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National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Thunder Bay National Marine Sanctuary
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MEMORANDUM FOR: John Armor, Director
Office of National Marine Sanctuaries

FROM: Jeff Gray, Superintendent
Thunder Bay National Marine Sanctuary



THROUGH: Matthew Brookhart, Acting Regional Director
Northeast and Great Lakes Region

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SUBJECT: Completion of the Evaluation of Sanctuary Management Plan

Pursuant to section 304(e) of the National Marine Sanctuaries Act (NMSA; 16 U.S.C. § 1434(e)), the National Oceanic and Atmospheric Administration (NOAA), Office of National Marine Sanctuary (ONMS) staff conducted an evaluation of the progress made toward implementing the Thunder Bay National Marine Sanctuary (TBNMS) Final Management Plan published in August 2009. Sanctuary staff also considered the prioritization of management goals. Based on this review, ONMS has determined that no urgent or immediate revisions to the management plan or the regulations are needed at this time. This evaluation demonstrates the sustained relevance of the goals, objectives, and priorities of the existing management plan.

Background

The 2009 TBNMS management plan represents the culmination of a multi-year process, which included extensive public involvement. The management plan is comprised of four action plans, and identifies a series of management strategies and activities under each action plan. The management plan was developed with a 5-10 year implementation horizon. NMSA section 304(e) requires NOAA to conduct a periodic review of the sanctuary management plans and goals (16 USC § 1434(e)). Specifically, NOAA must (1) evaluate the substantive progress toward implementing the management plan and goals for the sanctuary, including an evaluation of the effectiveness of site-specific management techniques and strategies; (2) include a prioritization of management objectives; and (3) revise the management plan and regulations as necessary to fulfill the purposes and policies of the NMSA.

Result of Internal Assessment

In fall 2017, TBNMS staff reviewed the substantive progress made toward implementing the four action plans identified in the [2009 TBNMS Management Plan](#), especially the effectiveness of site-specific management techniques and strategies. The result of this internal assessment can be found in the spreadsheet accompanying this memo and is summarized below.

The current management plan is organized into four action plans, and a series of management strategies and actions are identified under each plan (see Table 1):

1. Resource Protection
2. Education and Outreach
3. Research
4. Sanctuary Operations



Table 1: 2009 TBNMS Final Management Plan Action Plans

TBNMS Final Management Plan - Action Plans	
Resource Protection	
	RP-1. Evaluate and assess a proposed expansion of the sanctuary
	RP-2. Assess and evaluate recreational use of sanctuary resources
	RP-3. Increase compliance with sanctuary regulations and other applicable state and federal laws
	RP-4. Increase and encourage access and responsible use of sanctuary resources by fostering greater awareness among recreational user
	RP-5. Preserve and curate maritime heritage artifacts
Education and Outreach	
	ED-1. Increase awareness and knowledge of the sanctuary by developing education and outreach materials for a broader audience
	ED-2. Increase awareness and knowledge of the sanctuary through education and outreach programs
	ED-3. Enhance sanctuary communications to create greater awareness
	ED-4. Maintain and expand Thunder Bay National Marine Sanctuary community presence
	ED-5. Maximize the impact and effectiveness of education and outreach efforts, including interpretation at the Great Lakes Maritime Heritage Center and Trail, through ongoing evaluation
Research	
	R-1. Characterize the sanctuary's maritime heritage resources and landscape features
	R-2. Develop a monitoring program for sanctuary maritime heritage sites
	R-3. Continue partnership with Alpena County George N. Fletcher Public Library to manage the Thunder Bay Sanctuary Research Collection
	R-4. Develop partnerships with local, state, national, and international researchers and organizations to enhance sanctuary research programs
	R-5. Utilize volunteers, students, fellows, and interns for sanctuary characterization, research, and monitoring
Sanctuary Operations	
	SO-1. Develop infrastructure to enhance and maintain the Great Lakes Maritime Heritage Center
	SO-2. Develop infrastructure for research vessels and equipment and field operations
	SO-3. Hire staff and utilize volunteers to support existing, new, or expanded sanctuary operations, resource protection, education and outreach, and research programs
	SO-4. Develop partnerships and identify outside funding to support sanctuary operations and resource protection, education and outreach, and research programs
	SO-5. Enhance operation of the Thunder Bay Sanctuary Advisory Council
	SO-6. Develop procedures to ensure safety for staff and sanctuary visitors

Since the publication of the 2009 management plan, TBNMS has made significant progress in implementing the strategies associated with these action plans. Major accomplishments include but are not limited to:

Resource Protection Action Plan

- On September 5, 2017, the boundary of Thunder Bay National Marine Sanctuary was expanded from 448 square miles to 4,300 square miles. The new boundary includes the

waters of Lake Huron adjacent to Michigan's Alcona, Alpena and Presque Isle counties to the Canadian border. The sanctuary now protects an additional 100 known and suspected historic shipwreck sites. See Strategy RP-1.

- Installed 44 mooring buoys to provide better recreational access to shipwrecks and increase diver safety, while greatly reducing the likelihood of anchor damage. Sanctuary regulations prohibit the use of grappling hooks or other anchoring devices on maritime heritage resource sites if a mooring buoy is present. Mooring buoys are deployed seasonally to avoid ice and storm damage during winter months. See Strategy RP-4.

Education and Outreach Action Plan

- Since its designation, the sanctuary has become an economic driver for the city of Alpena and the Northeast Michigan region. The sanctuary's Great Lakes Maritime Heritage Center (GLMHC) attracts nearly 100,000 visitors annually, and is one of the largest attractions in the region. Since the opening of the GLMHC's permanent exhibits in 2008, the facilities and interpretation have been improved and expanded, including the addition of a green roof and a dedicated theater for the *Science on a Sphere*. *Science on a Sphere* provides STEM education through the animated images of atmospheric storms, climate change, and ocean temperature shown on the sphere, which is used to explain complex environmental processes in a simultaneously intuitive and captivating way. Additionally, the GLMHC's theater and education room received substantial technological upgrades. The exhibits, programming and interpretation at the GLMHC significantly expanded. See Strategy SO-1.
- Annually, the community is engaged in learning about the rich cultural history and importance of the ocean and Great Lakes through the Thunder Bay Maritime Festival and Thunder Bay International Film Festival, which draws over 10,000 visitors from across the United States. See Strategy ED-4.
- In addition to hosting annual Regional ROV competitions and mentoring dozens of ROV teams, Thunder Bay hosted the annual MATE (Marine Advanced Technology Education) International Student ROV Competition in 2014. The theme of the competition was "Exploring the Great Lakes: shipwrecks, science, and conservation in Thunder Bay National Marine Sanctuary." The competition brought 59 teams from 13 countries and 18 states and more than 1,000 attendees to Alpena. The competition uses underwater robotics to teach science, technology, engineering and math (STEM) and prepare students for careers in marine technology. See Strategy ED-2.

Research Action Plan

- Since 2009, five additional shipwrecks have been added to the National Register of Historic Places (*Pewabic, Norman, Kyle Spangler, Grecian, and Joseph S. Fay*) and another two nominations have been submitted and are under review (*Etruria and M.F. Merrick*.) The National Register of Historic Places is the official list of the Nation's historic places worthy of preservation and provides coordination and support of public and private efforts to identify, evaluate, and protect America's historic and archeological resources. See Strategy R-1.
- With assistance from various offices within NOAA and other partners, remote sensing surveys have been undertaken within the sanctuary and surrounding waters. These surveys have included side-scan sonar, Light Detection and Ranging (LIDAR), and high-resolution aerial photogrammetry surveys. Approximately 72 % of the sanctuary's pre-expansion

boundary (320 sq. miles) and 16% of the sanctuary's expanded boundary area (706 sq. miles) have been surveyed. See Strategy R-1.

- Digitization of the Thunder Bay Sanctuary Research Collection, 15,000 files of donated Great Lakes data and maritime history documents, was completed. Housed at the Alpena County's George N. Fletcher Public Library, staff developed a searchable interface for the collection that allows users to retrieve information using the Michigan Electronic Library or internet search engines. See Strategy R-3.

Sanctuary Operations Action Plan

- Established in 2010 by local community leaders, the Friends of Thunder Bay National Marine Sanctuary is a nonprofit 501(c)3 that supports the sanctuary's education programs, community outreach efforts, unique museum experiences, and research. See Strategy SO-4.
- Since 2009, TBNMS has leveraged inter and intra-agency partnerships to bring \$749,750 into the sanctuary in support of research operations and resource protection. See Strategy SO-4.

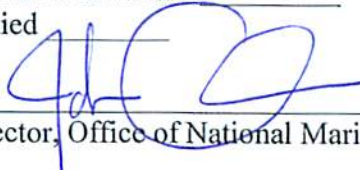
Staff participated in an online survey to gather context in preparation for a 2.5-day internal workshop in December 2017 to discuss, assess, and rate the level of completion for each of the activities in the management plan, in order to evaluate the effectiveness of site-specific management strategies. Since 2009, 37 percent of all activities within the management plan (21 of 57 activities) were partially or fully completed. Most of the action plans contain activities that were not completed and would benefit from further efforts. This lack of completion does not indicate that staff directed their efforts toward other goals or that the objectives of the management plan have lost relevance. Rather, 72 percent of the plan's activities (41 of 57) are designed as ongoing functions (*e.g.*, monitoring programs, education programs, etc.), so while they are being implemented they are not considered "completed." In a few cases, some activities were rated both as completed and ongoing. For example, one activity is to *"make artifacts available to the public and to professionals via exhibits, loans, and selected access to the artifact collection (Strategy RP-5)."* This has been completed for the current artifacts but will continue to be implemented as more artifacts enter the collection. Staff also prioritized the management objectives by discussing on which activities the sanctuary should spend the most effort in the next few years and whether the current strategies were meeting the objectives laid out in the management plan. Sanctuary management intends to use the results of a survey to the Sanctuary Advisor Council (SAC) to solidify priorities in the future.

The human and environmental setting has not changed significantly since 2009, although the geographic extent of the sanctuary grew significantly in the 2014 expansion. While the sanctuary expanded, the types of activities and programs done by TBNMS have not changed focus but rather expanded geographically. Therefore, most strategies can appropriately continue to be employed as prioritized in the 2009 management plan as they are still relevant to the sanctuary's goals and objectives. The four action plans are still relevant and TBNMS will continue to direct its efforts towards these action plans and pursue strategies to address them. Therefore, the internal assessment showed that most of the action plans within the 2009 management plan accurately reflect current management priorities and resource protection issues for TBNMS and are adequate to continue guiding TBNMS operations and programs at this time. The management plan evaluation showed that all but

one1 of the strategies in the 2009 management plan accurately reflect current management priorities and resource protection issues for TBNMS, and are adequate to continue guiding TBNMS operations and programs at this time.

Conclusion

The completion of this evaluation of the 2009 TBNMS management plan satisfies the requirements of NMSA section 304(e). Based on this review, no immediate or urgent revisions to the management plan or to the regulations are needed at this time. I will share the results of this evaluation with the SAC at its public meeting on April 24, 2018. While our team has found that the priorities laid out in the existing management plan are adequate to continue guiding TBNMS operations, we intend to begin discussions with the SAC about initiating a process and establishing a timeline to modify and potentially update the management plan.

Approved as written <input checked="" type="checkbox"/>	Approved with modifications (<i>See below</i>) _____
Denied _____	Request for additional information _____
 _____ Director, Office of National Marine Sanctuaries	<u>3/9/2018</u> _____ Date

¹ Strategy RP-1 discussed the expansion of TBNMS, which was completed in 2014 and is no longer relevant.

THUNDER BAY NATIONAL MARINE SANCTUARY

Action Plan	Activity Implementation Status			
	Completed	Partially Completed	Ongoing	No Action
	These activities have been fully implemented as outlined in the 2009 management plan language	Sanctuary staff have started working on these activities, but they have not been fully implemented	These activities are based around the idea of maintaining a continuous or long-term action and that is being done so successfully	Sanctuary staff have not taken action towards the implementation of these activities
Resource Protection	5	2	7	1
Education & Outreach	4	1	14	0
Research	2	0	9	0
Operations	5	2	11	2
Management Plan Totals	16	5	41	3

Resource Protection Action Plan

Strategy	Activity	Implementation Status			
		Completed	Partially Completed	Ongoing	No Action
RP-1: Evaluate and assess a proposed expansion of the sanctuary to protect, manage, and interpret additional shipwrecks and other potential maritime heritage resources	Initiate a public process to consider the advisory council's recommendation to expand the sanctuary boundary	X			
	Develop an Environmental Impact Statement to meet requirements under the National Environmental Policy Act, if the analysis conducted in Activity 1.1 results in a recommendation to expand the boundary	X			
RP-2: Assess and evaluate recreational use of sanctuary resources	Monitor use of sanctuary resources by recreational users in order to better understand use patterns and the effects of use on the resources, and to better serve recreational users		X		
RP-3: Increase compliance with sanctuary regulations and other applicable state and federal laws	Ensure sufficient patrol presence in the sanctuary through partnerships and interagency coordination			X	
	Evaluate the use of technology to enhance enforcement efforts				X
	Use interpretive enforcement as a tool to inform users about sanctuary regulations			X	
RP-4: Increase and encourage access and responsible use of sanctuary resources by fostering greater awareness among recreational users	Provide practical information for users such as shipwreck locations and information, access points, regulations, and contact information			X	
	Maintain existing and install additional mooring buoys at shipwreck sites to protect shipwrecks from anchor damage and to facilitate shipwreck access			X	
	Reduce the impact of divers and snorkelers on Thunder Bay's maritime landscape by forming a partnership with commercial operators to educate their customers about maritime heritage resources, the sanctuary, and diving and snorkeling etiquette using a program similar to Florida Keys National Marine Sanctuary's Blue Star Program			X	
	Work with other agencies, local governments, and non-governmental organizations to improve recreational access along Lake Huron		X		
RP-5: Preserve and curate maritime heritage artifacts	Establish membership criteria and procedures for an accessions committee to evaluate donation criteria and artifact handling policies	X			
	Continue development of infrastructure for conservation laboratory and curation facilities for the long-term storage of artifacts	X		X	
	Make artifacts available to the public and to professionals via exhibits, loans, and selected access to the artifact collection	X		X	
Action Plan Sub-Total		5	2	7	1

Resource Protection Activities are COMPLETED	5
Resource Protection Activities are PARTIALLY COMPLETED	2
Resource Protection Activities are ONGOING	7
Resource Protection Activities have received NO ACTION	1

Education & Outreach Action Plan

Strategy	Activity	Implementation Status			
		Completed	Partially Completed	Ongoing	No Action
ED-1: Increase awareness and knowledge of the sanctuary by developing education and outreach materials for a	Develop education materials and lessons for students and educators Develop outreach materials for a wide variety of users			X X	
ED-2: Increase awareness and knowledge of the sanctuary through education and outreach programs	Expand education offerings for elementary, secondary, and higher education students and teachers, both at the GLMHC and throughout the state Provide opportunities for shipboard education in the sanctuary Bring Thunder Bay National Marine Sanctuary content to a national audience through distance learning Utilize remotely operated vehicles (ROV) and research technology in sanctuary education			X X X X	
ED-3: Enhance sanctuary communications to create greater awareness	Develop and implement a marketing plan to promote the sanctuary and the Great Lakes Maritime Heritage Center and Trail Enhance Thunder Bay's Web site to provide quality, up-to-date information about the sanctuary, including implementing Web 2.0 components (social networking, wikis, blogs, etc.) to encourage collaboration and interaction with the public Sponsor, organize, and participate in outreach opportunities that promote the sanctuary's mission and that allow for dissemination of sanctuary information	X X		X X	
ED-4: Maintain and expand Thunder Bay National Marine Sanctuary community presence	Continue to develop the Great Lakes Maritime Heritage Trail in Alcona, Alpena, and Presque Isle counties Provide way-finding and promotional signage for the sanctuary and the Great Lakes Maritime Heritage Center and Trail Conduct an assessment of the economic impact of the sanctuary	X	X	X X	
ED-5: Maximize the impact and effectiveness of education and outreach efforts, including interpretation at the Great Lakes Maritime Heritage Center and Trail, through ongoing evaluation	Create a standing working group of education experts from the sanctuary advisory council, local schools, and agencies to advise on sanctuary education and outreach programs Seek ongoing input, foster youth leadership, and encourage youth participation in sanctuary education and outreach programs through the "Sanctuary Stewards," a volunteer group comprised of local junior high, high school, and college students Develop and implement an ongoing system to evaluate and improve education and outreach programs	X		X X	
Action Plan Sub-Total		4	1	14	0

Resource Protection Activities are COMPLETED	4
Resource Protection Activities are PARTIALLY COMPLETED	1
Resource Protection Activities are ONGOING	14
Resource Protection Activities have received NO ACTION	0

Research Action Plan

Strategy	Activity	Implementation Status			
		Completed	Partially Completed	Ongoing	No Action
R-1: Characterize the sanctuary's maritime heritage resources and landscape features	Conduct historical and archival research on potential maritime heritage resources and landscape features in and around the sanctuary			X	
	Conduct systematic remote sensing and visual surveys to locate and identify maritime heritage resources and landscape features in the sanctuary			X	
	Prioritize archaeological documentation of identified maritime heritage resources to establish baseline data for long-term monitoring			X	
	Continue to develop the sanctuary's Geographical Information System (GIS) for archaeological, historical, and geographical data management and dissemination			X	
R-2: Develop a monitoring program for sanctuary maritime heritage sites	Develop and implement a long-term monitoring plan to determine the natural and human impacts on maritime heritage sites				
R-3: Continue partnership with Alpena County George N. Fletcher Public Library to manage the Thunder Bay Sanctuary Research Collection	Preserve the Thunder Bay Sanctuary Research Collection and continue to partner with the library to make it accessible to the public	X			
	Evaluate opportunities to increase Thunder Bay Sanctuary Research Collection holdings			X	
R-4: Develop partnerships with local, state, national, and international researchers and organizations to enhance sanctuary research programs	Develop partnerships to characterize the sanctuary's maritime heritage resources			X	
	Develop partnerships with multi-disciplinary researchers and organizations to study Great Lakes ecology including the study of climate change, invasive species, lake biology, geology, and water quality. Also, continue to develop marine observation infrastructure and capabilities to serve as an ONMS Sentinel Site			X	
	Create a standing research working group of multidisciplinary researchers from the sanctuary advisory council, government agencies, academic institutions, and non-governmental organizations to provide input to further develop and implement a comprehensive sanctuary research program			X	
R-5: Utilize volunteers, students, fellows, and interns for sanctuary characterization, research, and monitoring	Recruit, train, and retain volunteers to assist sanctuary staff on various research projects and with the Thunder Bay Sanctuary Research Collection			X	
	Establish partnerships with universities, colleges, and other institutions to establish a robust program for student research internships and fellowships	X			
Action Plan Sub-Total		2	0	9	0

Research Activities are COMPLETED	2
Research Activities are PARTIALLY COMPLETED	0
Research Activities are ONGOING	9
Research Activities have received NO ACTION	0

Operations Action Plan

Strategy	Activity	Implementation Status			
		Completed	Partially Completed	Ongoing	No Action
SO-1: Develop infrastructure to enhance and maintain the Great Lakes Maritime Heritage Center	Continue to develop facilities plans for Thunder Bay National Marine Sanctuary Continually strive to ensure that all sanctuary operations are conducted in an environmentally friendly manner as possible Continue to develop and update facilities operations manuals that include an organizational chart, staff position descriptions, Great Lakes Maritime Heritage Center operating and emergency procedures, and sanctuary office procedures		X	X	
SO-2: Develop infrastructure for research vessels and equipment and field operations	Continue to work with NOAA's Great Lakes Environmental Research Laboratory to safely and efficiently meet Thunder Bay research vessel and research equipment needs	X		X	
SO-3: Hire staff and utilize volunteers to support existing, new, or expanded sanctuary operations, resource protection, education and outreach, and research programs	Hire a full-time education and outreach specialist to assist with expanding education and outreach programs Hire a graphic/web designer to produce sanctuary outreach materials Hire a receptionist for the sanctuary office Hire a marine operations coordinator/captain to operate and maintain sanctuary research vessels Provide staff with opportunities and resources for professional development training Attract, train, utilize, recognize, and retain volunteers to support and enhance sanctuary programs	X	X	X	X
SO-4: Develop partnerships and identify outside funding to support sanctuary operations and resource protection, education and outreach, and research programs	Develop, evaluate, and prioritize a list of potential sanctuary partners and ensure proper coordination and communication with new and existing intra- and interagency partners Continue to partner with the National Marine Sanctuary Foundation and local organizations to enhance the sanctuary's ability to implement this management plan	X		X	
SO-5: Enhance operation of the Thunder Bay Sanctuary Advisory Council	Strengthen the structure of the advisory council by evaluating and amending the advisory council's charter when needed and developing strategies to enhance the council's participation and effectiveness Provide support, resources, and guidance to help the advisory council engage and educate the public about sanctuary management issues and ensure they are a respected voice in the community			X	
SO-6: Develop procedures to ensure safety for all staff and sanctuary visitors	Continue to partner with Alpena Regional Medical Center's Center for Wound Healing and Hyperbaric Medicine to ensure access to local hyperbaric treatment for dive accidents Develop and implement procedures to ensure the safety of staff and the public Improve marine safety by providing the public with accurate and up-to-date weather conditions	X		X	
Action Plan Sub-Total		5	2	11	2

Operations Activities are COMPLETED	5
Operations Activities are PARTIALLY COMPLETED	2
Operations Activities are ONGOING	11
Operations Activities have received NO ACTION	2