal guidelines but tailored to their individual needs. The act also requires that each Federal agency activity within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone shall be carried out in a manner that is, to the maximum extent practicable, consistent with the enforceable policies of the Federally-approved state coastal zone management program.

NOAA has worked with the State of Michigan in the planning efforts leading to the publication of the proposal for this action. It determined that the proposed action was consistent with the enforceable policies of the coastal management program and consulted with the State of Michigan on the federal consistency of this action with the Michigan Coastal Zone Management Program. The Michigan Department of Environmental Quality, which oversees the Coastal Zone Management Program, did not have any objections to the proposal.

Magnuson-Steven Fishery Conservation and Management Act (MSFCMA)

The MSFCMA governs the management and conservation of fisheries in Federal waters of the United States and created the South Atlantic Fishery Management Council (SAFMC), along with seven other regional councils. This act requires Federal agencies to consult with NOAA Fisheries Service regarding any agency action they authorize (e.g., issue permits for), fund, or undertake, that may adversely affect essential fish habitat (EFH) or Highly Migratory Species (HMS). Because NOAA's action pertains to the conservation of shipwrecks and maritime heritage resources and there is no effect on EFH, NOAA did not consult with the relevant agencies under the MSFCMA.

National Historic Preservation Act (NHPA)

The National Historic Preservation Act of 1966 (NHPA; Public Law 89-665; 16 U.S.C. 470 et seq.) is intended to preserve historical and archaeological sites in the United States of America. The act created the National Register of Historic Places, the list of National Historic Landmarks, and the State Historic Preservation Offices. Section 106 of the NHPA requires Federal agencies to take into account the effects of their undertakings on historic properties, and afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment. The historic preservation review process mandated by Section 106 is outlined in regulations issued by ACHP (36 CFR part 800). The Michigan State Historic Preservation Office (SHPO), which implements section 106 of the NHPA, is located in the Michigan State Housing Development Authority. NOAA has and continues to consult with the State Historic Preservation Officer on matters related to Section 106 of the NHPA. The SHPO concurred with NOAA's determination that sanctuary expansion will have no adverse effect on historic properties. A programmatic agreement will be developed after the expansion of the sanctuary becomes effective and if it is determined to be necessary.

Endangered Species Act (ESA)

NOAA's Fisheries Service and the FWS share responsibility for implementing the ESA. The ESA provides for informal consultation to take place between the U.S. Fish & Wildlife Service (FWS) and NMFS and Federal agencies to assist the Federal agency in determining whether formal consultation or a conference is required. Because NOAA's action pertains to the conservation of shipwrecks and maritime heritage resources and were determined to have no effect on ESA-listed species, NOAA did not consult with the relevant agencies under the ESA.

Regulatory Flexibility Act (RFA)

The Regulatory Flexibility Act (RFA), as amended and codified at 5 U.S.C. 601 et seq., requires an agency to prepare a regulatory flexibility analysis of any rule subject to the

notice and comment rulemaking requirements under the Administrative Procedure Act (5 U.S.C. 553) or any other statute, unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Under section 605(b) of the RFA, however, if the head of an agency (or his or her designee) certifies that a rule will not have a significant impact on a substantial number of small entities, the statute does not require the agency to prepare a regulatory flexibility analysis. Pursuant to section 605(b), the Chief Counsel for Regulation, Department of Commerce, submitted a memorandum to the Chief Counsel for Advocacy, Small Business Administration, certifying that original proposed rule would not have a significant impact on a substantial number of small entities. The rationale for that certification was set forth in the preamble (78 FR 35776; Jun. 14, 2013).

Executive Order 12866 Cost-Benefit Analysis

Under Executive Order 12866, if a rule is determined to be significant, then a socioeconomic impact study (i.e., assessment of the costs and benefits of the regulatory action) must be conducted. Under 12866 a regulatory action is significant if the rule may:

- have an annual effect on the economy of \$100 million or more or adversely affecting in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;
- create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- materially alter the budgetary impacts of entitlements, grants, user fees, or loan programs, or the rights and obligations of recipients thereof; or
- raises novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order.

NOAA has concluded that the final rule analyzed in this FEIS is not significant under E.O. 12866. The Office of Management and Budget has concurred with this conclusion.

Executive Order 13132 Federalism

Under Executive Order 13132, each agency must consult, to the extent practicable and permitted by law, with State and local officials early in the process of developing regulations. These consultations should seek comment on the compliance costs or preemption, as appropriate to the nature of the rulemaking under development. NOAA has concluded this regulatory action does not have federalism implications sufficient to warrant preparation of a federalism assessment under Executive Order 13132.

When an agency submits a draft final regulation to OMB for review under Executive Order 12866 prior to promulgation of the final regulation, the agency must include a separately identified portion of the preamble to the regulation as a "federalism summary impact statement" that must include:

- a description of the extent of the agency's prior consultation with State and local officials;
- a summary of the nature of their concerns and the agency's position supporting the need to issue the regulation; and

- a statement of the extent to which the concerns of State and local concerns have been met.

The ONMS has worked closely with partner agencies within the State of Michigan and the Federal government in the development of this FEIS. During the 2007 TBNMS management plan review process, NOAA established a working group of the Sanctuary Advisory Council to evaluate whether the sanctuary boundary should be expanded to protect, manage, and interpret additional shipwrecks and other potential maritime heritage resources within Lake Huron. The boundary expansion working group identified and considered a 4,110-square-mile area that extended the current sanctuary south into Alcona County, north into Presque Isle County, and east to the international border with Canada. The study area was identified based on the density of both known and undiscovered resources, the historical, archaeological, and recreational significance of individual and collective resources, and the maritime landscape. On May 22, 2007, the boundary expansion working group presented this recommendation to the Sanctuary Advisory Council, which then passed a resolution in support of the area. Based on this resolution, Senator Carl Levin introduced two sanctuary expansion bills into the U.S. Congress, but they were never brought to a vote.

In 2009, NOAA published a revised management plan.¹² In response to the Sanctuary Advisory Council's resolution, the management plan included a strategy to "evaluate and assess a proposed expansion of the sanctuary to a 3,662-square-mile area from Alcona County to Presque Isle County, east to the international border with Canada to protect, manage, and interpret additional shipwrecks and other potential maritime heritage resources" (Strategy RP-1). This action plan formed the basis for NOAA's current proposed action. (When added to the existing TBNMS boundary, this 3,662-square-mile area results in a total sanctuary area of 4,110 square-miles.) In April 2012, NOAA held three public scoping meetings on the concept of boundary expansion in Alpena, Harrisville, and Rogers City, MI. In addition, NOAA received several written public comments on boundary expansion, most of which were in support. In fact, several commenters suggested a slightly larger area than 4,110 square-miles to protect an additional five historic shipwrecks. This larger area, for a total of 4,300 square miles, is the final boundary described in this action. The rule proposed to increase the geographic size of the sanctuary from 448 square miles to 4,300 square miles and more than double the number of nationally significant shipwrecks protected under the NMSA.

The State of Michigan, the primary state agency affected by management of TBNMS, was consulted throughout the process of exploring the concept and designation of an expansion of the sanctuary.

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

Concurrent with the development of this rulemaking, NOAA invited the Chippewa Ottawa Resource Authority (CORA) to participate in government-to-government consultation.

¹² <http://sanctuaries.noaa.gov/management/mpr/tbnmsmp.pdf>

CORA is the organizing body for representatives from the Bay Mills Indian Community, Grand Traverse Band of Ottawa and Chippewa Indians, Little River Band of Ottawa Indians, Little Traverse Bay Bands of Odawa Indians, Sault Ste. Marie Tribe of Chippewa Indians. NOAA made changes to TBNMS regulations as a result of consultation under E.O. 13175.

Responses from the following other agencies to consultation letters are included below.

- Michigan Department of Environmental Quality
- Michigan Air National Guard
- Michigan State Historic Preservation Office
- U.S. Department of Interior
- U.S. Department of Transportation – Maritime Administration



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



DAN WYANT
DIRECTOR

August 9, 2013

Mr. Jeff Gray, Superintendent
Thunder Bay National Marine Sanctuary
500 West Fletcher Street
Alpena, Michigan 49707

Dear Mr. Gray:

SUBJECT: Federal Consistency Determination, Proposed Thunder Bay National Marine Sanctuary Boundary Expansion

Staff of the Water Resources Division has reviewed this phase of the project for consistency with the Michigan Coastal Management Program (MCMP), as required by Section 307 of the Coastal Zone Management Act, PL 92-583, as amended (CZMA). Thank you for providing the opportunity to review this proposed activity. Our review indicates that this project is located within Michigan's coastal management boundary and is subject to consistency requirements.

A determination of consistency with MCMP requires evaluation of a project to determine if it will have an adverse impact on coastal land or water uses or coastal resources. Projects are evaluated using the permitting criteria contained in the regulatory statutes administered by the Department of Environmental Quality. These statutes constitute the enforceable policies of the Coastal Management Program.

No adverse impacts to coastal resources are anticipated from the project as described in the information you forwarded to our office. Issuance of all required permits certifies the activity for which the permits were issued as consistent with MCMP. As no state permits are required for this boundary change, this activity shall be considered consistent as of the date of this letter.

This consistency determination does not waive the need for permits that may be required under other federal, state or local statutes. Please call me if you have any questions regarding this review.

Sincerely,

Chris Antieau
Great Lakes Shorelands Unit
Water Resources Division
517-373-3894



MICHIGAN AIR NATIONAL GUARD
HEADQUARTERS ALPENA COMBAT READINESS TRAINING CENTER
5884 A. STREET
ALPENA, MI 49707-8125

5 June 2014

MEMORANDUM FOR NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
ATTENTION: MR. JEFF GRAY AND MR. RUSS GREEN

FROM: ALPENA CRTC/CC

SUBJECT: Impact of NOAA's Proposal for Expansion of Thunder Bay Marine Sanctuary

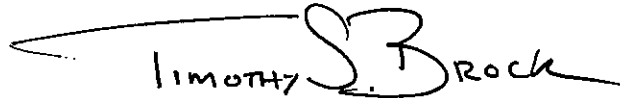
1. It has come to my attention that the National Oceanic and Atmospheric Administration (NOAA) is proposing to expand the Thunder Bay National Marine Sanctuary (Re: 15 CFR Part 922, Docket No. 130403324-3376-01). "Alternative C" of the proposed expansion overlaps the boundaries of Restricted Area (R-4207) used by Alpena Combat Readiness Training Center (CRTC) for military operations as issued by the Federal Aviation Administration (FAA). Alternatives A and B do not encroach on R-4207. Therefore, it is my goal to inform and mitigate potential conflicts of the overlapping areas should Alternative C be passed into law.

2. As the proposed rule suggests, the marine sanctuary is established to protect and preserve shipwrecks in a 4,300 square mile portion of Northwest Lake Huron. The upper echelons of these wrecks are located along the coastline, but from what appears to be a "boundary of convenience," the marine sanctuary's proposed boundaries would extend to the US/Canadian border where very few wrecks are known. As currently drawn, there are less than ten "known wrecks" and "potential wrecks" within R-4207, all of which are relatively close to the perimeter.

3. The Alpena CRTC is a unique training site in the Air National Guard, receiving transient units from around the US and the world. Part of what makes the Alpena CRTC a unique and viable asset to the military is the availability of R-4207 for pilot training. The Air National Guard's philosophy is to provide a ready and relevant force. Our members rely on the local economy for many of their daily needs (e.g. food, recreation, personal care, etc.). Similarly, the Marine Sanctuary has also been a great asset to the local economy through its draw of tourism. Therefore, for the continued success of each organization and Alpena in general it is imperative that the boundaries and procedures of our two organizations, both existing and proposed are clear and non-restrictive.

4. NOAA's two primary concerns stated in the proposed rule are the use of grappling hooks and anchoring devices on marked sites and the "hand-taking" of artifacts. The CRTC's current use of R-4207 involves neither of these activities. We request the opportunity to provide further comment in the event a new wreck is discovered in the confines of R-4207 and further request that NOAA better define section III of the proposed rule, specifically "...the types of activities subject to regulation by NOAA to protect those characteristics." Upon receipt of the list of the "types of activities subject to regulation by NOAA", and after a more accurate site location map or table of coordinates is provided" I request time to review, assess impacts and provide comment before further action is taken.

5. 'Alternative C' of the proposed Marine Sanctuary expansion will limit some training activities, but, based on the layout of known wrecks in training areas, current training can be shifted around known wrecks without significant negative impact. However, potential wrecks located in the future may have greater impacts if their configuration is spread across larger and/or new areas. I appreciate your time and attention to this matter, and I look forward to hearing back from you. Please do not hesitate to call my office with any questions: (989) 354-6205.

A handwritten signature in black ink that reads "TIMOTHY S. BROCK". The signature is stylized, with a long horizontal line extending to the left of the name, and the letters "S" and "B" are particularly prominent and connected.

TIMOTHY S. BROCK, Lt Col, MI ANG
Commander

cc:

NGB/A7AM, Ms. Anne Rowe

NGB/A3AA, Mr. Shawn McHenry



STATE OF MICHIGAN

MICHIGAN STATE HOUSING DEVELOPMENT AUTHORITY
STATE HISTORIC PRESERVATION OFFICE

RICK SNYDER
GOVERNOR

SCOTT WOOSLEY
EXECUTIVE DIRECTOR

September 6, 2013

RUSS GREEN
THUNDER BAY NATIONAL MARINE SANCTUARY
500 WEST FLETCHER STREET
ALPENA MI 49707

RE: ER97-861 Thunder Bay National Marine Sanctuary Boundary Expansion, Alpena and
Montmorency Counties (NOAA)

Dear Mr. Green:

Under the authority of Section 106 of the National Historic Preservation Act of 1966, as amended, we have reviewed the above-cited undertaking at the location noted above. In our letter dated August 7, 2013 we provided preliminary comments on the draft Environmental Impact Statement (DEIS), and expressed our agreement with the proposed expansion. This letter serves to provide our formal comment as requested in the cover letter accompanying the DEIS document.

Based on the information provided for our review, the State Historic Preservation Officer (SHPO) concurs with the determination of NOAA that the effects of the proposed undertaking do not meet the criteria of adverse effect [36 CFR § 800.5(a)(1)]. Therefore, the project will have **no adverse effect** [36 CFR § 800.5(b)] on, historic properties within the area of potential effects for the above-cited undertaking.

This letter evidences NOAA's compliance with 36 CFR § 800.4 "Identification of historic properties" and 36 CFR § 800.5 "Assessment of adverse effects," and the fulfillment of NOAA's responsibility to notify the SHPO, as a consulting party in the Section 106 process, under 36 CFR § 800.5(c) "Consulting party review." **If the scope of work changes in any way, or if artifacts or bones are discovered, please notify this office immediately.**

If you have any questions, please contact Brian Grennell, Cultural Resource Management Specialist, at (517) 335-2721 241-6062 or by email at GrennellB@michigan.gov. **Please reference our project number in all communication with this office regarding this undertaking.**

Finally, the State Historic Preservation Office is not the office of record for this undertaking. You are therefore asked to maintain a copy of this letter with your environmental review record for this undertaking. Thank you for this opportunity to review and comment, and for your cooperation.

Sincerely,

Martha MacFarlane-Faes
Deputy State Historic Preservation Officer

MMF:DLA:BGG





IN REPLY REFER TO:

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Custom House, Room 244
200 Chestnut Street
Philadelphia, Pennsylvania 19106-2904



August 14, 2013

9043.1
ER 13/0420

Jeff Gray, Superintendent
Thunder Bay National Marine Sanctuary
500 W. Fletcher St.
Alpena, Michigan 49707

Dear Mr. Gray:

The U. S. Department of the Interior (Department) has no comment on the Draft Environmental Impact Statement (DEIS) and Proposed Boundary Expansion of Thunder Bay National Marine Sanctuary located in Alpena County, Michigan.

Thank you for the opportunity to comment.

Sincerely,

Lindy Nelson
Regional Environmental Officer



U.S. Department
of Transportation

**Maritime
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

June 4, 2014

JUN 09 2014

Mr. Daniel J. Basta
Director, Office of National Marine Sanctuaries
National Oceanic and Atmospheric Administration
United States Department of Commerce
1305 East-West Highway
Silver Spring, MD 20910

Dear Mr. Basta:

Thank you for your letter of May 9, 2014, to the Secretary of Transportation, providing notice of the National Oceanic and Atmospheric Administration (NOAA) amendment to the proposed rule for the expansion of the Thunder Bay National Marine Sanctuary (TBNMS). I have been asked to respond.

As the operating administration within the U.S. Department of Transportation most concerned with commercial navigation, the Maritime Administration appreciates the opportunity to comment on the proposed amendment. We appreciate the notice's clarification that ballasting operations within the Sanctuary to ensure the safety, control, trim and stability of vessels are an allowable activity. We support NOAA's continuing efforts to accommodate all legitimate uses of the sea, including commercial navigation, while implementing measures to protect our maritime heritage and the natural environment.

If you have any further questions regarding this matter, please contact Mr. Michael Carter, Director of the Office of Environment, at (202) 366-9431.

Sincerely,

John P. Quinn
Associate Administrator for
Environment and Compliance



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Recyclable

G. Response to Public Comments

National Environmental Policy Act

When changing a term of designation of a national marine sanctuary, section 304 of the NMSA (16 U.S.C. 1434) requires the preparation of a draft environmental impact statement (DEIS), as provided by the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.) and that the DEIS be made available to the public. The DEIS was released on June 14, 2013 (78 FR 35928). The public comment period ended on December 19, 2013.

During the public comment period, one hundred and eight (108) written comments were received through the eRulemaking Portal <http://www.regulations.gov>. Three (3) public hearings were also held to receive comment. The written comments were compiled and grouped by general topics. Substantive comments are summarized below, followed by NOAA's response. Similar comments have been treated as one comment for purposes of response.

SUPPORT FOR EXPANSION

1. Comment: Sanctuary expansion will have a positive impact on cultural resource protection by including an additional 47 known shipwreck sites in the sanctuary's research and resource protection programs. Expansion will also have a positive impact on local and regional economies through increased heritage tourism and visiting researchers. Communities in the expanded area are also looking forward to increased education and outreach partnership opportunities.

Response: NOAA agrees and is moving forward with the boundary expansion process.

TRIBAL TREATY RIGHTS

2. Comment: The DEIS and proposed rule do not contain the clear and unambiguous statement that Treaty secured fishing rights shall not now, or in the future be impaired or impeded by NOAA in the exercise of its regulatory authority. Indian tribes who fish in the expanded sanctuary believe the existing TBNMS regulations are ambiguous.

Response: NOAA conducted government-to-government consultations with federally recognized tribes that fish in the current and proposed boundary of the sanctuary, as required by E.O. 13175. Based on this consultation, NOAA amended the regulations to clearly state that Treaty fishing rights are not impacted by sanctuary expansion. NOAA also added and defined the term "treaty fishing rights" in the TBNMS definitions at 15 CFR 922.191. This amendment sufficiently addresses concerns raised during the consultation that took place between the tribes and NOAA.

INVASIVE SPECIES

3. Comment: NOAA should review and potentially adopt vessel permitting programs in TBNMS, such as those from other marine protected areas managed by ONMS, specifically as it pertains to the spread of invasive species. NOAA should review the state of Hawai'i's

Administrative Rules Chapter 13-76 pertaining to invasive species and assess their applicability to TBNMS.

Response: NOAA believes invasive species are currently well-managed by other Federal and state agencies with jurisdiction over vessel operations in the Great Lakes. Additional NOAA regulations within the TBNMS would not significantly improve the management regime that already exists for invasive species. For the same reasons, NOAA does not believe that additional regulations relating to hull fouling are needed to protect sanctuary resources. Hawai'i's Administrative Rules are not readily applicable to protecting maritime heritage resources in the Great Lakes, which is the purpose of TBNMS. Each national marine sanctuary has its own set of regulations tailored specifically to resource protection needs of that sanctuary. Therefore, NOAA is not altering the permitting framework with respect to TBNMS.

4. Comment: The discussion in the environmental impact statement should include data on vessel traffic in the Great Lakes and its impact on sanctuary resources.

Response: Analyzing data on vessel traffic throughout the Great Lakes is beyond the scope of this federal action. The operation and common practices of commercial vessels in the Great Lakes are not affected by the expansion of the sanctuary, and whatever effect they may have on sanctuary resources (if any) would occur regardless of sanctuary expansion. Therefore no additional environmental analysis is required.

5. Comment: With the rise of the impact of invasive mussels on shipwrecks, the best way to preserve artifacts is to allow sport divers and commercial salvage companies to remove artifacts from the underwater site. The expansion of TBNMS would not allow removal of artifacts from the dozens or hundreds of shipwrecks located in the expansion area, which would prevent the preservation of many artifacts before they are smothered by invasive mussels.

Response: Salvage of underwater artifacts is prohibited by both NOAA and State of Michigan regulations. As such, should the expansion of TBNMS not occur, salvage would still be prohibited under State law. Additionally, NOAA does not believe salvage of artifacts is in congruence with the TBNMS resource protection mission, nor is it a viable strategy for meeting the challenge of invasive mussels.

APPROPRIATE TYPE OF PROTECTION

6. Comment: The Thunder Bay Underwater Preserve provides adequate protection to the region's underwater cultural resources; there is no need to duplicate efforts.

Response: Designation of the sanctuary was intended to build on and strengthen the Thunder Bay Underwater Preserve, which was designated by the state of Michigan in 1981. The management of Thunder Bay National Marine Sanctuary is a partnership between NOAA and the State of Michigan. NOAA and the State work together to ensure they do not duplicate each other's efforts. Given the additional financial resources and legal authorities NOAA has to offer, joint management between the State of Michigan and NOAA provides

opportunities that neither could offer on its own. There are numerous benefits associated with a national marine sanctuary, including enhanced opportunities for research and long-term monitoring, additional development of education and outreach efforts, and increased support for enforcement. The designation of an area as a sanctuary draws attention to the fact that the area is nationally significant and worth protecting on a national level.

For a more complete discussion of the differences between State law and Sanctuary regulations, see: Section 5, Regulatory Alternatives, of the original Final Environmental Impact Statement/Management Plan, May 1999; the Final Environmental Impact Statement for Boundary Expansion, August 2014; Thunder Bay National Marine Sanctuary Condition Report, February 2013.

7. Comment: Designation of the sanctuary will result in the loss of State control of Lake Huron, and a takeover of both management and regulation of the area by the Federal government.

Response: Thunder Bay National Marine Sanctuary does not change the ownership or control of State lands or waters; that is, no loss of State or tribal sovereignty has occurred, or will occur, as a result of national marine sanctuary designation or expansion. NOAA and the State agree that the State's jurisdiction and rights will be maintained and will not be relinquished, and all existing State laws, regulations, and authorities remain in effect. A Memorandum of Understanding (MOU) for the joint management of TBNMS between the State of Michigan and NOAA contains several provisions to address this concern. A key provision states: "The State of Michigan has not conveyed title to or relinquished its sovereign authority over any State owned submerged lands or other State owned resources, by agreeing to include those submerged lands and resources."

8. Comment: Because TBNMS is being expanded for the purpose of protecting maritime cultural heritage resources, federal restrictions that apply within national marine sanctuaries designated for the purpose of protecting ecological resources should not apply.

Response: National marine sanctuaries are managed as a system by NOAA's Office of National Sanctuaries. The National Marine Sanctuaries Act authorizes NOAA to designate and protect as national marine sanctuaries areas of the marine or Great Lakes environment that are of special national significance due to their conservation, recreational, ecological, historical, scientific, cultural, archeological, educational, or esthetic qualities. The statute does not distinguish the specific resources of particular sanctuaries. Therefore, it is immaterial whether a site is designated for its ecological or cultural characteristics (or both), because all are designated national marine sanctuaries under the statute. For this same reason, other government agencies' regulations or guidelines that refer to national marine sanctuaries do not distinguish sanctuaries based on the specific resources it is designated to protect. As envisioned by Congress, only the individual national marine sanctuary regulations are tailored to the specific resources that the national marine sanctuary is mandated to protect. In this instance, the regulations that NOAA promulgated for TBNMS are focused on protecting the shipwrecks and maritime heritage resources of the sanctuary.

DIVER ACCESS

9. Comment: Will sanctuary expansion limit diver access to shipwrecks within the sanctuary? Will NOAA release the coordinates of new shipwrecks, unlike when the M.F. Merrick and Etruria were found in 2011 and the coordinates were kept secret?

Response: Sanctuary regulations do not prohibit or limit access to shipwrecks within the current or expanded sanctuary; there is no access restriction for diving on the shipwrecks in TBNMS. TBNMS fosters free and open access to all underwater cultural resources within sanctuary boundaries.

However, on rare occasions (and it has not happened to date at TBNMS), TBNMS may need to place temporary emergency limits on access to a shipwreck for purposes of resource protection. This action would be accomplished through imposition of an emergency regulation pursuant to 15 CFR 922.196. NOAA has not promulgated such regulations since the sanctuary's designation in 2000. In accordance with TBNMS regulations and the MOU with the State, NOAA cannot impose a temporary emergency regulation without the approval of the Governor of Michigan.

Similarly, NOAA may decide to withhold the release of coordinates of a newly discovered, historically significant shipwreck for a period of time so that NOAA and the State can document the site and its artifacts. Under this scenario, NOAA will use agency and partner resources (and possibly volunteers) to document the site. Once documented, the public would be provided full access to the site.

MANAGEMENT FRAMEWORK

10. Comment: Does NOAA have to apply and be granted permits from the State of Michigan to remove or salvage artifacts from Michigan shipwrecks?

Response: NOAA is required to consult with the Michigan State Underwater Archaeologist and Michigan State Archaeologist to conduct activities that may require a state permit, and apply for a permit (currently, through Michigan Department of Environmental Quality and the Office of the State Archaeologist) should one be deemed necessary. In addition, the procedures and criteria for securing a sanctuary permit are set forth in 15 C.F.R. 922.195.

11. Comment: How will the sanctuary come up with the funds to adequately manage the sanctuary?

Response: An increase in the TBNMS budget does not automatically accompany sanctuary expansion. Within its current budget, and with supplemental funds from grants and partners, NOAA would provide effective management of sanctuary resources, including on-water research, outreach and education in the expanded sanctuary boundary. More information on TBNMS management can be found in the 2008 final management plan, which is available at www.thunderbay.noaa.gov, and in the 2013 Thunder Bay Condition Report found at <http://sanctuaries.noaa.gov/science/condition/tbnms/>.

12. Comment: Many of the 200 estimated wrecks included in sanctuary expansion are of no real historical or archaeological value. NOAA has not established that the entire area within the proposed expanded boundary is of special significance.

Response: The collection of 92 known shipwrecks located within the entire new sanctuary boundary represents a large diversity of vessels that navigated the Great Lakes in the 19th and 20th centuries, which NOAA believes, per section 303(a)(2) of the NMSA are of special national significance. This is based on a NOAA-funded study conducted in the Thunder Bay region during pre-designation of the sanctuary that indicated these shipwrecks would likely qualify as a National Historic Landmark. In addition, several of the known shipwrecks individually have potential national historic significance, e.g., Isaac M. Scott, which foundered in the Great Storm of 1913 (See Section 4 of the FEIS/MP for a complete discussion of these shipwrecks). The expanded boundary was chosen because it includes shipwrecks of particular historical, archeological and recreational value that complement those within the sanctuary's current boundaries. See also the 2013 Thunder Bay National Marine Sanctuary Condition Report. See the 2013 Thunder Bay National Marine Sanctuary Condition Report (<http://sanctuaries.noaa.gov/science/condition/tbnms/>) for a detail description of the historical and archaeological significance of the resources. The boundary of the sanctuary was chosen to include as many of the shipwrecks in this collection as possible in a shape that would be easily represented on nautical charts.

13. Comment: NOAA will have to spend millions of dollars to remove mussels to study the sites of these additional shipwrecks.

Response: Despite the presence of invasive mussels, Great Lakes shipwrecks possess high archeological, historical and recreational value, and NOAA has been able to carry out effective research, resource protection and education programs since sanctuary designation in 2000. NOAA does not envision the large scale removal of invasive mussels, but rather selected mussel removal where the benefit of retrieving significant archeological information outweighs any potential damage to a shipwreck site or artifact. Given the scale of invasive mussel infestation in Lake Huron, it is unreasonable and unnecessary to remove all mussels from all shipwrecks in order to achieve significant public benefits. A more thorough discussion of invasive mussels and the impact on sanctuary shipwrecks can be found in the 2013 Thunder Bay Condition report at <http://sanctuaries.noaa.gov/science/condition/tbnms/>.

EXPANSION PROCESS

14. Comment: Why did NOAA conduct the expansion hearings rather than the State of Michigan or a federal entity?

Response: NOAA was carrying out its statutory duty. Section 304(a)(3) of the NMSA requires NOAA to conduct public hearings and receive views of interested parties whenever the agency is designating or amending the designation of a national marine sanctuary. NOAA's actions were consistent with the laws governing public review of Federal actions. In addition, because TBNMS is jointly managed with the State of Michigan, appropriate state agencies were consulted during the entire expansion process.

15. Comment: Why were the hearings not held in Lansing?

Response: Section 304(a)(3) of the NMSA requires public hearings to be held in the areas most affected by the expansion. Given this, NOAA selected communities that were the most likely to be affected by the expansion of the sanctuary. Recognizing that it is not cost-effective to hold hearings in every community, NOAA also accepted submissions of public comments by mail as well as electronically during a public comment period that extended from June 14 to December 19, 2013. NOAA afforded the public an additional opportunity to express views when the agency published the amended proposed rule and reopened the public comment period from May 9, 2014 through June 9, 2014.

16. Comment: Who votes on expansion and when?

Response: No one actually votes on expansion. Rather, the sanctuary boundary expansion process was part of an administrative action led by NOAA, which included significant opportunity for public input during the scoping period (April 12 through May 25, 2012) as well as during the public comment period on the proposal (June 14 to December 19, 2013). Additionally, expansion was a major issue addressed in Thunder Bay's Management Plan Review process that took place between 2006 and 2009. As part of this process, there were numerous opportunities for public comment. Ultimately, the Management Plan included a strategy for the sanctuary to explore boundary expansion, as recommended by a 2007 SAC resolution. For more information see:

http://thunderbay.noaa.gov/management/management_plan.html

All public comments were reviewed, analyzed, and integrated in the final action. As a result, NOAA, in collaboration with the State of Michigan, under authority given by the National Marine Sanctuaries Act (16 U.S.C. 1431 et seq.), is proposing to expand TBNMS.

17. Comment: With the current federal financial situation, why would NOAA want to expand its reach into the Great Lake rather than serve its core mission?

Response: NOAA's mission is "Science, Service, and Stewardship" and includes a specific goal to conserve and manage coastal and marine ecosystems and resources (<http://www.noaa.gov/about-noaa.html>). The expansion of TBNMS serves to further NOAA's core mission by protecting the nationally significant maritime heritage resources of the Thunder Bay region.

18. Comment: NOAA failed to include an analysis of cost and benefits required under section 303 (b)(1)(H) of the NMSA (16 U.S.C. 1431 et seq.) or an analysis of economic impacts in Regulatory Flexibility. Analysis required under the Regulatory Flexibility Act (5 U.S.C. §§601-602).

Response: NOAA believes it has adequately analyzed the environmental and socioeconomic impacts of this action in the environmental consequences section of the DEIS and FEIS, as well as in the classification section associated with the Regulatory Flexibility Act. NOAA did not include an extensive description of costs to the Great Lakes

shipping industry related to its action because no negative impacts to that industry are expected to result from this action.

19. Comment: NOAA failed to include an analysis of impacts under NEPA (42 U.S.C. 4321 et seq.) and failure to consult with appropriate stakeholders.

Response: See response above with regards to NOAA's analysis of impacts. NOAA disagrees with the commenter's statement that it did not conduct consultation with appropriate stakeholders. NOAA published a notice of intent to prepare a draft EIS on April 12, 2012 (77 FR 21878), followed by a public comment period of approximately 45 days. During this time, NOAA held three public scoping meetings to gather input from the communities on possible boundary expansion alternatives. In June 2013, NOAA published the proposed rule (78 FR 35776) and draft EIS and held another public comment period with public hearings, which was extended until December 2013. In response to the public comments that were received, NOAA amended the proposal and re-opened the comment period for another 30 days, from May 9, 2014 to June 9, 2014 (79 FR 26654). Therefore, NOAA believes it has more than adequately fulfilled the requirement to engage with stakeholders during a public process.

20. Comment: The Environmental Impact Statement (EIS) for boundary expansion should include an analysis of increased traffic on existing roadways, along with analysis of need to expand existing facilities and parking area. The EIS should evaluate the impact to surrounding wetlands and flood plains.

Response: NOAA does not believe that sanctuary expansion requires an analysis of increased traffic of existing roadways. Current sanctuary facilities and parking will adequately accommodate any increase in visitation resulting from sanctuary boundary expansion, and no new such facilities are currently in development. If NOAA pursues the development of a new facility or parking area in the future, it will comply with all requirements for public notification and review and will prepare an environmental analysis under NEPA as part of a separate public process. In addition, NOAA does not believe that boundary expansion would have any impact on wetlands or flood plains.

21. Comment: NOAA failed to include a resource assessment as required under section 304(a)(2)(B) of the NMSA.

Response: The EIS as a whole documents all of the topics covered in a resource assessment, such as "present and potential uses of the area, including commercial and recreational fishing, research and education, minerals and energy development [not applicable in TBNMS], subsistence uses, and other commercial, governmental, or recreational uses", and this analysis was available for public review from June 2013 to June 2014. Therefore, NOAA believes it has met all the requirements of the NMSA that apply to this action.

22. Comment: NOAA should reserve a seat for a marine industry representative on the TBNMS Sanctuary Advisory Council (SAC) to ensure continued industry input and engagement on management of the sanctuary.

Response: The issue of Sanctuary Advisory Council (SAC) composition was raised as early as 2007 when the concept of expanding the sanctuary was first discussed. Once sanctuary expansion is final, the SAC will discuss the possibility of changing the number and composition of its seats. In the meantime, any representative from the marine industry could apply to the business seat when the position is up for selection. There is also a period of time devoted to public comment during every SAC meeting, when anyone interested in matters related to TBNMS are welcome to attend and provide comment on the record. The TBNMS SAC meeting schedule can be found at [http://thunderbay.noaa.gov/management/advisory_council.html].

JURISDICTION OVER SHIPWRECKS

23. Comment: How will sanctuary expansion affect the Abandoned Shipwreck Act of 1987, which states that a shipwreck has to be both abandoned and “embedded” on the bottomlands in order for the state to own it.

Response: Sanctuary designation and subsequent boundary expansion has no effect on the Abandoned Shipwreck Act of 1987 and the state’s ownership of historic shipwrecks.

24. Comment: Does the maritime law of salvage trump sanctuary authority?

Response: The law of salvage is a concept in maritime law which states that a person who recovers another person's ship or cargo after peril or loss at sea is entitled to a reward commensurate with the value of the property so saved. In the case of TBNMS, all shipwrecks within the sanctuary are located on State of Michigan bottomlands. This means that any salvage that might take place in the sanctuary would require a state permit and review by the sanctuary. State of Michigan Public Act 154 and Public Act 452 of 1988 govern the recovery of submerged artifacts, and sanctuary regulations prohibit recovering, altering, destroying, possessing, or attempting to recover, alter, destroy or possess an underwater cultural resource.

ENFORCEMENT

25. Comment: Will enforcement just pertain to wrecks, or will it be expanded to a comprehensive program over the water and under the water?

Response: Law enforcement within TBNMS applies only to the enforcement of sanctuary regulations. All sanctuary regulations, as currently implemented, pertain solely to maritime heritage resources; any activity considered illegal by other regulations (such as those of another Federal agency), whether over or under the water, could not (and would not) be subject to NOAA enforcement authority.

BOUNDARY CONCERNS

26. Comment: There is a discrepancy between the narrative description and the actual coordinates of the proposed boundary.

Response: NOAA will update the final rule to ensure that the narrative description accurately reflects the precise location of the sanctuary’s proposed boundary.

27. Comment: The expansion should include some of the adjacent land as well, since there are parts of several wrecks that exist on land adjacent to the wrecks either because of natural phenomena or from human intervention.

Response: As agreed to by the State of Michigan and NOAA during the sanctuary's designation, the landward boundary of the sanctuary is defined by the Ordinary High Water Mark (see page 191 in the Thunder Bay National Marine Sanctuary and Underwater Preserve *Final Environmental Impact Statement (2000)*). The National Marine Sanctuaries Act (16 U.S.C. 1431 et seq.) directs NOAA to designation as marine national sanctuaries areas of the marine environment that meet certain criteria, where "marine environment" is defined as "those areas of coastal and ocean waters, the Great Lakes and their connecting waters, and submerged lands over which the United States exercises jurisdiction, including the exclusive economic zone, consistent with international law" (16 U.S.C. 1432 (3)). Therefore, NOAA would not have the authority to include adjacent lands in TBNMS.

28. Comment: NOAA should consider including in the Preferred Boundary Alternative several shipwrecks around Reynolds and Spectacle Reefs, near Cheboygan, Michigan.

Response: NOAA analyzed these areas in its Draft Environmental Impact Statement, and ultimately included these shipwrecks in its Preferred Boundary Alternative

29. Comment: The ports used for commercial shipping should not be included in the sanctuary expansion area.

Response: NOAA received several comments on the proposed rule regarding inclusion of the ports at Rogers City (also recognized as Calcite Quarry, Carmeuse), Presque Isle (also recognized as Stoneport Quarry), and Alpena (also recognized as LaFarge North America) within the proposed revised boundaries of TBNMS. In particular, the Governor of Michigan, the Lake Carriers' Association, the Canadian Shipowners Association, the Shipping Federation of Canada, local government officials, other commercial interests, and members of the general public requested these ports not be included within the boundary to avoid any limitation or prohibition on port operations "critical to the local, regional, and national economies." (A map of this expanded area, including the exclusion of the ports mentioned above, can be found on the TBNMS website at <http://thunderbay.noaa.gov/management/expansion.html>.) In response to these concerns, and because NOAA knows of no nationally significant maritime resources within these port areas, NOAA did not include the ports at Rogers City and Presque Isle within, and removed Alpena from, the revised TBNMS boundary in the final regulations.

30. Comment: NOAA should designate the sanctuary with boundaries restricted to a one-mile radius around each known and future discovered shipwreck.

Response: The final boundary configuration identified in the pending final rule would reflect considerable input and recommendations from a wide variety of interests in the

greater Thunder Bay region. (A history of the public's involvement with this process can be found at <http://thunderbay.noaa.gov/management/expansion.html>.) NOAA chose to analyze the alternatives in the DEIS based on this input and proposes to implement the boundary configuration of the preferred alternative, which received widespread public support.

31. Comment: The port of Alpena was never included in the original TBNMS boundary.

Response: The original boundary of TBNMS included the port of Alpena (65 FR 39042). The description set forth in 15 CFR 922.190 referred to the ordinary high water mark (OHWM) as the shoreward boundary of the sanctuary. However, the pending final rule would alter the boundary to remove the port of Alpena from the new boundary of the sanctuary.

DISCHARGES AND SHIPPING OPERATIONS

32. Comment: Sanctuary expansion would limit the ability of commercial ships to conduct routine ship operations, particularly ballasting, within the new sanctuary boundary. Specifically, the enforcement of U.S. Coast Guard (USCG) and U.S. Environmental Protection Agency (EPA) requirements regarding ballast water exchange would result in negative consequences to commercial shipping. Some commenters, including the Governor of Michigan, requested that the ports of Alpena, Rogers City and Presque Isle not be included in the boundary of the Thunder Bay National Marine Sanctuary.

Response: As a response to specific requests from the Governor of Michigan, the Lake Carriers' Association, the Canadian Shipowners Association, and the Shipping Federation of Canada, NOAA published an amended proposed rule (79 FR 26654) proposing to make changes to the boundary initially put forward for sanctuary expansion. Specifically, NOAA decided not to include the commercial ports at Presque Isle and Rogers City in the expanded sanctuary boundary. NOAA also excluded the port at Alpena from the original sanctuary boundary. The majority of ship ballasting occurs at these three ports. NOAA knows of no nationally significant maritime resources within these port areas; therefore, delineating a boundary that does not include these three ports does not result in any negative effects to the maritime heritage resources in that region. In addition, with this rulemaking NOAA is clarifying ballasting operations are consistent with the maritime heritage protection mission of the TBNMS, an allowable activity within the revised boundaries of the sanctuary (the response to question 33 below elaborates further on this issue).

33. Comment: The proposed expansion of TBNMS threaten the viability of the Great Lakes shipping industry due to USCG and EPA regulations prohibiting certain essential and unavoidable discharge of ballast water within the boundaries of a national marine sanctuary.

Response: According to many commenters, the uptake and discharge of ballast may occur while transiting the sanctuary "in response to weather conditions, to accommodate a port call, enter a restricted channel, or as part of routine operations known as trimming". To

illustrate when ballasting might be performed in response to weather conditions, one commenter explained: “Ballast is used to lower a vessel deeper into the water and by doing so stabilize the vessel so there is less exposure of a vessel’s profile to the winds.”

Another commenter highlighted the importance of ballast “trimming” by explaining a vessel may take on ballast water “to slow its speed and eventually come to a complete stop as it approaches a port and eventually reaches the dock.” Yet another commenter noted “The ‘trimming’ process involves the adjustment of levels of ballast water in the vessel for reasons that involve the safety, stability, and efficiency of the vessel. Some have analogized the trimming of a vessel to the necessary and important operational adjustments that an airline pilot makes as [the pilot] flies and lands an airplane”.

Consistent with these comments, the Great Lakes shipping industry requested that NOAA clarify, by the adoption of regulatory text or otherwise, that the uptake and discharge of ballast water in the sanctuary while transiting the lake is permissible, even in light of USCG and EPA requirements regarding the avoidance of ballast in areas such as national marine sanctuaries. NOAA seriously considered this request, and consulted with the USCG, EPA, and stakeholders to inform its decision-making. Based on information in the written comments, other literature on Great Lakes ballasting, and input from USCG and EPA on their respective requirements (which continues in effect) NOAA believes ballasting operations, to include safety and to control or maintain trim, draught or stability of the vessel, are consistent with the maritime heritage protection mission of the TBNMS, and therefore, are an allowable activity within the proposed boundaries of the sanctuary. As a result, no change was necessary to the regulations presented in the proposed rule or DEIS.

34. Comment: Expansion of the prohibition on discharge of bilge water, which originates in the U.S. Environmental Protection Agency (EPA)’s VGP restrictions, is unnecessary. Bilge water is highly regulated and is only discharged after processing through an oily water separator capable of producing an effluent with an oil content of less than 5ppm.

Response: In addition to USCG regulations (33 C.F.R. 151.10), bilge water is regulated by EPA (Section 2.2.2 of 2013 Vessel General Permit), which requires the operator to not to discharge treated bilge water into waters of a national marine sanctuary. However, EPA mentions that such discharge is allowed if necessary to maintain the stability and safety of the ship, which mitigates impact this regulation may have as a result of the expansion of TBNMS.

35. Comment: The proposed expansion will unnecessarily and inadvertently extend prohibitions on essential and normal bulk carrier operations, such as discharge of minimal quantities of benign dry cargo residues to such an area that it will severely disrupt or limit commercial marine operations. It is critical that shippers be allowed to wash down dry bulk cargo residue *at port* and *while underway* to prevent accumulation of cement dust which turns to hard cement under wet conditions.

Response: The USCG restrictions on the practice of washing down dry bulk cargo residue, known as dry cargo sweeping, apply within the original TBNMS boundary (33 CFR §151.66). This final rule does not result in any changes to those USCG regulations and dry

cargo sweeping will not be impacted. Moreover, dry cargo sweeping is prohibited by State law in all Michigan waters. For more information on state laws governing discharges practices, see Section 324.9502 and Subsection 9501(d) of Part 95, Watercraft Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

36. Comment: For safe vessel operations, vessels must be able to anchor if necessary to prevent damage to human life, property and the environment. It is not clear whether anchoring would be allowed in TBNMS.

Response: TBNMS regulations do not include a prohibition on anchoring in the sanctuary. The use of anchors or grappling hooks is prohibited only on underwater cultural resource sites that are marked with a mooring buoy. Moreover, the prohibition does not apply to any activity necessary to respond to an emergency threatening life or the environment.

37. Comment: NOAA should adopt regulations similar to those in Gray's Reef National Marine Sanctuary (GRNMS) to clarify that ballast water exchange would be allowed in TBNMS.

Response: The regulations for GRNMS prohibit "*operating a watercraft other than in accordance with the Federal rules and regulations that would apply if there were no Sanctuary*" (15 CFR 922.92(a)(4)). This does not mean that a watercraft, or vessel, could operate in GRNMS with disregard to other agencies' regulations, as implied by the commenter. The regulatory history of the GRNMS language shows that NOAA has historically required vessels "to be operated in accordance with Federal rules and regulations" (46 FR 7942). This means that any vessel in GRNMS should not only comply with sanctuary regulations but also with any other regulation by another government agency that pertains to vessels. Therefore, adopting a similar language in TBNMS would not, in fact, provide an exemption from the regulations and guidelines set forth by the USCG and EPA.

NATIONAL GUARD OPERATIONS

38. Comment: Alternative C of the proposed expansion overlaps the boundaries of Restricted Area (R-4207) used by Alpena Combat Readiness Training Center (CRTC) for military operations as issued by the Federal Aviation Administration (FAA). The Michigan Air National Guard (MANG) requests the opportunity to provide further comment in the event that a new wreck is discovered in the confines of R-4207 and requests that NOAA better define the types of activities subject to regulation by NOAA in the terms of designation.

Response: A list of activities subject to regulation by NOAA is found in Article IV, Section I of the terms of designation, which can be found in Section III of this final rule. NOAA has provided the MANG with a map depicting the location of the shipwrecks currently known in TBNMS. NOAA will initiate consultation with the MANG should a new wreck be found within the confines of R-4207.