

**Managing Thunder Bay National Marine Sanctuary:
Analyzing Access to and Preservation of
Lake Huron's Underwater Heritage**

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Abstract

Heritage sites are vitally important and nonrenewable cultural resources. As such, they must be effectively managed so that recreational opportunities for the public can be developed and the protection of sites for future generations can be ensured. When deciding how to best manage heritage sites, cultural resource managers constantly grapple with this balancing act of providing access to heritage sites and ensuring the preservation of those sites. When heritage sites exist underwater, this challenge is compounded because heritage managers are more limited in their ability to provide access to and preserve underwater heritage sites. To help heritage managers mitigate the balancing act of access and preservation, heritage laws and policies advocate for access and preservation efforts to bolster one another, creating a “feedback loop” that can act as an effective management strategy. Little research, however, has been conducted that considers how the ideal interaction of access and preservation put forth by these laws and policies can be translated into practical management decisions for submerged cultural resources sites.

This research examined the decisions Thunder Bay National Marine Sanctuary made when planning how to manage its submerged cultural resources. Thunder Bay National Marine Sanctuary is an important sanctuary to study, because it currently manages a nationally significant collection of shipwrecks, and is on the cusp of an expansion that would drastically increase the sanctuary’s management challenges and opportunities. To determine how successfully the sanctuary intertwines its access and preservation efforts, this research analyzed two management plans, one from 1999 and one from 2009, compiled by the sanctuary. This research found that these management plans were an excellent example of how to incorporate practical management strategies for the “feedback” of access and preservation of underwater heritage. This research also identified areas for improvement in the sanctuary’s management strategies, and made suggestions as to the implementation of these improvements in consideration of the sanctuary’s future expansion.

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Introduction

Shipwrecks fascinate us. There is something hauntingly ethereal and evocative about a dilapidated vessel resting on the ocean floor. While high-profile wrecks like the *Titanic* can captivate the world for generations, any shipwreck discovery—regardless of historical or archaeological importance—is “guaranteed a feature” in a newspaper (Halsey 1996:33). But unlike other fascinating objects from antiquity, shipwrecks are not rare. UNESCO estimates that three million vessels are lost to the world’s oceans (Kingsley 2011:224), and it seems that everyone—from underwater archaeologists and maritime historians to divers and amateur shipwreck enthusiasts—is deeply invested in this rich maritime heritage (Green 2004).

In the last fifty years, underwater parks, trails, preserves, and sanctuaries have been established worldwide to protect shipwrecks (Hannahs 2003; Scott-Ireton 2007; Manders 2008). This trend parallels the increasing importance that federal governments and international bodies have placed on protecting the world’s heritage sites, on land and underwater (McGimsey III and Davis 1984; King 2011:412). Managing these heritage sites—also referred to as cultural resources—has developed into a field known as heritage management or cultural resource management. According to Thomas F. King, cultural resources are “all the aspects of the physical and supra-physical environment that human beings and their societies value” and cultural resource management can be defined as “actions undertaken [...] to identify and manage the ways in which change affects or may affect” these resources (2011a:2).

One of the most consistently challenging aspects of cultural resource management is balancing the public’s desire to access cultural resources and the resources’ need for protection and preservation (Hannahs 2003; Scott-Ireton 2007; Lipe 2009; Runyan 2011). Cultural resource managers consider many issues when making decisions about access to and preservation of

heritage. For example, should parts of a site be closed to visitors to better preserve those spaces? Is a site easily accessible to individuals with disabilities? Should reproductions or facsimiles be used in interpretive spaces, or does the public deserve to experience “the real thing”? And perhaps most importantly, how do limitations on financial support and personnel factor into cultural resource management?

Balancing access and preservation becomes more complex for cultural resources that exist underwater. Most often, only a fraction of the public—specifically, certified scuba divers—can directly access underwater sites. Furthermore, a myriad of factors (e.g., consistently shifting bottom features, the unpredictable presence of marine life, etc.) affect the underwater environment and make controlled preservation efforts difficult (Halsey 1996; Scott-Ireton 2007; Bowens 2009; Runyan 2011). Managers of submerged cultural resources anticipate many of these complications, and mitigation strategies are provided in management plans for underwater parks, trails, preserves, and sanctuaries. Management plans are important because these documents “identify immediate, mid-range, and long-term challenges and opportunities, and develop a course for the future” (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries [USDC, NOAA, ONMS] 2009:5).

This thesis analyzed the management plans of Thunder Bay National Marine Sanctuary, which is an underwater preserve located in northwestern Lake Huron that includes approximately 50 identified shipwrecks and is estimated to include upwards of 200 (USDC, NOAA, ONMS 2013). The state of Michigan founded the Thunder Bay Underwater Preserve in 1981 as the first in a series of 12 underwater preserves established throughout the state (USDC, NOAA, ONMS 2013). In 2000, the preserve was subsumed by the National Oceanic and Atmospheric

Administration (NOAA), becoming the first national marine sanctuary to “focus solely on a large collection of historic shipwrecks and other underwater cultural resources” (Vrana and Vander Stoep 2003:22).

My research evaluated Thunder Bay’s Final Environmental Impact Statement/Management Plan from 1999 and the Final Management Plan implemented in 2009 to examine the decision-making processes involved in balancing access to and preservation of the sanctuary’s submerged cultural heritage. This is important, as the sanctuary currently acts as a preserve and a site for archaeological and marine research, as well as a recreational and educational space for many publics, including school groups, experienced divers, and tourists (USDC, NOAA, ONMS 2013). Since Thunder Bay actively—and, as I argued, successfully—caters to many facets of the public, studying the sanctuary’s decisions for managing access and preservation efforts for these publics provides a model for other heritage managers who experience similar challenges.

I selected Thunder Bay as my case study for two reasons. First, Thunder Bay includes shipwrecks of an incredible historical, cultural, and archaeological value, as

[...] it is the range of vessel types located in the sanctuary 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. [USDC, NOAA, ONMS 2013]

Second, Thunder Bay is currently considering expanding the sanctuary. The 2009 Final Management Plan adopted a proposal that would increase the current boundaries (448 square miles) to 4,085 square miles and double the number of known shipwrecks in the preserve (USDC, NOAA, ONMS 2013h). Because Thunder Bay National Marine Sanctuary is on the cusp of a significant expansion, analyzing Thunder Bay’s management plans at this point in its development is an opportunity to examine how the sanctuary’s management decisions have changed in preparation for the proposed expansion. Furthermore, because the sanctuary manages

an impressive collection of shipwrecks worth preserving and creating access to, it is crucial to dissect how Thunder Bay National Marine Sanctuary addresses the challenges of managing underwater heritage, including the juxtaposed goals of access and preservation.

Managing Our Heritage

Cultural and natural resources are important to many groups for numerous reasons (Lipe 1984; Lipe 2009). For example, amateur and academic historians may value a building because of its important historic associations; Native American tribes may value a place because of its spiritual and ancestral connections; environmentalists may value a protected area because of the endangered flora and fauna it safeguards; or outdoor adventurers may value a challenging landscape they can enjoy exploring. Because of the many values diverse groups place on cultural and natural resources, federal heritage legislation and international policies have been developed to create legal and ethical boundaries for the management of heritage sites. These laws and policies influence and complicate decisions made by heritage managers in terms of creating access to and promoting preservation of heritage. Though a wealth of international, national, state, and local laws and policies affect heritage management, my research focused on the most fundamental, and discussed how these laws and policies incorporate and mandate access and preservation.

The United States began instituting heritage legislation in the early twentieth century, and most of the country's federal heritage laws encourage preservation and conservation, promote public access, or elements of both, and are structured around cultural and natural heritage (Figure 1) (McGimsey III and Davis 1984; Runyan 2011). The Antiquities Act of 1906—and the creation of the National Park Service in 1916 through the Organic Act—established precedent

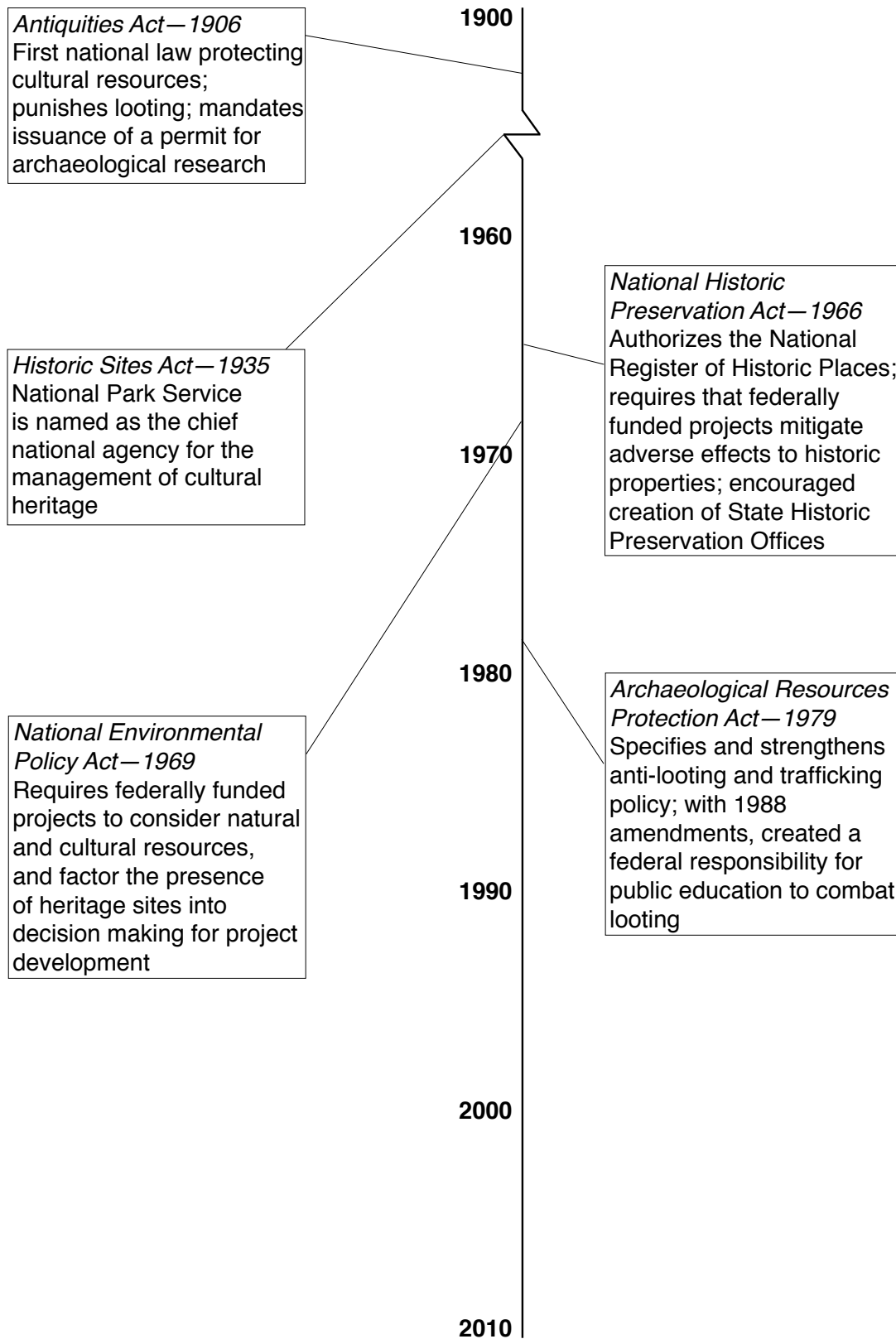


Figure 1. A Timeline of Selected U.S. Federal Heritage Legislation

for federal control of the nation's heritage and demonstrated a policy that focused on the preservation of heritage, with the 1906 Act introducing a permit system for excavation of public lands and specifying that all recovered materials should be safely housed in a museum (McGimsey III and Davis:118). It was not until the passage of the Historic Sites Act of 1935 that public access was legally considered part of national heritage policy. This act named the National Park Service (NPS) as the head federal agency for cultural heritage and declared "it to be national policy to preserve for (in contrast to simply protecting from) the public, historic and archaeological sites, buildings, and objects of significance" (McGimsey III and Davis:118). The Historic Sites Act was an outlier, however, as federal heritage legislation would not consider the public to be a vital aspect of cultural resources management policy again until the late 1980s.

The National Historic Preservation Act (NHPA), signed into law in 1966, is perhaps the most influential piece of federal heritage legislation (Runyan 2011:953). NHPA strengthened preservation practices for heritage sites by authorizing the National Register of Historic Places, the Advisory Council for Historic Preservation, and the establishment of State Historic Preservation Offices (Bergman and Doershuk 2003:85). These three systems work in tandem to nominate heritage sites for the National Register and to consider nominated sites for protection eligibility (Runyan 2011:954). NHPA also mandated that heritage sites be considered in project planning for federal agencies, including potentially halting projects that threatened the protection of heritage sites eligible for the National Register (Runyan 2011:953).

Additionally, NHPA authorized the Department of the Interior to create standards and guidelines for heritage preservation, restoration, rehabilitation, and reconstruction (McGimsey III and Davis 1984:120). The standards and guidelines are "intended to promote responsible preservation practices that help protect our Nation's irreplaceable cultural resources" (U.S.

Department of the Interior, National Park Service [USDI, NPS] 2001). While these standards and guidelines offer suggestions for the management of diverse heritage sites, in terms of archaeological heritage, the guidelines suggest these resources “be protected and preserved in place” (USDI, NPS 2001). The standards demonstrate preference for “in place” or *in situ* preservation as compared to *ex situ*, or removed preservation (both of which will be discussed below in more detail). A preference for *in situ* preservation for heritage management is echoed in subsequent legislation and international policies (Kinglsey 2011).

While federal legislation like NHPA clearly sanctions a preference for *in situ* preservation, NHPA and the National Environmental Protection Act (NEPA), passed in 1969 to address the protection of natural heritage landscapes (McGimsey III and Davis 1984:119), did not consider the importance of public access to heritage sites nor include any statutes dictating how the public should be considered in terms of heritage sites. The management imperative for public access did not re-enter the sphere of federal heritage policy until the 1988 amendments to the Archaeological Resources Protection Act (ARPA), which was passed in 1979 (McGimsey III and Davis 1984:120). The amendments attempted to combat looting of heritage sites through education, mandating that federal agencies develop formal and informal education programs about the dangers of looting and the benefits of protecting heritage (Little 2012:400). This is the first instance of federal heritage legislation that not only implied that the public is an important consideration for heritage management, but also has the potential to contribute to preservation efforts in managing the nation’s cultural resources.

This amendment and other international statutes that began surfacing in the 1970s and 1980s marked the rise of consideration of the public and its right to interact with, or access, its heritage. The United Nations Education, Scientific, and Cultural Organization (UNESCO) and a

professional organization, the International Council on Monuments and Sites (ICOMOS), have championed heritage management internationally since the 1950s and 1960s, respectively. Since then, UNESCO has been responsible for at least twenty hosted conventions, compiled recommendations, and declarations concerning heritage management, and ICOMOS has prepared about ten charters, documents, and declarations on the subject, a selection of which can be found in Figure 2 (King 2011:412-3). It is important to note that, unlike for heritage legislation, cultural resource managers are not legally obligated to implement any UNESCO statutes that the United States is not party to nor integrate any ICOMOS best practices into management strategies. Thus, ICOMOS and UNESCO recommendations represent ethical best practices for heritage managers, not legal necessities. This is a crucial distinction because, when funds are tight and hard decisions are made, best practices are often compromised while legally mandated policies are prioritized.

International charters and conventions typically discuss best practices for heritage preservation, public access to heritage, and, more recently, a combination of both. For example, the 1990 ICOMOS Charter on the Protection and Management of the Archaeological Heritage stated that

The overall objective of archaeological management should be the preservation of monuments and sites *in situ*, including proper long-term conservation and curation of all related records and collections [...] The presentation of the archaeological heritage to the public is an essential method of promoting an understanding of the origins and development of modern societies. At the same time it is the most important means of promoting an understanding of the need for its protection. [ICOMOS 1990: Article 6]

This message was echoed in the 2008 ICOMOS Charter for the Interpretation and Presentation of Cultural Heritage Sites, which stressed “the importance of public communication as an essential part of the larger conservation process” and asserted that “every act of heritage conservation—within all the world’s cultural traditions—is by its nature a communication act” (ICOMOS 2008:

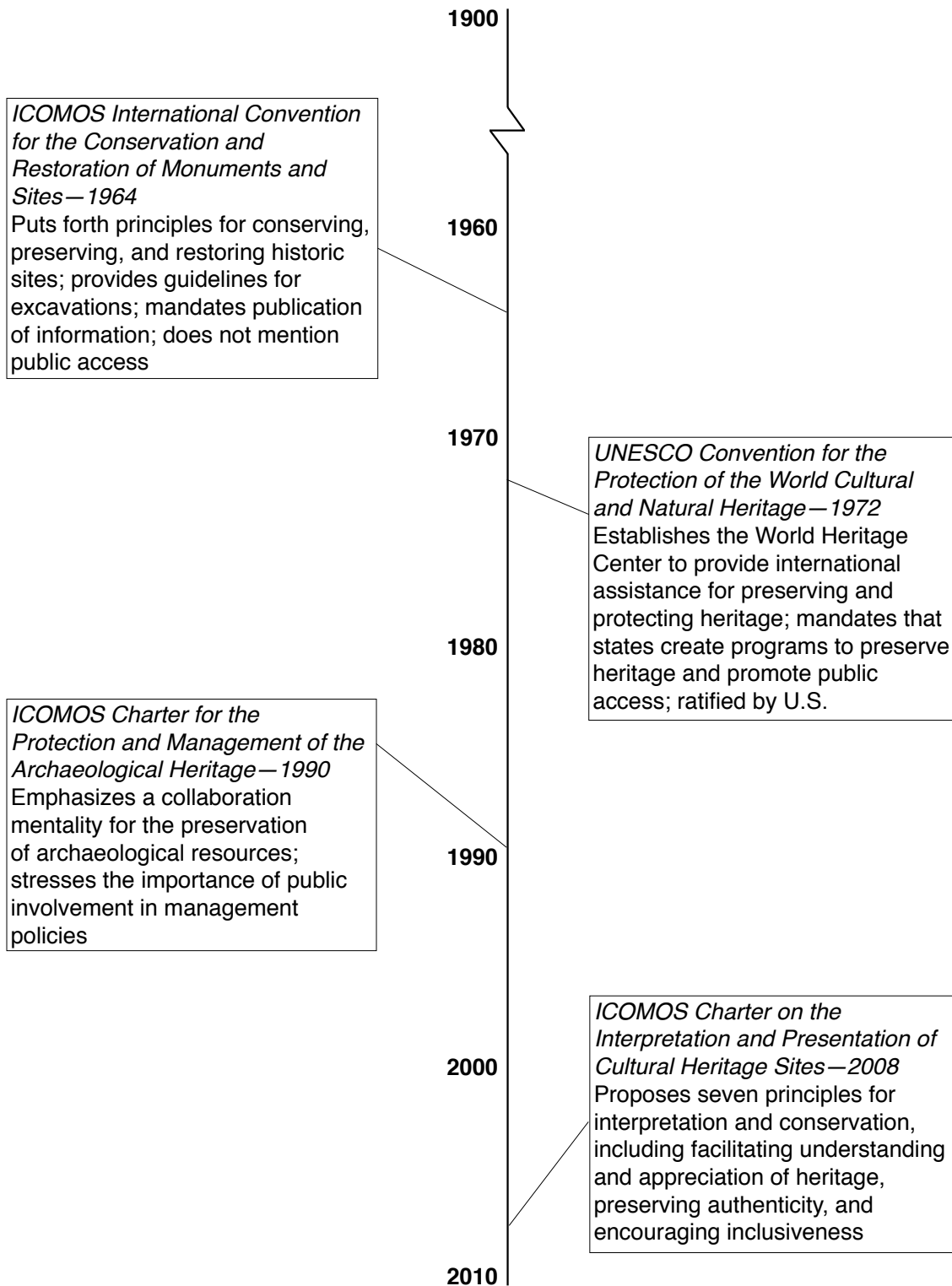


Figure 2. A Timeline of Selected International Heritage Conventions and Charters

Preamble). These declarations demonstrate that, in the realm of international sanctions, public access to and preservation of cultural resources are inescapably intertwined in management policy.

Issues in Preserving Heritage

Translating these international charters and conventions, federal laws and guidelines, and any state and/or local policies into effective management strategies can prove challenging for cultural resource managers. Heritage managers are usually responsible for a diverse array of resources to protect with no “one size fits all” policy to implement, and must negotiate complex ethical imperatives to preserve heritage sites both for the public and from certain members of the public, including looters, vandals, and, to some extent, avocational archaeologists. My discussion on preservation issues (and access issues, below) focused on archaeological heritage sites.

Archaeologists recognize that they are destroying the archaeological context of remains as they excavate, but that this is a necessary part of archaeological research and knowledge creation; “to dig is to destroy” is a well-used adage in archaeology (Ford 1984:133). But in the sense of heritage, this adage proves tricky, as archaeological sites are considered “non-renewable and irreplaceable” resources (Pace 2012:279). Cultural resource managers are responsible for mitigating adverse effects of archaeological research and other human interaction with heritage sites through preservation, which usually occurs *in situ*. For managers, this usually includes ensuring heritage sites are adequately protected, that up-to-date excavation procedures are being used (if selective excavation is occurring), and that there is ongoing care for any recovered artifacts (Ford 1984:134). This approach can become complex extremely quickly, because each heritage site is unique and thus has the possibility to present an unprecedented set of potential preservation predicaments. Even the Department of the Interior’s standards—the foremost

example of federal preservation policy—admit that the suggested standards are “neither technical nor prescriptive” and “they cannot, in and of themselves, be used to make essential decisions” (USDI, NPS 2001a). Based on this reality, each heritage manager must make preservation decisions on a site-by-site basis using professional and legal guidelines as best as they can manage.

But what if a heritage manager decides a site cannot remain preserved *in situ*? This can occur when it is “unrealistic or otherwise undesirable to keep the site in place,” and results in a management strategy known as *ex situ* preservation—or, removing artifacts from a heritage site in order to preserve them in a separate environment. This strategy can allow heritage to be more easily accessible by the public, but can negatively affect the preservation of an artifact or heritage site, as it can include recovering an abundance of artifacts, necessitating expensive, expansive, and time-consuming museum curating and storage (King 2011b:89-90). Conversely, *in situ* preservation usually allows for better preservation techniques, but can complicate the ability for public access to heritage sites. *In situ* and *ex situ* preservation, their corresponding relationship to public access, and the demands of federal and international sanctions complicate the decisions heritage managers face when managing cultural resources.

Beyond the technical challenges of preservation, heritage managers also must consider a convoluted construction of preservation ethics. One of the challenges associated with preservation ethics is that it is usually considered “totally indefensible and unethical not to protect prehistoric remains at any costs” (Gustafsson and Karlsson 2012:480), but the existing legal system does not allow for this, as it is structured analogously to the way medicine “preserves” life:

People obviously must die to make way for new people, so the purpose of medicine cannot be to preserve every life indefinitely. In the same way, cultural heritage law

cannot be designed to preserve every conceivable expression of cultural heritage forever. If a law requiring such preservation were ever enforced, it would be necessary for history to stop, because nothing could ever again be changed.

So the purpose of cultural heritage law [...] is to determine what constitutes cultural heritage—what it is we value for its cultural associations—and then to decide whether and how each identified element of that heritage can and should be preserved, given whatever conflicting public interests may exist [...] And then to effect that “preservation.” [King 2008:224]

Furthermore, in some respects, heritage preservation could be most effective if the public did not have access to heritage sites (Hannahs 2003). But, as recent federal law and international policy dictates, public access to cultural heritage is not only considered an legal necessity, but an ethical standard as well (ICOMOS 1990). It is thought that “ethics becomes not just a question of the preservation of authenticity but rather one of letting the public reflect on the site and create a meaningful connection to it” (Gustafsson and Karlsson 2012:481).

Ultimately, resource managers are told to preserve heritage “at any cost,” are not provided with the necessary legal framework to do so, and are then thrown the curveball of allowing the public to access heritage, which unavoidably leads to some degree of resource degradation. Perhaps in part to reduce this ethical dissonance, management policy has recently evolved to emphasize the potential power of public access and preservation goals complementing each other and creating a feedback loop (Figure 3). To illustrate, if the public can engage with heritage sites in a meaningful way, then they will want these sites to be preserved so they and/or future generations can continue having access to and learn from the places that are important to their heritage (Gustafsson and Karlsson 2012:491).

While this new conceptualization of heritage management policy and ethics is presented as existing harmoniously in the theoretical world, these goals are often difficult to implement (Gustafsson and Karlsson 2012:491). Looters, vandals, and avocational archaeologists are

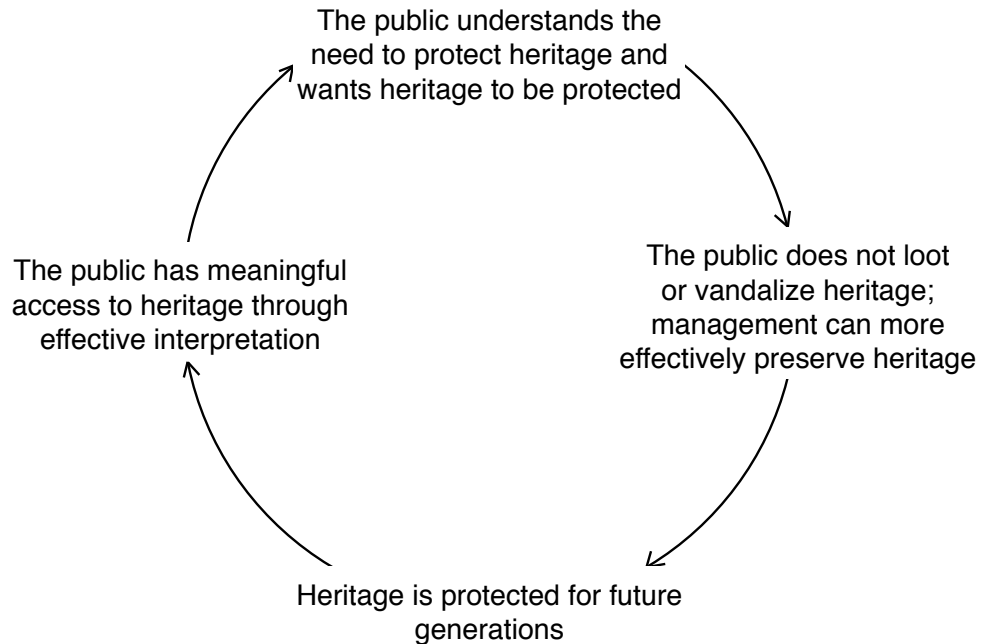


Figure 3. Feedback Loop of Access and Preservation in Heritage Management

collectively destroying and altering—sometimes legally, sometimes illegally—parts of our heritage, resulting in “massive, irreparable damage” to the archaeological potential of heritage sites (Frison 1984:187). Looting, vandalism, and artifact trafficking not only affect archaeologists, but also local communities, descendent communities, and the public as a whole, as once an artifact is removed from its archaeological context, much of its potential information is irrevocably lost (Little 2012:399). However, federal law is, for the most part, explicitly clear on the illegality and severity of looting: The Archaeological Resources Protection Act (ARPA) states that the punishment for looting a heritage site is a fine of \$10,000 or one year in jail for a first offense, and a fine of \$100,000 or five years in jail for a repeat offense (McGimsey III and Davis 1984:120). Heritage managers are responsible for enforcing these protective laws (which are implemented with varying degrees of efficacy based on available resources and personnel), and usually address them with public statements and programs about looting during visits to heritage sites (Little 2012:400). The issue becomes more complicated, however, with amateur or

avocational archaeologists, also called artifact collectors, who usually interact with the archaeological record within a legal context (i.e. on private property), but can still pose a potential threat to heritage sites not under a manager's direct control, yet included in their vague ethical mandate to protect.

Avocational archaeologists make up a substantial portion of the public, estimated to include upwards of 50,000 individuals, or more than ten times the amount of Society for American Archaeology members in 1984 (Frison 1984:185). Recently, some archaeologists have proposed distinguishing between avocational archaeologists and looters in management policy. One suggestion is to reach out to avocational archaeologists with public educational programs that address how these individuals can damage the archaeological record and suggest best practices to mitigate these effects, such as documenting collections (Labelle 2003:115,123).

Additionally, partnerships between avocational and professional archaeologists have been suggested. Professional archaeologists could benefit from avocational archaeologists' frequency of interaction with and vast knowledge of heritage sites. And avocational archaeologists who practice legally could be professionally encouraged to access heritage sites in a more responsible manner and, in turn, assist in preservation of these sites for their own future enjoyment (Labelle 2003:119). Though such suggestions may be controversial in the world of cultural resource management, using access to heritage sites as a preservation tactic is, once again, presented as a preferred solution for cultural resource managers trying to balance the ethical imperatives of preservation with the complicated realities of heritage management.

Issues in Creating Access to Heritage

Archaeology, especially in the United States, is a "public discipline." Unlike other fields, archaeological research is conducted in public spaces, thus increasing public exposure to

archaeology and fueling the public's interest in the past (Fagan 1984:176). However, archaeologists sometimes do not communicate effectively with the public, and the benefits and processes of archaeological research can be cryptic and confusing for the uninformed (Stuart 1993:250). This is problematic because informing the public about its collective past is considered an ethical necessity for the field of archaeology, and one that is often ignored (Jameson Jr. 2003; Jameson Jr. 2007:8; Lipe 2009:45; Little 2012:401).

Informing the public is usually subsumed into the responsibilities of cultural heritage managers, who attempt to bridge the divide between archaeologists and the public through the development and implementation of interpretation strategies at heritage sites. Interpretation programs usually promote direct access to the past (via sites and artifacts) in addition to indirect access, usually through media, recreations, or a variety of programs that can provide creative ways to interact with heritage themes, such as hands on activities or living history demonstrations (Lipe 2009:42,58). These interpretative programs can inform the public about the history of the site, the value of archaeology, and broader contemporary issues (Little 2012:403-5). However, heritage managers need to consider a variety of factors in creating interpretive programs, including

How much will the site have to be “fixed up” in order to accommodate tourists? How much should it be reconstructed? What sorts of facilities will be needed? How will all this be maintained? How can we ensure the accuracy of the interpretation? Will there be “winners” and “losers” in our interpretive scheme? [King 2011b:88-9]

King's last inquiry touches on one of the main challenges of managing public access to heritage sites: balancing the needs of a variety of public sub-groups, also known as stakeholders, which can include tourists, researchers, descendent communities, religious communities, commercial groups, and many others. Because each heritage site can have a range of potentially contradicting and overlapping values associated with it, cultural resource managers need to

understand “which values and sites are important to which stakeholder groups” and “how the interests of such groups in accessing various resource values can be met” (Lipe 2009:45). This is not an easy task, as contemporary managers sometimes need to consider a wide variety of stakeholders with which to establish community partnerships and maintain an informational and respectful dialogue (Jameson Jr. 2003:160; Jameson Jr. 2007:17; Little 2012:396).

In addition to sheer quantity of stakeholders, there is the potential for disagreements among stakeholder groups as to how resources should be managed (Boyd 2012:176,182; Lipe 2009:55). Heritage managers are responsible for navigating these conflicts and avoiding contentious escalations, while at the same time “encouraging and in some cases demanding that the stakeholder groups recognize the multiple values at play,” and stressing the importance of long-term protection for heritage resources to stakeholder groups who may desire access to the detriment of preservation (Lipe 2009:46). This can be a fine line for heritage managers to walk. And the stakes are high: Public stakeholders are a crucial element of heritage management, as they can either be a site’s most dedicated advocate or, if stakeholder groups are not addressed in management policy, a site’s biggest adversary (Jameson Jr. 2003:158).

Access to and interpretation of heritage sites, as discussed earlier, has the potential to connect to a site’s preservation and protection efforts, especially in terms of combating looting. It is not just access to a site that can prevent its destruction; it is the quality of the interpretive programs. Because the public is an essential partner in safeguarding heritage, public interpretation efforts are crucial, as they can promote the importance of stewardship for our shared heritage (Jameson Jr. 2007:12). Interpretation can also connect the importance of protecting sites to the importance of archaeological research (Little 2012:399). For example, museum exhibitions on conservation tactics for archaeological artifacts can provide visitors with

an inclusive, “behind-the-scenes” experience and in turn create an informed public that understands the ethical values applied to and the decisions made about heritage management and archaeological research (Brooks 2011). Furthermore, heritage managers have started to use the Internet to include more stakeholders in discussions about heritage protection, as creating a wider access to heritage can create more individuals who wish to safeguard it (Evens and Hauttekeete 2011; Kunda and Anderson-Wilk 2011).

Lipe asserts that “management is not a goal in and of itself but requires answering the question, ‘management for what ends?’” (2009:62). Heritage policy has developed in the United States to encourage management for the preservation of heritage, in addition to allowing public access to cultural resources. Oftentimes these two goals can coincide and fortify one another, but they can also complicate each other. Heritage management is important because it balances these objectives to tries to ensure that the public will continue to have meaningful access to the nation’s well-preserved cultural resources for years to come.

Complicating Heritage Management: Going Underwater

Submerged heritage sites add layers of complexity to the legislation, standards, guidelines, ethics, and best practices that have been developed over the course of a century for the management of terrestrial heritage sites. This is, in part, because underwater archaeology’s trajectory as a discipline has been limited by centuries of salvage law that legalized the recovery of items from shipwrecks. Additionally, the underwater factor creates many difficulties for the management of submerged cultural resources. My discussion of underwater heritage legislation, policies, and management issues focused on the creation of access and preservation of submerged cultural resources.

Contrary to terrestrial heritage, it has been legal for anyone to salvage—or recover—materials from the seabed for economic gain for centuries (Lenihan 1983:40; Bass 2003:58). Salvage legislation evolved to mitigate losses resulting from the potential perils of maritime transportation by creating incentives for the recovery of cargo from sunken vessels. These laws are not compatible with heritage management legislation, which aims to diminish comparable activities such as looting and artifact trafficking (Marrleveld 2011:928). And, when the laws collide or a “loophole” emerges, the result is legal confusion for the management of submerged cultural resources “completely alien to archaeology on land” (Maarleveld 2011:928). This confusion often emerges because the protection of submerged heritage is based on factors such as location, ownership of the seabed, and ownership of the resource (Zander and Varmer 1996:61).

This problem is exacerbated by the fact that, until relatively recently, the lines between salvage and underwater archaeology were blurry. While terrestrial archaeology evolved into a systematic, scientific field by the nineteenth century, underwater archaeology remained much more similar to salvage operations until the 1960s (Bass 2001:4-5; Muckelroy 1978:16-17). One reason for this disparity between terrestrial and underwater archaeology is obvious: the latter was dependent on specialized technology that did not exist during the nineteenth century (Kingsley 2011:225). The self-contained underwater breathing apparatus (SCUBA), glass facemask, and rubber foot fins were not invented until the late 1930s and early 1940s (Goggin 1960:348). Since then, the discipline of underwater archaeology has struggled to distance itself from salvage, a task made difficult by the omission of submerged cultural resources from heritage protection legislation until the 1970s, and a lingering undercurrent of conceptualizing the world’s seas, oceans, and waterways as predominately economic—not cultural—spaces.

The first federal law that explicitly protected submerged cultural resources in the United States, the National Marine Sanctuary Act (NMSA), was passed in 1972 (Figure 4). NMSA authorized the Secretary of Commerce, through the National Oceanic and Atmospheric Administration (NOAA), to “designate discrete marine areas, within 200 nautical miles of the coast, which are deemed to be of national importance” (Runyan 2011:954). Currently, 13 national sanctuaries and one marine national monument¹ have been created based on their “historical, cultural, archaeological, or paleontological significance,” amounting to 150,000 square miles of protected waters around Hawai’i, the Pacific and Atlantic coasts, the Gulf of Mexico, the Florida Keys, and the Great Lakes (Runyan 2011:954). Under NMSA, NOAA regulates and protects the underwater cultural heritage in national marine sanctuaries, in addition to managing public access to and preservation of submerged cultural resources (Runyan 2011:954).

While NMSA is considered a hallmark of submerged cultural resources management legislation, the act embodies the same limitations for underwater heritage that NHPA created for terrestrial heritage—if a site is not initially included in the legislation or is not eligible for inclusion on a protected list, it is not safeguarded. This situation is extremely perilous for underwater heritage sites because the world’s waters are still widely understood in terms of economic properties in international legislation. For example, the 1982 United Nations Convention on the Law of the Sea (UNCLOS), which remains the paramount international convention regarding the use of the world’s oceans, focuses on implementing economic policies without any clear considerations regarding underwater cultural heritage (Bowens 2009:45-6). One of the most important legacies of UNCLOS is the authorization for states to establish five maritime zones radiating from shore that each dictate different levels of involvement nations can

¹ For information about other National Marine Sanctuaries, visit sanctuaries.noaa.gov.

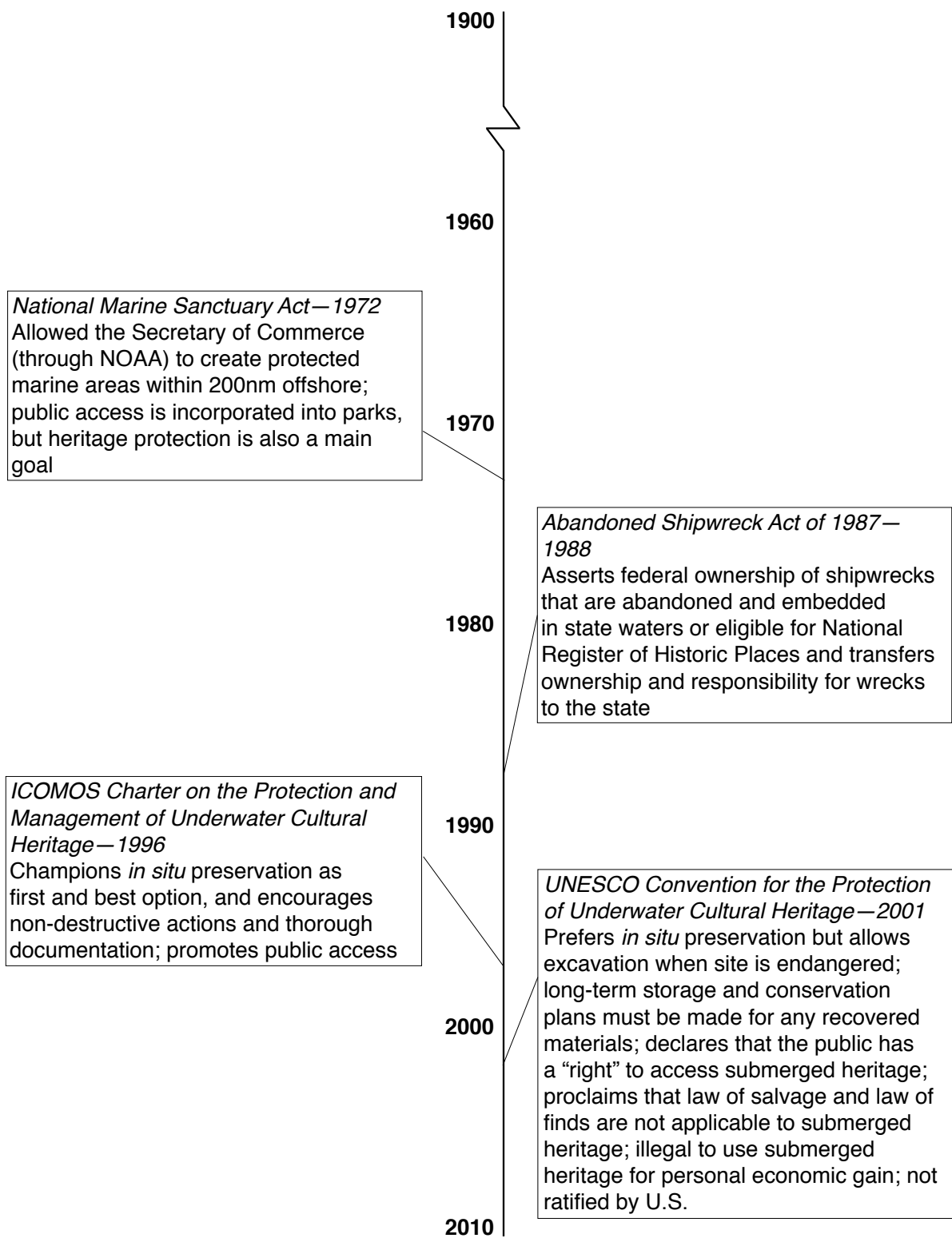


Figure 4. A Timeline of Selected U.S. Federal Submerged Heritage Legislation and International Submerged Heritage Conventions and Charters

have in, among other activities, protecting submerged cultural resources (Figure 5) (Bowens 2009:45-6). Each of these zones have their own rules for the protection of submerged cultural resources and, while the United States has not ratified UNCLOS, it did recognize the convention's authority in 1994, and thus its division of maritime zones and their associated legal properties (Runyan 2011:949).

This patchwork jurisdiction only adds to the legal confusion for submerged heritage and, perhaps in response to this, the United States passed its second piece of landmark legislation for submerged heritage five years after UNCLOS. The Abandoned Shipwreck Act of 1987 (ASA), which was signed into law in 1988, asserted federal title to any of the estimated 50,000 shipwrecks located in the nation's waters that are abandoned or deemed eligible for the National Register of Historic Places. The federal government then would transfer title of ownership to the state in which the shipwreck is located, and encourage states to "develop multiple-use management plans," based on the guidelines published by the NPS, that encourage access by a diversity of publics and preservation of underwater heritage (Runyan 2011:950).

The NPS guidelines were divided by the NPS into ten headings, and included explicit consideration of access to and—to some extent—preservation of submerged cultural resources (Table 1) (Croome 1992:40). These guidelines form the basis of submerged cultural resource management policy in the United States, and are intended to be implemented in management plans for preserves, parks, trails, and sanctuaries (USDI, NPS 1991). Though the NPS guidelines include seemingly clean-cut, overarching suggestions for access to and preservation of underwater sites, in reality, heritage managers must balance the needs of a diverse group of publics. These publics, including historic preservationists, archaeologists, divers, and salvors, do not always agree on how to interact with shipwrecks or how shipwrecks should or should not be

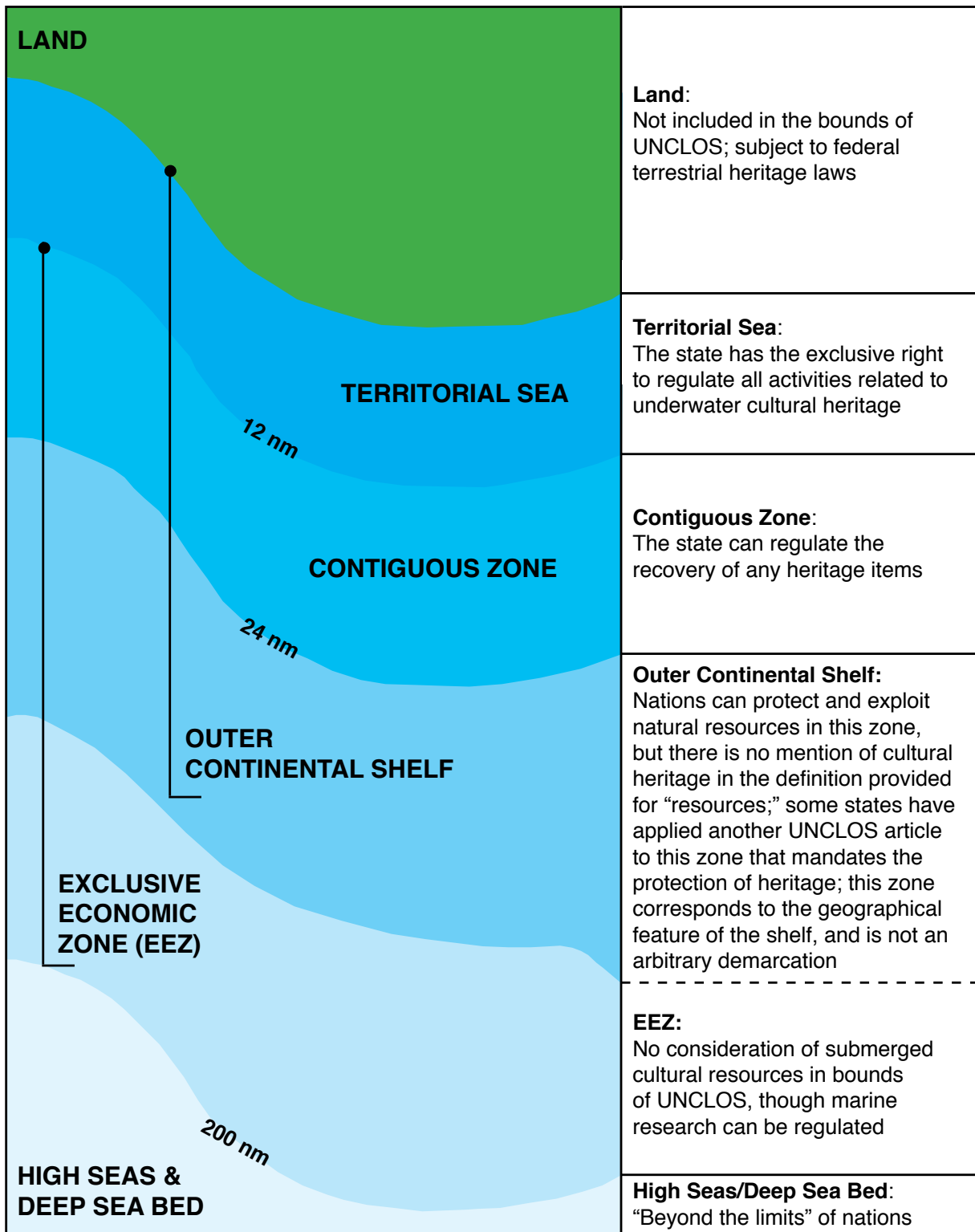


Figure 5. Submerged Heritage Protection Policy According to the Maritime Zones Determined by UNCLOS 1982.

Table 1. A Selection of the Abandoned Shipwreck Act (ASA) Guidelines as Compiled by the National Park Service

Providing Public Access to Shipwrecks	Interpreting Shipwreck Sites	Creating and Operating Underwater Parks or Preserves
Guarantee recreational exploration of publicly-owned shipwreck sites.	Present information on the vessel's history and the shipwreck's various values and uses.	Consult with the various interest groups.
Establish lists of shipwrecks having recreational value.	Disseminate information on shipwreck projects through publications, lectures, exhibits, and professional papers.	Prepare an environmental and economic impact assessment.
Facilitate public access to shipwrecks.	Build models of vessels.	Specify the unit's purpose, significance, boundaries, and any special conditions and constraints.
Consult with interest groups prior to imposing any restrictions on access.	Include interpretive materials in underwater parks and preserves.	Develop a general management plan.
Regulate access at few, if any, shipwrecks.	Encourage public and private interest groups to disseminate information on shipwreck activities.	Develop a resource management plan.
Provide adequate public notice of restrictions.	Require permittees, licensees, and contractors to disseminate information about recovery activities at historic shipwrecks.	Interpret and facilitate public access to shipwreck sites in underwater parks and preserves.
		Protect shipwreck sites located within underwater parks and preserves.

preserved. Thus, NPS guidelines reinforce the existing complications managers face in balancing access to and preservation of submerged cultural resources.

Because of complexities in international and national legislation and guidelines regarding the management of underwater heritage, there was a call in the 1990s for the development of “comprehensive legal protection of submerged cultural resources in both the national and

international arenas” (Zander and Varmer 1996:61). This urge was recognized internationally by the 1996 ICOMOS Charter on the Protection and Management of Underwater Cultural Heritage, which was the first international heritage policy that specifically focused on submerged cultural resources. The charter addressed many of the same issues as other international statements on heritage and directly led to the first UNESCO convention on submerged cultural resources (Runyan 2011:947).

Over 40 countries ratified the 2001 Convention for the Protection of Underwater Cultural Heritage (CPUCH) in 2009 (UNESCO 2013). This convention is considered “the most comprehensive legal instrument to protect UCH [underwater cultural heritage] beyond territorial waters” (Runyan 2011:947). CPUCH’s main principles include an emphasis on *in situ* preservation, allowance for excavation based on endangerment to the site, a mandate for the consideration of long-term conservation for any recovered materials, and a declaration that the public has a right to “enjoy the educational and recreational benefit of responsible, nonintrusive access” (Runyan 2011:949-9). CPUCH also dictated that international salvage law or law of finds would not be applicable to submerged cultural heritage, and especially that “underwater cultural heritage should not be traded, sold, bought or bartered as commercial goods” (Runyan 2011:949).

While CPUCH seemed like the answer to responsible management of the world’s submerged cultural resources, it fell short of its goal. Most devastatingly, CPUCH did not apply to any underwater heritage included in federal waters, and the world’s major maritime powers, including the United Kingdom, Russia, Australia, and the United States, refused to ratify CPUCH, citing its “failure to recognize sufficiently the rights of nations’ immunity over sovereign warships and the concern over political control of Economic Exclusion Zones”

(Kingsley 2011:230). Because of this holdout, submerged cultural resources in international waters remain a “Wild West” in terms of protective management and access policies (Kingsley 2011:232).

The last forty years have seen the emergence of federal and international policy for underwater heritage, and the initial shaping of how policy can dictate the access to and preservation of submerged cultural resources. The intricacies of underwater heritage legislation, which I briefly outlined, directly and deeply affect the management of submerged cultural resources, as many of these complications, contradictions, and complexities must be addressed in management plans for underwater heritage preserves, parks, trails, and sanctuaries. After all, “How can such an incomprehensible mass of fragile wood and artifacts of varying dates and forms, found by shareholders of the seas who often pursue deeply divided goals, be managed?” (Kingsley 2011:234).

Issues in Preserving Submerged Cultural Resources

Just as on land, underwater heritage managers must consider a wide array of factors when making decisions on how to best preserve submerged cultural resources. Preserving shipwrecks can be more challenging than protecting terrestrial heritage, as “shipwrecks are especially vulnerable because their continued preservation depends on maintaining the equilibrium that is established overtime between wrecks and their environment” (Scott-Ireton 2007:26). This equilibrium could be easily affected by pervasive environmental factors, such as pollution or an invasive species; human factors, such as maritime industry traffic or impacts of recreation; and the dynamic, nebulous nature of oceans, seas, and other waterways (Oxley 2001:414). Because of the difficulty in preserving underwater heritage, there are opposing opinions on how best to preserve it. Similar to terrestrial heritage management, the main debate that has emerged in terms

of underwater heritage preservation has been *in situ* versus *ex situ* management tactics, and the opportunities and challenges each approach provides.

According to ICOMOS and UNESCO, preservation *in situ* is usually considered to be the first and best option for shipwrecks (Manders 2008:39). This preference exists because shipwrecks are usually excellently preserved underwater (Zamora 2009:20), and it is difficult and expensive to recover and preserve shipwrecks in synthetic environments (Kingsley 2011:226). Since the 1960s, a variety of *in situ* preservation techniques have developed for many different types of vessels (Goggin 1960:353). The Nautical Archaeology Society recently published a handbook that presents detailed suggestions as to how underwater heritage should be monitored for changes and how to best protect different types of shipwrecks (Bowens 2009:164-8). Recommendations for monitoring shipwrecks include regularly tracking factors such as water temperature and salinity, seabed composition, water movements, and the presence of marine life (Bowens 2009:164). If monitoring a site reveals that preservation efforts may be necessary, NAS suggests a range of strategies each with associated pros, cons, and costs, such as re-burial of the site or the use of stabilizing sandbags, geotextiles (a sophisticated protective fabric), or anodes, which can slow the deterioration of metal objects (Bowens 2009:167-8). However, NAS admits that sometimes *in situ* preservation can not work for shipwrecks, especially those that are heavily trafficked or in a recently polluted environment, so managers need to prepare for this possibility in site management plans (Bowens 2009:168). Furthermore, it is important for managers to balance the costs of preservation, the effectiveness of protective measures, and the importance of the heritage site when making preservation decisions (Manders 2008:34).

Though *in situ* preservation is often preferred, and there are effective guidelines established for managers, there are still negative aspects to the strategy. Some submerged cultural resources

are becoming more vulnerable because of growing technological advancements that allow access to underwater heritage sites previously thought to be too deep (Zamora 2009:19). Because of this increase in accessible shipwrecks, thousands more underwater archaeologists would be needed to investigate the number of newly discovered shipwrecks reported yearly (Manders 2008:33). However, the underwater archaeology community is small and usually underfunded, while commercial salvage operations and treasure hunters are more numerous and well supplied. Thus, the latter groups usually can access sites left *in situ* that are unprotected by national or international maritime legislation.

Just like terrestrial sites, treasure hunting can be destructive to underwater heritage sites. Sometimes looters can be even *more* destructive to underwater sites with the usage of special equipment like prop washers or “mail boxes” that some treasure hunters use, which can destroy an entire shipwreck (Gould 1983:41). Prop washers attach to a vessel and direct the propellers’ power to the seabed, destroying or dissipating all remains that are not heavy enough to withstand the powerful current. This leaves metal objects of high value, such as gold or antique cannons, easily accessible. While prop washers allow treasure hunters to discover valuable artifacts, they can completely erase any traces of old, fragile wooden vessels. Furthermore, while commercial archaeologists in many countries cannot sell artifacts from terrestrial sites and share the profit with the government, such activities are common for underwater cultural heritage sites (Zamora 2009:28). Underwater heritage managers must take these threats into account when making decisions on how to best preserve shipwrecks and other heritage sites *in situ*.

Another major problem with preserving shipwrecks *in situ* is, similar to terrestrial heritage management, creating access to heritage is considered an integral strategy for the preservation of heritage. But public access to heritage sites is much more difficult in an underwater environment

(Manders 2008:39). Managers need to consider this when making decisions about protecting underwater heritage sites *in situ*, as the major dichotomy of choices is bringing the public to the shipwrecks or bringing the shipwrecks to the public (Manders 2008:35). This latter option is considered *ex situ* preservation. Though *ex situ* preservation is no longer the recommended option for the preservation of shipwrecks, it was a popular technique in the 1960s and 1970s for recovered underwater artifacts (McCarthy 2011:1045) or, sometimes, entire shipwrecks (Kingsley 2011:226). The merits of *ex situ* preservation are debated, with some individuals asserting that “the marine environment is far more dynamic than on land, so long-term preservation may only be achievable through recovery and active conservation,” (Kingsley 2011:231), and other arguing that it is “impossible to stop the deterioration of underwater archaeological sites altogether” regardless if they are *in situ* or *ex situ* (Manders 2008:32).

Whether or not *ex situ* preservation is ultimately a more effective preservation technique for underwater heritage, the debate is usually tied to a discussion of how *ex situ* preservation allows more members of the public to interact with shipwrecks remains than *in situ* preservation:

Some see the time taken in conservation as negative, pointing to the ongoing costs and the resources required as prohibitive and good reason not to recover submerged objects. [...] Research and other benefits aside, from a public perspective conserving, stabilizing, studying, and exhibiting those relics in a public environment is the stuff of a living museum of maritime archaeology. [McCarthy 2011:1045]

This opinion is mirrored in the recent Project Aquarius experiment, which monitored “waterlogged historical wooden materials” in an aquarium for three years to ascertain the possibility of simultaneously conserving and exhibiting portions of wooden shipwreck for the public (Björddal, et al. 2007:1169). The results of this experiment determined that using an anoxic aquarium with room temperature water or a low-molecular polyethylene glycol solution with filter systems allowed for the “possibility of combining conservation, storage, and display in one

process” for wood that does not include any iron items, such as nails or fasteners (Björdal, et al. 2007:1169). However, the authors acknowledge that these findings were only based on three years of observation and “continued long term studies are recommended” (Björdal, et al. 2007:1169).

Ultimately, managers of underwater heritage need to consider all the benefits and challenges of using *in situ* and *ex situ* preservation strategies, as they have a duty to “preserve a representative part of underwater cultural heritage for future enjoyment and research” (Manders 2008:32). This is especially important in the underwater realm because it is still legal for commercial salvors and treasure hunters to loot shipwrecks under the protection of national and international law. Managers need to make decisions that can protect submerged cultural resources in the short term and long term, while also ensuring that the public can continue to access shipwrecks and other underwater heritage sites (Green 2004:39). These decisions start with the management plans compiled for underwater preserves, parks, trails, and sanctuaries.

Issues in Creating Access to Submerged Cultural Resources

One of the most persistent challenges of managing underwater cultural heritage is the acknowledged need, like in the management of terrestrial site, to balance the access of different stakeholder groups with the preservation of cultural resources (Scott-Ireton 2007:19; Manders 2008:32; Runyan 2011:957). An added difficulty, however, lies in the fact that, unlike terrestrial heritage, a majority of the public cannot access shipwrecks and other submerged cultural resources (Watts and Knoerl 2007:224). Managers of underwater heritage sites thus need to create ways to include the diving community and also “communicate to the 99 percent of the population that doesn’t dive that these are their wrecks too” (Halsey 1996:33).

This problem is further compounded by the fact that the public is comprised of many

different stakeholder groups with diverging opinions on what types of access they desire. These stakeholder groups can include the general non-diving public (school groups, tourists, etc.), the recreational diving public, the local diving public, commercial dive charters and tourist operations, other commercial groups, the government, archaeologists and other researchers, and non-government organizations (NGOs) (Green 2004:376-80). Since the 1960s, managers of underwater heritage have been trying to balance the needs of these groups by providing avenues through which they can directly and indirectly access shipwrecks, while also limiting the negative effects these groups might have on the preservation of submerged cultural resources (Green 2004:380-9; Kingsley 2011:232).

Some common ways managers have addressed this issue include creating museum exhibitions, land-based wreck trails, underwater wreck trails, and shipwreck databases, while also publishing information and working with dive charters, and including archaeologists and other underwater researchers in management decisions (Green 2004:180-9). Some managers have been able to use additional financial resources to expand on these general strategies, and have encouraged snorkeling, glass-bottomed boat tours, submersible tours, and remotely operated vehicle (ROV) tours, built replica vessels for museum exhibition, and developed GPS applications for cell phones that provide information on nearby shipwrecks (Manders 2008:36; Cohn and Dennis 2011:1075; Runyan 2011:957).

Some managers have been able to be even more creative. For example, diving helmet displays are being developed that project historical reconstructions of shipwrecks for divers to use while exploring sunken vessels (Manders 2008:36); some museums are experimenting with the possibility of including an entire un-excavated ship in an exhibition, so visitors can “experience the excitement of archaeological research and underwater excavation” firsthand

(Manders 2008:37); and a combination of direct and indirect access is being developed for a museum in Alexandria, Egypt that plans to consist of submerged and terrestrial exhibition spaces (Manders 2008:37). These more elaborate ideas—like all management strategies—are directly tied to funding for submerged heritage management, which is often subject to severe budget cuts and sometimes a perpetual lack of funding. Managers of submerged cultural resources must consider these very real limitations when making decisions on how best to allow public access to shipwrecks.

However managers for submerged cultural heritage are able to create modes of access, any successful underwater preserve, park, trail, or sanctuary should include community involvement, effective interpretation, and active management, with success being defined as the

resource is visited consistently by the public who are educated as well as entertained, and that the resource is maintained in a manner consistent with sustainable use (both public and scientific) and long-term preservation. [Scott-Ireton 2007:21]

Community involvement, effective interpretation, and active management are interrelated. If there is effective interpretation, then the community will be more interested in becoming involved with management. And, if the community is involved, the management will be more effective, especially in terms of preservation, and thus able to develop more interpretation programs for the community to enjoy and benefit from (Scott-Ireton 2007:22-4). This management strategy reflects the feedback loop of heritage management dictated by heritage management legislation and policy (Figure 3).

But what about the diving public? Traditionally, the diving public and managers of underwater heritage have not had a mutually beneficial relationship, with many divers vocalizing their perceived right to dive on any wreck at any time, and calling managers of submerged cultural resources “bureaucratic vampires who should be buried so deep that [they] burn in h---,

forever” (Halsey 1996:29). This is particularly problematic for Thunder Bay National Marine Sanctuary because it is estimated that there are more than 100,000 certified divers in the Great Lakes region (Halsey 1996:32). Underwater heritage managers have recently been attempting to reach out to this stakeholder group, and turn them from stakeholders to shareholders.

One way managers have been engaging the diving public is by creating more educational and entertaining underwater shipwreck trails and underwater interpretation sites (Manders 2008: 35), because “an interested and excited diver is ripe for education efforts” (Scott-Ireton 2007:26). Some managers have added aesthetically interesting elements, such as anchors, windlasses, and cannons to make underwater heritage sites “more exciting and visually appealing” (Scott-Ireton 2007:26). However, this idea is accompanied by its own set of management dilemmas, as adding inauthentic elements to heritage sites can misrepresent the site and complicate interpretation efforts. Managers must ask themselves, “to what extent is dramatizing a shipwreck ethically acceptable?” even if it is for heritage stakeholders (Scott-Ireton 2007:26).

While these efforts have helped bridge the gap between the management and diving communities, there is room for improvement, and managers need to be able to address these concerns in management plans. For example, in 2002, a study was conducted of avocational divers who were known to actively search for and discover shipwrecks in the Great Lakes region (Vander Stoep et al. 2002). Though the number of identified shipwreck discoverers in the study is small, this group is similar to terrestrial avocational archaeologists in that they have immense knowledge of Great Lakes shipwrecks and could be potential partners in monitoring and protecting shipwrecks in and around the Michigan preserve system.

However, the answers divers provided to the study’s questions revealed some general misgivings about working with underwater heritage managers. For example, while 19 shipwreck

discoverers in the study said they would be willing to help the state of Michigan and heritage managers “document, assess and/or monitor” new-found shipwrecks, three participants did not respond to the question, two said “no,” and one diver emphasized “As a contractor (PAID), whatever is required. To volunteer my services without compensation, NOTHING.” (Vander Stoep et al. 2002:132-3). Based on a similar range of responses to the majority of questions, the study concluded with tentative hope for the future of manager/diver relations:

Yes, relationships still must be built; respect must be earned and given. But the diversity of opinion and willingness of some to try public/private partnerships provides an opportunity to begin to build those relationships. [Vander Stoep et al. 2002:134]

Because of the complications involved in managing access to shipwrecks and balancing the requests of diverse stakeholder groups while also preserving underwater heritage, the separation of submerged cultural resources into two management categories has been suggested: parks for public access, and preserves/sanctuaries for archaeological research and preservation (Hannahs 2003:14-5). The rationale for this proposal is “the goals of preserving archaeological sites intact and encouraging public access are not only not compatible, they are, in many ways, contradictory” (Hannahs 2003:6). Under this model, at least in theory, the public can still access the benefits of submerged cultural resources, and managers can protect shipwrecks without having to consider competing interests (Hannahs 2003:8-9). However, in reality, this recommendation is problematic. The most archaeologically interesting or important heritage sites—i.e. the sites that are most likely to be preserved—are the sites the public wants to access (Hannahs 2003:9), and it is not easy to find sites “that have low value to archaeologists and high value to the public” (Hannahs 2003:11).

Furthermore, this conceptualization of “parks versus preserves” disregards the value of integrating access and preservation as two compatible goals, which is hailed by most recent

legislation and international policies as the best option for underwater heritage management. Additionally, this model does not solve any problems; it simply avoids thinking about the existing challenges of managing underwater heritage and creates new ones. For example, if the public cannot access some sites undergoing archaeological research or judged too important to be disturbed, should these sites be supported and preserved with public funds? And what is the purpose of preserving sites that no one is going to be able to learn from or enjoy, except a small portion of the academic community? If some underwater heritage managers deem communicating the importance of preservation impossible, it is most likely because the proper channels for this information have not yet been utilized (Manders 2008:40).

The solution for balancing access and preservation for shipwreck management is elusive: like terrestrial heritage management, there is no easy checklist to follow for preservation and no clear path for allowing access to a range of stakeholders. Yet the responsibility for “deciding the best use of the resources generally falls to the resource manager who must weigh the benefits of public education with possible damage to the site and the information it holds” (Scott-Ireton 2007:26). This is where management plans come in. Management plans translate laws and policies into attainable goals, strategies, and activities that attempt to mitigate some of the tensions created by the sometimes incompatible desires of a diversity of stakeholders, while balancing access to and preservation of submerged cultural resources in underwater preserves, parks, trails, and sanctuaries.

Thunder Bay National Marine Sanctuary: A Case Study

Maritime culture has shaped the state of Michigan since prehistoric times. Archaeologists have discovered the remains of dugout and birch bark canoes and posit that, due to changing lake

levels from 8,000 to 5,000 years ago, many prehistoric cultural sites may be preserved underwater. Archaeological evidence suggests that ancient peoples lived near the lakeshore and interacted with and reacted to their maritime environment for the last 12,000 years (Halsey 1990:9-11; Pott 1999:359). This relationship with the Great Lakes continued with the influx of European cultures to the area. During the last two-thirds of the nineteenth century, especially, “sailors, fisherman, and shipwrights were as much a part of Michigan’s social fabric as the farmer, miner, and lumberman” (Pott 1999:360). The lighthouses, lifesaving stations, harbors and canals that were built, and the fishing and shipping industry that blossomed during this time continue to impact the lives of Michiganders today. From prehistory to contemporary times, Native American tribes, settlers, and citizens of Michigan have developed maritime infrastructure and interacted with the Great Lakes (Halsey 1990:13-9; Pott 1999:360). Michigan’s underwater preserves and Thunder Bay National Marine Sanctuary are important because they preserve and create access to the remnants of the state’s rich maritime history. By managing submerged cultural resources, Thunder Bay allows the people of Michigan to interact with and learn about their history.

Development of Thunder Bay National Marine Sanctuary

Shipwrecks are an unavoidable outcome of water-based travel, commerce, and recreation, and have become objects of fascination in maritime societies, with many different stakeholders expressing interest in their discovery, protection, and recreational use. Ten thousand shipwrecks are estimated to rest in the Great Lakes, 1,000 to 1,400 of which are embedded in the over 38,000 square miles of Michigan state bottomlands. These wrecks are now under the direct ownership and protection of the state of Michigan (Halsey 1990:29; Vander Stoep et al. 2002:126). This ownership commenced when the state of Michigan received title to the Great

Lakes and its bottomlands, or lake bottom, upon the area's inclusion in the Northwest Territory and the state's admittance into the United States in 1837 (Halsey 1990:29). Since then, Michigan has passed a series of public acts that have further defined the state's relationship with the bottomlands and their embedded submerged cultural resources, including shipwrecks (Halsey 1990; Halsey 1996; Pott 1999).

Perhaps the most important of these acts, in terms of underwater cultural heritage, is Michigan Public Act 184 that was passed in October of 1980 and gave "the state clear authority to manage all resources of historical value found on its bottomlands" (Pott 1999:363). Public Act 184 authorized the Department of State and the Department of Natural Resources to establish underwater preserves and regulate the removal of artifacts from underwater sites (Halsey 1990:29; Pott 1999:363). The act also stipulated that the goal of these preserves was to create a sanctuary for shipwrecks and a spot for recreational usage, specifically diving (Pott 1999:363). Subsequent public acts, such as Public Act 452 of 1988 and Public Act 451 of 1994 strengthened the state's position on protecting submerged cultural resources. Public Act 452 echoed the statutes put forth by the Abandoned Shipwreck Act of 1987 (Halsey 1996:28) and Public Act 451 consolidated rules for resource allocation, permits, and establishment procedures for the creation and management of underwater preserves (Act 451: Part 761).

Thunder Bay Underwater Preserve, established in 1981, was the first authorized underwater preserve in the Michigan preserve system. In 2000, after a series of assessments, inventories, public hearings, and informational sessions, Thunder Bay Underwater Preserve was successfully nominated and designated as a national marine sanctuary (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of Ocean and Coastal Resource Management [USDC, NOAA, OOCR] 1999). Thunder Bay was not only nominated

for its “nationally significant” assemblage of shipwrecks (USDC, NOAA, ONMS 2013), but also for the rich maritime history of the surrounding area, including

Native American inland shore fishery, water-based transportation, fur trade, European settlement, lighthouses and life-saving stations, commercial fisheries, water-based lumbering, shore land mining, shipping and coastal trade, shipwreck salvage, coastal community development, and present-day maritime recreation. [Vrana and Vander Stoep 2003:24]

The sanctuary is jointly managed by the state of Michigan and federal organizations, and its official designation is the Thunder Bay National Marine Sanctuary and Underwater Preserve, though it is also known as Thunder Bay National Marine Sanctuary (USDC, NOAA, ONMS 2009:3).

It was during this time that the 1999 Final Environmental Impact Statement/Management Plan was produced, proposed, and adopted. As defined in the 1999 plan, the management plan was

[...] a five-year plan describing management (operations and underwater cultural resource protection), education, and research programs for the Thunder Bay NMS [National Marine Sanctuary]. [...] The MP [Management Plan] is based on sound practices for comprehensively managing and protecting underwater cultural resources, and for promoting awareness and understanding of Great Lakes maritime heritage. [USDC, NOAA, OOCR 1999:30]

The 1999 management plan included information on the history and significance of the area that would be protected by the sanctuary. The plan also suggested multiple alternatives to the preexisting Thunder Bay Underwater Preserve, and explored the impacts and consequences of those alternatives, if implemented, such as different combinations of boundaries, regulations, and administration policies for the potential Thunder Bay National Marine Sanctuary (USDC, NOAA, OOCR 1999). The 1999 management plan (and the 2009 management plan) went through extensive public revision processes before being published and implemented in their final form.

With the guidance of the 1999 management plan, Thunder Bay National Marine Sanctuary has developed into a multi-faceted preserve with many opportunities for stakeholders to interact with submerged cultural resources on land, underwater, and virtually, in addition to providing opportunities for the research and the protection of submerged cultural resources. The adoption of the 1999 management plan established, in addition to these programs and policies, the current boundaries of Thunder Bay National Marine Sanctuary (Figure 6). In 2006, the sanctuary's management plan was reviewed and a new management plan was crafted, proposed, and adopted in 2009. The 2009 Final Management Plan provided much less extensive information on the sanctuary and surrounding areas than the 1999 plan, but followed the same general format, suggesting goals, strategies, and activities to implement in the future (USDC, NOAA, ONMS 2009). Since the many public committees and working groups involved in the 2009 management plan creation process decided that "many of the activities in the original management plan have been accomplished" (USDC, NOAA, ONMS 2009:6), the 2009 plan's centerpiece was a new challenge: a proposed expansion of the sanctuary (USDC, NOAA, ONMS 2009:9).

The adopted proposal would increase the sanctuary's area from 448 square miles to 4,085 square miles (or about 10% of Michigan's protected bottomlands), and this increased area would include twice as many known wrecks (Figure 7). Implementation of the proposed expansion will have extensive implications for the management of Thunder Bay National Marine Sanctuary, and steps to execute the proposal were included in the management plan (USDC, NOAA, ONMS 2009:11-2). The proposed expansion would drastically change the scope and presence of Thunder Bay National Marine Sanctuary, in addition to its future potential to preserve and provide access to submerged cultural resources. The expansion will be a major consideration in my analysis of Thunder Bay's management plans, as the plans contextualize the management

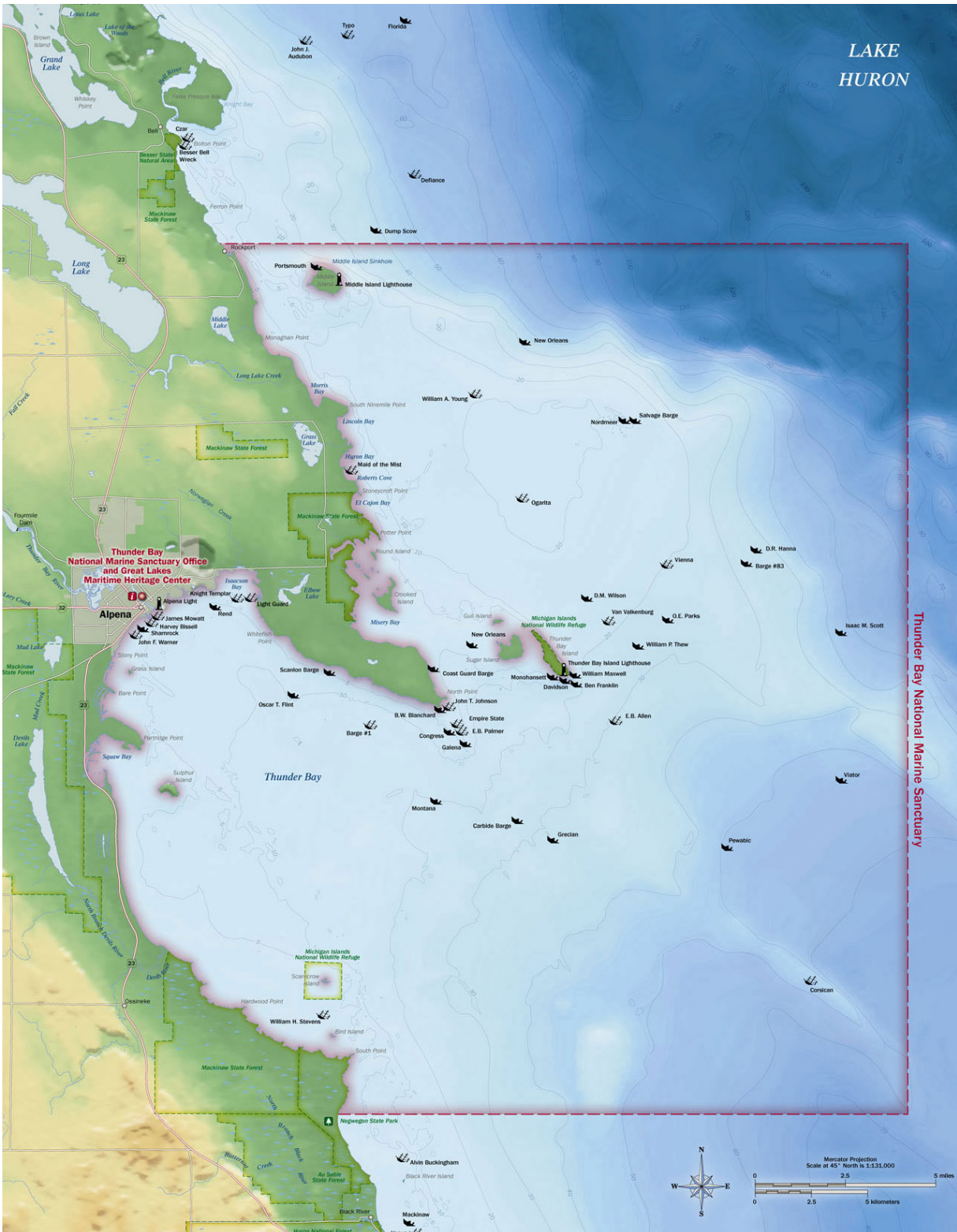


Figure 6. Map of Thunder Bay National Marine Sanctuary
 (USDC, NOAA, ONMS 2013g)

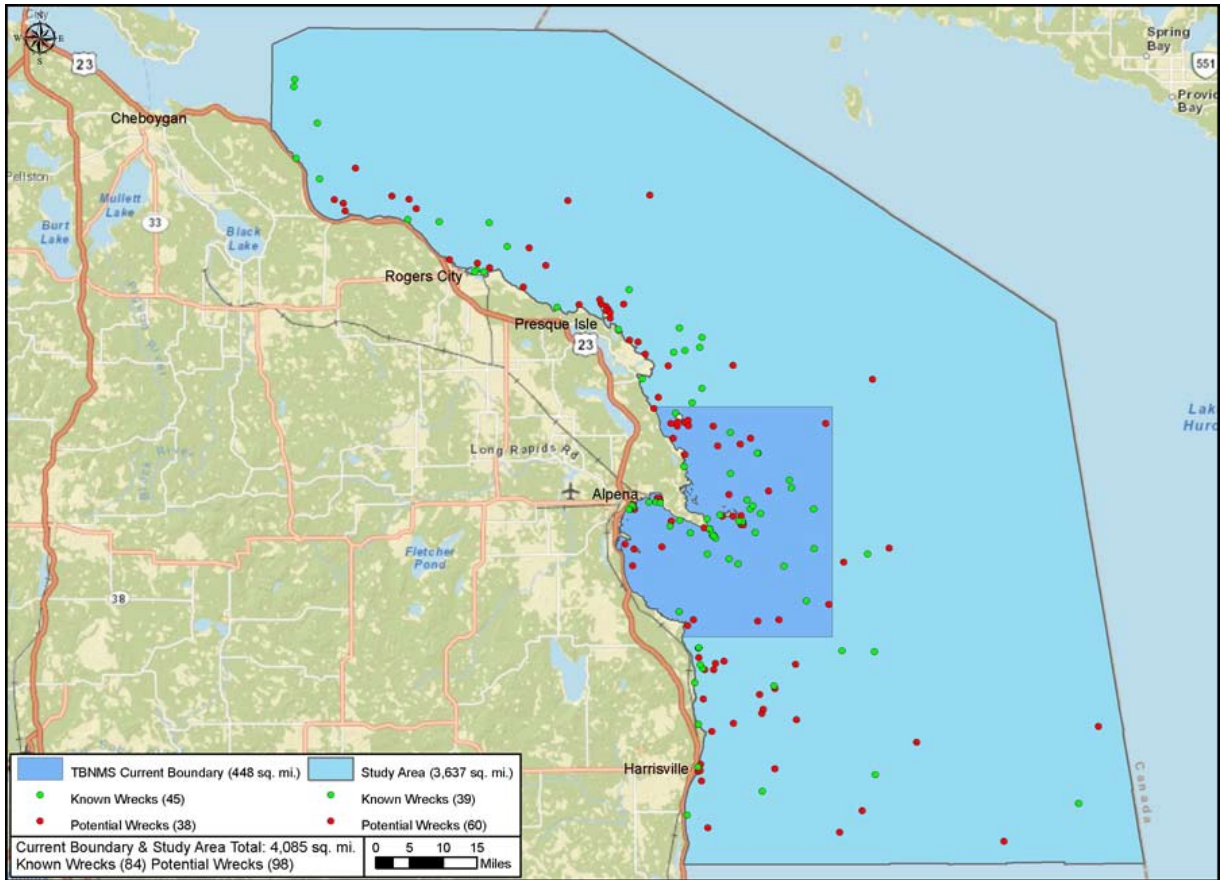


Figure 7. Map of Thunder Bay National Marine Sanctuary's Proposed Boundaries
 (USDC, NOAA, ONMS 2013h)

decisions Thunder Bay has made in terms of the sanctuary's future.

Access and Preservation as Management Goals

A relationship between access and preservation was addressed as an important, and arguably central, goal for sanctuary management in the 1999 and 2009 management plans, in addition to official statements issued by Thunder Bay National Marine Sanctuary. For example, the 1999 management plan stated in its introduction that the sanctuary should provide “educational opportunities that promote understanding, appreciation, and involvement in the protection and stewardship of underwater cultural resources” and create “a framework for protection and management that relies on governmental cooperation and citizen participation” (USDC, NOAA, OOCR 1999: 29).

The 2009 plan continued along this trajectory, and asserted that the sanctuary should “strengthen protection of Thunder Bay National Marine Sanctuary’s resources [...] while increasing resource access” (USDC, NOAA, ONMS 2009:11) and “use education as a management tool to protect sanctuary resources by increasing public awareness and understanding of the sanctuary’s maritime landscape and by encouraging responsible stewardship of its maritime heritage resources” (USDC, NOAA, ONMS 2009:19). Furthermore, in the 2013 Condition Report for Thunder Bay, which assessed the conditions of the water, living resources, and maritime archaeological resources in the sanctuary, NOAA asserted that

The sanctuary assesses and documents maritime archaeological resources to establish each site’s current state of preservation and to create a baseline for monitoring future impacts. The sanctuary maintains a growing number of moorings at sanctuary shipwrecks, and conducts effective education and outreach programs aimed at fostering a greater preservation ethic among divers and the public. [USDC, NOAA, ONMS 2013j]

These statements exhibited what I referred to as “feedback” language, or phrasing that clearly considers access and preservation as ideally feeding in to one another: The above statements demonstrate that by creating access to underwater heritage in the sanctuary, NOAA aspires to promote a preservation ethic among the public, and by promoting this preservation ethic, NOAA hopes that the sanctuary’s heritage will continue to exist in a condition that will allow it to be accessible to current and future publics. This goal is the same as the feedback loop of access and preservation that is touted by heritage law, policy, and ethics as an ideal management practice for terrestrial and underwater heritage (Figure 3). Clearly, preservation and access are identified goals of the sanctuary in terms of its management plans. My research, discussed below, examined 1999 and 2009 management plans to determine how successful the plans were in integrating and implementing these goals using an analysis of the feedback relationship of access and preservation.

Analyzing the Management of Thunder Bay

Since Thunder Bay's national marine sanctuary designation in 2000, there has only been one study of the sanctuary's management goals. In this study, Vrana and Vander Stoep (2003) discussed management challenges and opportunities for then newly created Thunder Bay National Marine Sanctuary. The methodology for the generation of these challenges and opportunities was not included in Vrana and Vander Stoep's account, so it is unclear how these points were developed. However, several of the challenges and opportunities directly relate to management plans and themes of access and preservation, in addition to how access and preservation can feed into one another. For example, one challenge was "substantially involving local stakeholders in the design, planning, and implementation of maritime cultural landscapes to assure some degree of sustainability of these landscapes over time" (Vrana and Vander Stoep 2003:25).

Some of the suggested opportunities include "integration of the cultural past with the needs of present communities to better protect, manage, and sustain the landscape for the future" and the creation of "meaningful public interpretation of these associations and relationships within protected areas, museums, and visitor centers" (Vrana and Vander Stoep 2003:27). These challenges and opportunities related to managing access to and preservation of submerged cultural resources, as these points spoke to the relationships between stakeholders and heritage. They also touched on the fact that contemporary needs (like recreation) may factor into management considerations, and that public interpretation and sustainable preservation were important goals for the management of underwater heritage.

Vrana and Vander Stoep determined these challenges and opportunities by examining the sanctuary within the larger context of a "maritime cultural landscape," which is a perspective

that considers how shipwrecks do not exist in a vacuum, and must be analyzed in terms of the cultural framework or “landscape” in which they were developed and in which they currently reside (Westerdahl 1992; 1994). Thunder Bay acknowledged the idea of a maritime cultural landscape in both its management plans as an integral part of how the sanctuary is conceptualized in terms of management. For example, the 2009 plan stated that

In addition to helping to protect and interpret individual sites, managing the sanctuary as a maritime cultural landscape reveals a broad historical canvas that can encompass many different perspectives to foster an interconnected understanding of the maritime past. The maritime cultural landscape allows Thunder Bay’s maritime heritage to continue to unfold as new discoveries are made and encourages an increasingly diverse public to find shared meaning in this nationally and internationally significant place. [USDC, NOAA, ONMS 2009:2]

Furthermore, the maritime cultural landscape framework directly translated into the goals of the management plans, as

The strategies and activities contained in Thunder Bay’s Final Management Plan support the sanctuary’s mission to preserve its nationally significant shipwrecks and maritime landscape through resource protection, education, and research, while promoting appreciation and responsible use of Thunder Bay, the Great Lakes, and the oceans. [USDC, NOAA, ONMS 2009:7]

These statements reveal that issues of access and preservation were integral to the maritime cultural landscape management framework Thunder Bay described in its management plans. My research augments Vrana and Vander Stoep’s account of the sanctuary, as this thesis explored in depth how another important sanctuary goal—creating access to and promoting a preservation ethic for underwater heritage—was integrated into the sanctuary’s management plans.

Furthermore, Vrana and Vander Stoep’s chapter was written ten years ago, and did not include the 2009 Final Management Plan or the sanctuary’s proposed expansion in its analysis.

My research analyzed the decision making behind both management plans—not just the 1999 plan—and included consideration of the proposed future expansion. Additionally, instead of just considering the abstract future of Thunder Bay National Marine Sanctuary, I analyzed how

decisions made in the past can be used to think about practical decisions that will need to be made for the proposed expansion of the sanctuary.

Methods for Comparing the 1999 and 2009 Management Plans

My research, as detailed below, compared the 1999 and the 2009 management plans to determine how Thunder Bay National Marine Sanctuary's management strategies for the integration and balance of access and preservation changed in the ten-year interval between the two plans and can be extrapolated to consider the sanctuary's future. In order to make meaningful comparisons between the two documents, I only considered portions of the management plans that would be most salient to my research questions and only included sections that were comparable. These criteria led me to focus my discussion of the management plans to Section 3.C3 (Protecting the Sanctuary Underwater Cultural Resources in Partnership), 3.D (Education: Learning to be Better Cooperative Stewards), and 3.E (Research: Working Together to Better Understand Thunder Bay's Underwater Cultural Resources and Maritime Heritage) of the 1999 Final Environmental Impact Statement/Management Plan and the sections on Resource Protection, Education and Outreach, and Research in the 2009 Final Management Plan.

Within these comparative sections (which I chose to label in the 2009 management plan's terms), I focused both on the broader goals expressed (labeled as goals in the 1999 plan and strategies in the 2009 plan), and the more specific and concrete ideas listed to enact these goals/strategies. In this thesis, I used "strategies" to discuss the broader goals and "activities" when considering the more specific and concrete ideas. For example, a strategy in the Education and Outreach section of the 1999 plan is "develop and implement educational programs that promote awareness and understanding of the Sanctuary underwater cultural resources, Thunder

Bay Maritime heritage, and the NMS Program” and an activity is to “designate a Thunder Bay Kid’s Week” (USDC, NOAA, OOCRM 1999:40-41). I decided to use these strategies and activities for comparison because they were the central focus of the management plans and the way NOAA chose to outline their most important goals for the sanctuary. As such, the strategies and activities would be the part of the management plan in which NOAA would clearly emphasize the interaction and balance of access and preservation as a practical goal of the sanctuary.

In the 1999 plan, the strategies for Research Protection, Education and Outreach, and Research were listed separately from the proposed activities. In the 2009 plan, the activities were nested under specific strategies, and some strategies had one or multiple activities associated with it. For consistency, I disassociated the 2009 strategies from their corresponding activities, as activities and strategies were not directly associated in the 1999 plan. Furthermore, the activities in both plans usually were presented with extensive detailed information. In the 1999 plan, this detail was included in paragraph format under the activity heading, as shown in Figure 8. In the 2009 plan, this detail was listed in bullet points under the proposed activity (Figure 9). I did not directly include this information in my comparative analysis, because its inclusion would flood the other data and muddle potential comparisons. However, I did indirectly use this detail to inform my analysis of the data from both management plans.

For example, I used the detailed information to determine the separation of strategies and activities in terms of access and preservation for Appendices A-D. The tables in these appendices were the main method by which I compared the strategies and activities from the 1999 and 2009 management plans. While some strategies and activities were clearly divisible into the categories of supporting access or supporting preservation, some were not. In cases when a strategy or

Goals

In order to conduct meaningful educational programs that focus on underwater cultural resources and the maritime heritage of the region, the goals of the Thunder Bay NMS will be to:

- develop and implement educational programs that promote awareness and understanding of Sanctuary underwater cultural resources, Thunder Bay maritime heritage, and the NMS Program;
- provide leadership to develop and implement collaborative educational programs that meet the needs and interests of residents, local and regional schools, and visitors to the area;
- act as a clearinghouse of quality educational materials (e.g., curricula, equipment, technology, and expertise), and assist in developing and maintaining an inventory of existing educational programs so they are accessible to educators;
- encourage the involvement of volunteers to foster understanding of and participation in the protection and stewardship of Sanctuary resources;
- ensure that educational programs support overall management goals for underwater cultural resource protection, research, and administration; and

- facilitate the transfer of Sanctuary information and experiences for use locally, regionally, nationally, and globally.

Management Activities for Sanctuary Education

There are many opportunities for the development of Sanctuary educational programs.

Denton and Mahoney (in progress) provide an inventory of existing Great Lakes educational programs. The Great Lakes education study for the Thunder Bay region identifies opportunities to develop educational activities that can be supported and coordinated by the Thunder Bay NMS. These activities are not inclusive. Priorities for Sanctuary education and strategies for implementing these activities will be included in the Education Plan. The Education Plan and education themes will be developed cooperatively by the Sanctuary, the State, the SAC, and appropriate local and regional organizations and institutions.

Educational activities for the Thunder Bay NMS could include:

Establishing Remote Video Hook-ups

The Sanctuary could establish remote video hook-ups of researchers documenting the shipwrecks. This technology would provide visual access to shipwrecks for non-divers. The Sanctuary could also use this video footage to develop presentations for specific age groups. Sanctuary education staff, volunteers, and government or private interests could produce the educational presentations.

Figure 8. Example Page from the 1999 Final Environmental Impact Statement/Management Plan

(USDC, NOAA, OOCRM 2009)

Education & Outreach

STRATEGY ED-2: Increase awareness and knowledge of the sanctuary through education and outreach programs.

Activity 2.1: Expand education offerings for elementary, secondary, and higher education teachers and students, both at the Great Lakes Maritime Heritage Center and throughout the state.

- A. Distribute sanctuary information, curricula, and program information to regional educators through the Centers for Ocean Sciences Education Excellence, National Science Teachers Association, Michigan Education Association, Michigan Science and Social Studies Teachers Associations, and other related associations and conferences.
- B. Develop and implement a series of trainings and workshops for educators.
- C. Conduct educational programs for regional schools.
 - a. Develop a suite of formal education programs for various ages to complement the Great Lakes Maritime Heritage Center exhibits.
 - b. Develop and implement day camp and overnight programs.
 - c. Conduct student workshops and field seminars on sanctuary resources.
- D. Seek opportunities to integrate sanctuary content in undergraduate and graduate level college courses in archaeology and maritime history, as well as museum, aquarium, and science center programs.

Activity 2.2: Provide opportunities for shipboard education in the sanctuary.

- A. Enhance existing shipboard education programs and seek new shipboard education partners and opportunities in Northeast Michigan and the Great Lakes region.
- B. Work with local partners and the community to ensure infrastructure to support and encourage shipboard education programs to visit the sanctuary.
- C. Strive to participate in regional and national sanctuary on-water educational opportunities.



Figure 9. Example Page from the 2009 Final Management Plan
(USDC, NOAA, ONMS 2013)

activity could be considered as promoting both access and preservation, I used the more detailed information to determine in which category to include the strategy or activity. For example, one of the activities in the Research section of the 2009 plan stated, “preserve the Thunder Bay Research Collection and continue to partner with the library to make it accessible to the public” (USDC, NOAA, ONMS 2009:31). While this activity incorporated elements of preservation and access, upon closer examination of the corresponding bullet points, I identified that this activity was primarily intended to promote preservation: Three of the four bullet points focused on preservation practices, and the one bullet point that promoted access simply stated “ensure the collection is publicly accessible, physically and online” (USDC, NOAA, ONMS 2009:31). A similar method was used for other cases from both management plans, and for determining if a strategy or activity included “feedback” language.

Several portions from both management plans were omitted from my analysis. Some of the omitted sections were not directly included in my comparative analysis because they mainly provided background information.² These sections did, however, inform my general discussion of the management plans. Other sections were not included because they did not have a corresponding framework in the other management plan and thus could not be compared.³ The sections from both management plans that discuss the sanctuary’s administration were also omitted.⁴ These sections were not included because the information in these sections was not directly applicable to my research question, as how the sanctuary operates determines how access and preservation are *facilitated*, not how they are intended to be incorporated into

² These sections include Sections 1 (Overview) and 2 (Background) from the 1999 plan and the introductory material from the 2009 plan (USDC, NOAA, ONMS 2009:1-7).

³ These sections include Sections 4 (The Sanctuary Setting), 5 (Alternatives), and 6 (Environmental and Social-Economic Consequences of the Alternatives) from the 1999 plan, and the text box with one goal and several bulleted objectives at the beginning of each section of the 2009 plan.

⁴ These sections include Sections 3.C1 (Administrative Framework) and 3.C2 (Sanctuary Staff and Facilities) from the 1999 plan and the Sanctuary Operations section from the 2009 plan (USDC, NOAA, ONMS 2009:35-41).

decisions about management policy. For this same reason, I did not include cost analysis, budget proposals, or performance measures from either plan. As such, sanctuary operations—and these omitted sections—were considered beyond the scope of this thesis.

Analyzing the Management Plans

Previous discussion of heritage laws and policies established that a balance and interaction between access and preservation is an important goal for heritage management in general. Moreover, Thunder Bay National Marine Sanctuary specifically identified both access and preservation as important management objectives. The following analysis of the 1999 Final Environmental Impact Statement/Management Plan and 2009 Final Management Plan examined if and how an ideal interaction and balance of access and preservation was translated into the strategies and activities. If this ideal interaction and balance of access and preservation was prevalent in the management plans, I expected to observe a relatively equal number of strategies and activities that supported access and supported preservation. I considered any comparisons as balanced if the numerical difference between the two compared criteria was less than two. This would establish that there is an intended balance between access and preservation, and that one is not privileged above the other. I also expected to see relatively frequent usage of feedback language in the strategies and activities. This would establish that Thunder Bay National Marine Sanctuary was strongly emphasizing the interaction potential of access and preservation in its management plans.

Though no other studies have been conducted that analyze management plans with these criteria—and these criteria may not be perfect harbingers of a balanced strategy for access and preservation—they are starting points for a discussion of Thunder Bay's management strategy in

terms of access and preservation. The degree to which these two criteria are observed determined how NOAA makes practical management decisions—as opposed to the ideal balance and feedback loop of access and preservation (Figure 3)—for Thunder Bay National Marine Sanctuary.

Strategies and Activities in the 1999 Management Plan

Several patterns emerged from a comparison of the strategies (Appendix A) and activities (Appendix B) of the 1999 Final Environmental Impact Statement/Management Plan, in addition to how those strategies and activities are distributed in terms of access and preservation and among the Resource Protection, Education and Outreach, and Research sections (Table 2). For example, the amount of strategies was evenly divided among the three sections of the management plan (each with six strategies), and in terms of strategies that promoted access or promoted preservation (each with nine strategies). This balance was also found in the number of strategies in the three sections that promoted access and promoted preservation. While the divisions among Resource Protection, Education and Outreach, and Research were not all numerically equivalent in the number of strategies that promoted access and promoted preservation per section, there was a relative balance, especially in comparison to the strategies in the 2009 plan and the activities in the 1999 plan and the 2009 plan.

This balance was not sustained however, when the activities in the 1999 management plan were analyzed. In addition to a higher total presence of activities (N=23) than strategies (N=16), there were twice as many Education and Outreach activities (N=12) than strategies (N=6), and slightly more than half, or 52%, of the total number of activities were found in the Education and Outreach section. There were also more activities, as a whole, that promoted access (N=14) compared to those that promoted preservation (N=9). Furthermore, while the amount of

Table 2. Quantitative Comparisons of Strategies and Activities for Thunder Bay's 1999 Final Environmental Impact Statement/ Management Plan in Terms of Access and Preservation

	Total Strategies		Access Strategies		Preservation Strategies	
	N	%	N	%	N	%
Resource Protection	6	33	2	22	4	44
Education and Outreach	6	33	4	44	2	22
Research	6	33	3	33	3	33
Total	18		9		9	

	Total Activities		Access Activities		Preservation Activities	
	N	%	N	%	N	%
Resource Protection	4	17	1	7	3	33
Education and Outreach	12	52	11	79	1	11
Research	7	30	2	14	5	56
Total	23		14		9	

	Total Feedback Strategies		Access Feedback Strategies		Preservation Feedback Strategies	
	N	%	N	%	N	%
Resource Protection	0	0	0	0	0	0
Education and Outreach	3	100	1	100	2	100
Research	0	0	0	0	0	0
Total	3		1		2	

	Total Feedback Activities		Access Feedback Activities		Preservation Feedback Activities	
	N	%	N	%	N	%
Resource Protection	2	33	1	25	1	50
Education and Outreach	3	50	3	75	0	0
Research	1	17	0	0	1	50
Total	6		4		2	

strategies that promoted access and promoted preservation were relatively balanced for each of the three sections, this was not the case for the management plan's activities. The activities for Resource Protection were comparatively balanced, with one activity promoting access and two promoting preservation. However, the Research activities were slightly skewed, with five of the seven Research activities promoting preservation. Additionally, all but one of the 12 Education and Outreach activities were intended to promote access. In total, Research activities were 56% of the total activities that promoted preservation and Education and Outreach activities were 79% of the total activities that promoted access.

Feedback Language in the 1999 Management Plan

A focus on Education and Outreach in the 1999 management plan also emerged from an analysis of which strategies and activities included elements of feedback language in their phrasing. Twice as many activities (N=6) demonstrated feedback language than strategies (N=3), and half of the activities and all of the strategies that included feedback language were found in the Education and Outreach section. The Education and Outreach strategies that included feedback language were comparatively balanced between promoting access (N=1) and promoting preservation (N=2). The Education and Outreach activities with feedback language only appeared in the activities that promoted access, and comprised 75% of the total activities that promoted access and demonstrated feedback language. Interestingly, the number of Resource Protection activities that included feedback language were evenly split between promoting access and preservation (with one activity each), and the one Research activity that demonstrated feedback language promoted preservation. This division among the sections—of Education and Outreach feedback activities favoring access, Research feedback activities favoring preservation, and Resource Protection feedback activities equally promoting both

objectives—repeated itself in the 2009 management plan.

Analysis of Trends for the 1999 Management Plan

Based on the focus of Education and Outreach activities in the 1999 management plan, the high number of these activities that promoted access (79%), and the fact that all of the strategies that demonstrated feedback language were found in the Education and Outreach section, it appears that access to education and outreach materials for the submerged cultural resources was a main goal of the sanctuary upon its creation. This focus deviated from the clearly intended balance of the strategies in the 1999 management plan in terms of access and preservation (each with nine) and Resource Protection, Education and Outreach, and Research (each with six).

One reason why the 1999 management plan demonstrated this pattern—balanced strategies, but a focus on Education and Outreach activities—may be because this plan established the sanctuary. When resource managers discuss the feedback loop of access and preservation, the issue of access is mentioned first: Quality access that promotes a preservation ethic must exist before better preservation of the resources can develop. Thunder Bay National Marine Sanctuary's 1999 plan seemed to agree with this idea, as more attention is given to developing activities for Education and Outreach in the short term, though Education and Outreach strategies—the long term plans—were evenly balanced with Resource Protection and Research.

This reason could also explain why feedback language was most prevalent in the Education and Outreach section. If Thunder Bay were intending to heavily promote a preservation ethic through interpretation and other types of access, there would be the most discussion of how access and preservation relate to each other in the Education and Outreach section. This idea was supported by the text of the management plan, as there was a strong presence of feedback

language, especially in the Education and Outreach strategies. For example, strategies denoted that the sanctuary should “encourage the involvement of volunteers to foster understanding of and participation in the protection and stewardship of Sanctuary resources” and “ensure that educational programs support overall management goals for underwater cultural resource protection, research, and administration” (USDC, NOAA, OOCRM 1999:40). Feedback language was not just implied or included in the supplementary text for these strategies; it was boldly and clearly stated.

Overall, though the 1999 Final Environmental Impact Statement/Management Plan was balanced in terms of its strategies that promoted access and preservation across the three sections, it did not exhibit the same balance in terms of activities, and did not have as high or as balanced usage of feedback language as would be expected for a sanctuary that established its desire to integrate access and preservation objectives. Perhaps the imbalance of activities in this management plan demonstrates the difficulties in establishing the overall, idealized goal of integrating preservation and access. The fact that the sanctuary was in its infancy when this management plan was produced may explain, in part, why this is the case.

Strategies and Activities in the 2009 Management Plan

The 2009 plan included slightly less strategies than the 1999 plan (Appendix C), and about twice as many activities as the 1999 plan (Appendix D) and, within the 2009 plan, there were more than twice the number of activities (N=40) as strategies (N=15) (Table 3). Like the 1999 plan, the number of strategies that promoted access (N=8) and preservation (N=7) were balanced. However, unlike the 1999 plan, the activities were also balanced, with 21 promoting access and 19 promoting preservation. Additionally, the number of strategies for the three sections of the management plan was balanced, with each section containing five strategies. This

Table 3. Quantitative Comparisons of Strategies and Activities for Thunder Bay’s 2009 Final Management Plan in Terms of Access and Preservation

	Total Strategies		Access Strategies		Preservation Strategies	
	N	%	N	%	N	%
Resource Protection	5	33	2	25	3	43
Education and Outreach	5	33	5	63	0	0
Research	5	33	1	12	4	57
Total	15		8		7	

	Total Activities		Access Activities		Preservation Activities	
	N	%	N	%	N	%
Resource Protection	13	33	5	24	8	42
Education and Outreach	15	37	15	71	0	0
Research	12	30	1	5	11	58
Total	40		21		19	

	Total Feedback Strategies		Access Feedback Strategies		Preservation Feedback Strategies	
	N	%	N	%	N	%
Resource Protection	1	25	1	25	0	0
Education and Outreach	3	75	3	75	0	0
Research	0	0	0	0	0	0
Total	4		4		0	

	Total Feedback Activities		Access Feedback Activities		Preservation Feedback Activities	
	N	%	N	%	N	%
Resource Protection	4	31	2	29	2	33
Education and Outreach	4	31	4	57	0	0
Research	5	38	1	14	4	66
Total	13		7		6	

pattern extended to the breakdown of activities for the three sections, with Resource Protection (N=13), Education and Outreach (N=15), and Research (N=12) being balanced. Based on this cursory analysis, it seemed that the 2009 plan was more balanced than the 1999 plan.

However, when the strategies and activities were more closely analyzed for the three sections of the management plan, there was an unbalanced tendency in both categories that was initially reflected in the analysis of feedback language in the 1999 management plan. For the 2009 strategies, the Resource Protection section was evenly divided between promoting access (N=2) and preservation (N=3), the Education and Outreach section only promoted access, and the Research section favored preservation, with only one of the five total Research strategies promoting access. The activities in the 2009 plan mirrored this trend, with Resource Protection promoting access (N=5) and preservation (N=8) in only a slightly biased way, Education and Outreach only promoting access, and all but one of the 11 total Research activities promoting preservation. Generally, Education and Outreach favored access (63% of total strategies; 71% of total activities) and Research favored preservation (57% of total strategies; 58% of total activities).

Feedback Language in the 2009 Management Plan

This trend was also evident from an analysis of feedback language in the 2009 plan's activities. Though the number of strategies that exhibited feedback language in the 2009 plan (N=4) was relatively the same as the 1999 plan (N=3), the activities in the 2009 plan (N=13) exhibited more than twice the amount of statements with feedback language as the 1999 plan (N=6). There were also many more activities with feedback language than strategies with feedback language in the 2009 plan. Furthermore, the 13 activities that demonstrated feedback language were evenly divided among Resource Protection (N=4), Education and Outreach

(N=4), and Research (N=5), as well as in terms of access (N=7) and preservation (N=6).

However, when the sections were broken down further, yet again, Resource Protection activities included feedback language that evenly promoted access (N=2) and preservation (N=2), Education and Outreach activities had feedback language that only promoted access (as there were no activities that promoted preservation and demonstrated feedback language), and the Research section's activities with feedback language favored preservation, with only one activity with feedback language promoting access. Overall, Education and Outreach activities were 57% of the total activities that promote access, and Research activities were 66% of the total activities that promote preservation.

This pattern did not exist, however, in the strategies for the 2009 management plan: All four of the strategies that exhibited feedback language promoted access, one of which was in the Resource Protection section, and three of which were in the Education and Outreach section. Feedback language in the strategies for both management plans favored the Education and Outreach section, with all of the 1999 strategies with feedback language and 75% of the 2009 strategies with feedback language promoting access. However, the 2009 plan demonstrated a shift in terms of access and preservation, as the 1999 plan's strategies were evenly distributed between promoting access (N=1) and preservation (N=2), and the 2009 plan's strategies favored access.

Analysis of Trends for the 2009 Management Plan

The overarching trend in the strategies and activities of the 2009 management plan was the Education and Outreach section favoring access (63% of strategies; 71% of activities) and the Research section favoring preservation (57% of strategies; 58% of activities). It could not be concluded that the feedback language in the 2009 plan's strategies supported this trend,

because—though 75% of Education and Outreach strategies demonstrating feedback language promote access—there were no Research strategies with feedback language. Thus, it could not be determined if Research strategies with feedback language would have favored preservation or access. This lack of corresponding data presented the possibility that the presence of feedback language for 2009 (and 1999) strategies was too low to establish consistent patterns, as both management plans had less than five strategies that exhibited feedback language.

However, the repeated tendency of the Education and Outreach and Research section to favor access is important because, though the three sections were shifted in their emphasis, the overall structure of the strategies and activities in the 2009 plan remained balanced. This implied that Thunder Bay did not decide to de-emphasize the dominance of Education and Outreach prevalent in the 1999 plan, but instead continued to emphasize the access/preservation disparity between the Education and Outreach section and the Research section. In the 2009 plan, however, the preservation-promoting activities of the Research section had been significantly increased (seven activities in the 1999 plan; 12 in the 2009 plan) to balance the existing dominance of the access-promoting Education and Outreach section, which only increased slightly between the two plans (12 in 1999; 15 in 2009). This balance was further stabilized by the tripling of Resource Protection activities (4 in 1999; 13 in 2009) that have remained comparatively evenly divided between access and preservation, with a slight preference for preservation.

This shift may have occurred in preparation for the sanctuary's expansion. Thunder Bay National Marine Sanctuary may have wanted to continue the high number of Education and Outreach activities established in 1999, but adjusted its Resource Protection and Research activities to be more robust in order to accommodate the immensely larger area of the sanctuary

and the increased number of shipwrecks that would be protected. Because Education and Outreach strategies and activities usually favored access, Research usually favored preservation, and Resource Protection has been a balance of both, it would have been logical to continue that trend in the 2009 management plan.

Overall, the 2009 plan included a balanced number of strategies and activities in terms of access and preservation, and a balanced number of activities that demonstrated feedback language. However, the Education and Outreach strategies and activities continued to favor access, Research favored preservation, and Resource Protection was balanced between access and preservation. This trend could be explained, in part, by measures to effectively prepare the sanctuary for the proposed expansion.

Summary of Comparative Trends from the 1999 and 2009 Management Plans

The trends revealed through the above analysis complicated what I expected to observe in the management plans. The balance between preservation and access that the two management plans demonstrated mostly fit my expectations, with two exceptions. I did not expect the 1999 management plan to have such an emphasis on access within the Education and Outreach section. I also did not expect the continued trend of the Education and Outreach section promoting access, the Research section promoting preservation, and the Resource Protection section equally promoting both. Instead, I expected each section to have an equal number of strategies and activities that promoted access and preservation, as this would seem to be the most ideal way to balance the strategies and activities. However, overall, my expectations were met, as both management plans exhibited focus on balancing strategies and activities in terms of access and preservation.

In terms of feedback language, my expectations were, again, partially met. Only 22% of

the strategies and activities in the 1999 plan and 30% of the strategies and activities in the 2009 plan exhibited feedback language. Additionally, the use of feedback language was only somewhat consistent, with different sections of strategies and activities differing in the presence of feedback language along the divide of promoting access or preservation. Furthermore, the activities for both plans demonstrated more feedback language than strategies. I expected the strategies—the broader, more long-term goals—to include more feedback language than the short term, more specific activities, because the concept of feedback language is an overarching, more theoretical concept and the strategies more closely align with this type of thinking. However, perhaps heavily using feedback language in the activities was beneficial to the overall function of the management plans, as the importance of the interaction and balance between access and preservation was not lost in the details of the management plans. This is an important consideration as the sanctuary prepares to expand, and there are more strategies and activities to develop and implement.

Perhaps the overall usage of feedback language was lower than expected because there is a cap to how much feedback language can be effectively integrated into a management plan. If all 33 strategies and 63 activities in both management plans included feedback language, the management plan's intended message of integrating access and preservation may have been too repetitive. Feedback language could have flooded the strategies and activities, thus distracting readers from the individual objectives of each strategy and activity, and decreasing the effectiveness of the documents as statements of Thunder Bay's specific management goals.

If this is not the case, including more feedback language in Thunder Bay National Sanctuary's next management plan may be worth considering. This could ensure that the interaction of access and preservation is not understated in the management plan, but instead

made into a solid foundation of the strategies and activities. Furthermore, it might be beneficial to include more feedback language that ties preservation goals back to access goals, as most of the feedback language in the management plans—even the feedback language in strategies and activities that favor preservation—did not mention how a public preservation ethic can loop into more access for most public stakeholders (Figure 3). Instead, most strategies and activities demonstrating feedback language only emphasized the first part of the loop: how creating meaningful access to heritage can create a preservation ethic among the public. Without emphasizing a loop from preservation back to access in the management plans, the potential power of a public preservation ethic may be diminished because Thunder Bay might not consider this part of the loop when making management decisions.

Based on the 1999 Final Environmental Impact Statement/Management Plan and the 2009 Final Management Plan, Thunder Bay National Marine Sanctuary is actively attempting to achieve a balance of interaction in terms of access and preservation in its management plans. This goal is reflected in the ways Thunder Bay has translated the interaction of access and preservation from the management plans to programs for its stakeholders. According to the 1999 Final Environmental Impact Statement/Management Plan, Thunder Bay specifically identified stakeholders as “individuals, groups, or organizations that influence or are affected by the use and management of particular resources” and asserted that “defining people in terms of different stakeholders helps organizations better understand and respond to a diversity of needs, perceptions, expectations, concern, and issues relating to underwater cultural resources” (USDC, NOAA, OOCRM 1999:214). The 1999 management plan included “recreational divers, heritage tourists, dive and tourism business people, museum professionals, historic preservationists, history enthusiasts, researchers, educators, and state and federal resource managers” as the main

stakeholders for the sanctuary (USDC, NOAA, OOCRM 1999:214).

One of the hallmarks of a successful and effective strategy for the management of submerged cultural resources is developing interpretive initiatives that target both diving and non-diving stakeholders (Scott-Ireton 2007:22). The 1999 plan created many programs, policies, and facilities that benefited these stakeholder groups and promoted access and preservation in a way that reflected the tendency for Education and Outreach strategies and activities to favor access, Research strategies and activities to promote preservation, and Resource Protection efforts to equally promote access and preservation.

For example, Thunder Bay created a Great Lakes Maritime Heritage Trail; established a free museum and educational space, the Great Lakes Maritime Heritage Center; hosts an ROV-building competition; provides lesson plans for teachers, distance-based learning programs (i.e. live expeditionary broadcasts), school tours, and shipboard tours; and provides information for divers, fishermen, kayakers, snorkelers, and those interested in glass bottom boat tours (USDC, NOAA, ONMS 2009, 2013a, 2013b). Each of these Education and Outreach initiatives promote access. Additionally, the sanctuary's research efforts support preservation goals, as Thunder Bay sustains research on the natural, cultural, and historical resources within its boundaries, prioritizes the archiving of historical maritime artifacts and documents, and provides vessels outfitted for research (USDC, NOAA, ONMS 2013f).

Furthermore, Thunder Bay maintains a mooring buoy system at popular shipwrecks for the diving and snorkeling public, which is a Resource Protection initiative that promotes preservation and access. Thunder Bay also protects the submerged cultural resources located in the sanctuary by partnering with the U.S. Coast Guard and the Michigan Department of Natural Resources and the Environment to enforce the state and federal laws that protect underwater

heritage (USDC, NOAA, ONMS 2013d). The sanctuary also relies on these partnerships to enforce the regulations for Thunder Bay, which clearly outline allowed and prohibited activities, in addition to penalties and information about permits (USDC, NOAA, ONMS 2013e). These are Resource Protection goals that promote preservation, while also facilitating the rules for public access.

The 2009 Final Management Plan, in general, continued to consider the needs of the stakeholders identified in the 1999 plan and created access for these stakeholders while also promoting preservation efforts. Perhaps most commendably, the 2009 plan tentatively attempted to more actively include recreational divers and the local diving businesses, thus trying to move forward from the traditionally poor relationship between heritage managers and divers (Vander Stoep et al. 2002). These initiatives, again, align Resource Protection with equally promoting access and preservation. For example, one of the Resource Protection activities stated that NOAA will “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” (USDC, NOAA, ONMS 2009:12). To accomplish this goal, NOAA planned to “develop procedures to allow users to easily and voluntarily report recreational use of the resources and provide incentives for reporting use” and “work with dive stores and charter boats to document recreational use of the resources” (USDC, NOAA, ONMS 2009:12). NOAA aims to

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. [USDC, NOAA, ONMS 2009:14]

These efforts represent an attempt to incorporate the avocational archaeologists of the underwater world—active members of the diving community—into Thunder Bay’s management plan while also demonstrating how providing access can feed into preservation efforts.

The patterns that emerged from Thunder Bay's 1999 Final Environmental Impact Statement/Management Plan and 2009 Final Management Plan complicated my expectations for how a management plan for underwater heritage might be ideally balanced in terms of promoting access and preservation. However, in both plans, the sanctuary discovered a way to provide access to and ensure the preservation of underwater heritage in the context of the realities of submerged cultural resource management. Thunder Bay did this by allowing each section of the management plan—Resource Protection, Education and Outreach, and Research—to embrace their inherent potential for access and preservation, and complement and support each other in terms of the overall structure of the management plans.

The degree to which this strategy is effective, especially in terms of the sanctuary's proposed expansion, should be revisited in the future. After all, if Thunder Bay National Marine Sanctuary has found a successful structure for implementing and balancing access and preservation in their management plans, other parks, preserves, sanctuaries, and trails that manage underwater heritage will benefit from the further study of a management strategy that can effectively bridge the gap between the abstract of management frameworks and the tough realities of submerged cultural resources management.

Suggestions for the Sanctuary's Future

Creating meaningful access to heritage is a crucial first step in the feedback loop of heritage management, and as discussed above, Thunder Bay National Marine Sanctuary creates access to its submerged cultural resources in many ways. Based on my research for this thesis, my analysis of the 1999 and 2009 management plans, and my personal experiences at Thunder Bay, I would like to make some suggestions that have the potential to greatly enhance the efforts

of Thunder Bay to further develop the overall accessibility of its underwater heritage that will reinforce the importance of preserving these shipwrecks for future generations. The sanctuary may want to consider these suggestions as the proposed expansion moves forward, and the opportunities and challenges for creating meaningful public access increase.

Though the sanctuary was generally inclusive in terms of its stakeholders, Thunder Bay's 2009 Final Management Plan had some gaps in the public stakeholder groups it addressed. Beyond education and outreach programming for students and teachers, the rest of the general non-diving public is not explicitly focused on in terms of the 2009 management plan's strategies and activities. To strengthen this realm of the sanctuary's public programming—and thus address the needs of more stakeholders—the sanctuary should consider pursuing two projects that have the potential to vastly increase access for its stakeholders and feed back into the sanctuary's preservation initiatives: improving their website and promoting access to *in situ* beached wrecks.

These strategies can greatly increase the quantity of stakeholders who can have a higher quality of direct and indirect access to underwater heritage. For example, if Thunder Bay further developed its existing website with more integrated, exciting, and educational information on submerged cultural resources, the sanctuary would have the opportunity to reach the 75 percent (or more) of American households that have Internet access (Watts and Knoerl 2007:232). After all, for the non-diving public, “the internet may well offer the most exciting opportunity for sharing the excitement of discovering our maritime heritage” (Watts and Knoerl 2007:239). Additionally, if Thunder Bay were to establish programs involving beached wrecks, “everyday people, not just archaeologists and divers can [...] see and touch and conjecture about shipwrecks and the past and present realities they represent” (Halsey 2007:168). Thunder Bay National Marine Sanctuary should consider these suggestions as the sanctuary moves forward with its

plans for expansion.

Shipwrecks in the Virtual World

The heritage world has been grappling with how to effectively use the Internet for access and preservation goals since the Internet was developed (Abid and Radaoykov 2002; Badanelli and Ossenbach 2010; Evens and Hauttekeete 2011; Kunda and Anderson-Wilk 2011; Manders 2008; Tonta 2008). The Internet's power lies in its ability to engage individuals who might not have the ability to physically visit a heritage site, and to continue engaging individuals who did have the opportunity to visit the heritage site, after their experience. This potential is even more potent for underwater heritage, as compared to terrestrial heritage, because only a small percentage of the public is able to access submerged cultural resources. The Internet may provide a platform for non-divers to access rich and engaging virtual worlds for underwater heritage sites (Watts and Knoerl 2007:223-5). While it is beyond the scope of this thesis to make specific design and content recommendations for Thunder Bay's website, I would like to stress the importance of the Internet in allowing more stakeholder to access the sanctuary's resources and the sanctuary to promote a preservation ethic.

The 2009 Final Management Plan included consideration of Thunder Bay National Marine Sanctuary's website,⁵ with one Education and Outreach activity stating NOAA's desire to "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" (USDC, NOAA, ONMS 2009:23). Thunder Bay's current website provides helpful information on visiting the sanctuary, how to get involved, what types of programs the sanctuary offers, and the history of the sanctuary and the heritage it protects. The website also incorporates Web 2.0 components in the form of badges linking to

⁵ thunderbay.noaa.gov

Thunder Bay's Facebook, Twitter, and YouTube pages (USDC, NOAA, ONMS 2013).

However, the sanctuary could further develop its website to be more engaging for the public. Most of the site is static; there are few videos or interactive elements for visitors, unless they access the connected social media sites, that would allow stakeholder to explore the sanctuary's history and heritage in an interesting way.

The standout feature of Thunder Bay's current website is the detailed information on the shipwrecks located in and around the sanctuary that is made highly accessible and engaging on the website. Visitors can search for individual vessels by name, or explore an interactive map that layers clickable portions of Lake Huron and selectable shipwrecks. If a visitor clicks on a shipwreck icon or searches for a vessel by name, they are directed to a webpage featuring pictures of the sunken vessel and information on its location, measurements, history, and description. Most vessel webpages include a link to the online Vessel Database of the George N. Fletcher Alpena County Public Library. This site usually includes more detailed information on a vessel's history, historical images of the vessel, and scanned images of important documents, such as ship manifests or insurance papers. Some vessels may also have a link to site plans of the shipwreck, which depicts, in detail, how the wreck is currently situated and where the mooring buoy, if one is placed at the site, is located. Many stakeholder, including the diving public, maritime historians, and laypeople interested in shipwrecks will find this information on Thunder Bay's shipwrecks informational and engaging (USDC, NOAA, ONMS 2013c).

One of Thunder Bay's website's weakest points is its presentation of information on the sanctuary's preservation efforts. While there is extensive information on current archaeological, historical, and marine research, preservation efforts, and conservation efforts, Thunder Bay's current website design of long pages of textual information and a small font size may turn off

visitors from engaging with the material (USDC, NOAA, ONMS 2013f). When considering updates for its website, Thunder Bay should try to incorporate more interactive elements instead of static webpages in order to provide more virtual access to underwater heritage for its stakeholders.

One potential model Thunder Bay could consider is the website for the *H. L. Hunley*,⁶ the Confederate submarine from the U.S. Civil War. This website includes detailed and interactive information on the history of the submarine, documentation of the archaeological excavation, the recovery of the vessel, and the ongoing conservation efforts, and provides virtual exploration of the *Hunley* via a virtual tour of the vessel's remains and a simulation that allows visitors to conduct a mission in a virtually reconstructed *Hunley* (Watts and Knoerl 2007:225). If Thunder Bay were to incorporate some of these elements into its website, the sanctuary might be able to not only increase stakeholder access to underwater heritage, but also further promote a positive preservation ethic among its stakeholders.

However, as with all heritage sites, funding is usually limited and new, high-caliber websites can be expensive (Watts and Knoerl 2007:232-3). Additionally, if the proposed expansion moves forward, the sanctuary will have a vast new territory and twice as many shipwrecks to monitor and protect, and funding, resources, and personnel will most likely prioritize initiatives for the authentic wrecks over website development. However, though the sanctuary might not be able to concentrate its resources or attention on a redesign of its website, there are simple, low-cost options that could be implemented and could create public access to information about the sanctuary and its preservation efforts.

For example, Thunder Bay could utilize free blogging software to create a “behind the scenes” blog on which a staff member or intern discusses elements of the sanctuary’s

⁶ www.hunley.org

preservation efforts. In this example, the information will be presented in manageable pieces (instead of a static information dump), readers will be able to comment on the blog posts and thus interact with the information, and the sanctuary can promote the blog via its social media accounts. Though this is just one example, and the general limitations and challenges of the website should be acknowledged and mitigated, the potential of the Internet to engage and provide access to a vast number of stakeholders and promote a preservation ethic among these stakeholders should not be ignored as Thunder Bay considers its future.

The Benefits of Beached Wrecks

O'Shea (2004) and Halsey (2007) have greatly espoused the research and interpretive potential of beached wrecks in the Great Lakes. Beached wrecks, also known as "scattered wrecks," result from vessels that wrecked in shallow water and were not recovered or repurposed, thus remaining, decomposing, and drifting in their broken form. These types of wrecks are common in the Great Lakes, especially on the western Lake Huron shore, and are often highly visible and accessible from land (Halsey 2007:158; O'Shea 2004:2). In terms of underwater heritage management interpretive strategy, beached wrecks represent an invaluable opportunity: allowing the non-diving public to directly access authentic shipwrecks.

With Thunder Bay National Marine Sanctuary's proposed expansion, the diving public will have a substantial increase in the heritage sites they will have access to, as there will be 39 new known wrecks and 60 new potential wrecks to explore (USDC, NOAA, ONMS 2013h). Beached wrecks are a way to increase direct access to the sanctuary's heritage for non-divers. This could be accomplished through the Education and Outreach activity of the 2009 Final Management Plan that states the sanctuary should "Continue to develop the Great Lakes Maritime Heritage Trail in Alcona, Alpena, and Presque Isle counties" (USDC, NOAA, ONMS 2009:24).

Sanctuary staff members are aware that there is an easily accessible, relatively intact, and intellectually intriguing wreck located in the Harrisville Harbor in Harrisville, MI. When I participated in the University of Michigan Underwater Archaeology Field School at Thunder Bay National Marine Sanctuary, myself and the other field school participants conducted a shoreline survey from Alpena, MI to Oscoda, MI. During the shoreline survey, we documented many beached wrecks. One of the most easily accessible wrecks located in a public area (i.e. not in a bog or abutting private property) was a piece of hull submerged in the less than three feet of water in the Harrisville Harbor. This beached wreck has the potential to provide an opportunity for non-diving stakeholders to directly interact with an authentic wreck, engage with Thunder Bay's cultural heritage, and recognize the importance of preservation as a management goal.

For example, when I took my family to see the shipwreck at the Harrisville Harbor, it was simple to park our car and walk into the water to the wreck site. I was able to interpret the beached wreck in a way that explained to my family how we had studied beached shipwrecks at the field school, how common beached shipwrecks are, and how what they were observing was similar to what a sunken wooden vessel would look like if they were diving. My family expressed that, after interacting with an authentic shipwreck, they more clearly understood why underwater archaeology is important, how underwater archaeology is conducted, and the fascinating nature of interacting with underwater heritage.

Because this wreck is so easily accessible and the sanctuary is intending to expand its Great Lakes Maritime Heritage Trail into Alcona county, in which Harrisville is located, if the proposed expansion is adopted, it would be beneficial to the non-diving public to include a trail marker at the Harrisville Harbor. However, this suggestion illustrates the difficulty of balancing access and preservation in terms of heritage management: creating access to the beached wreck

in Harrisville Harbor opens up the possibility that the wreck's current state of preservation might deteriorate with increased visitation to the site. Because of this possibility, Thunder Bay and the city of Harrisville will have to consider whether the pros of access outweigh the cons of preservation in this situation.

If the decision is made to provide public access to the beached wreck, there will have to be consideration as how to best facilitate access while ensuring as high a level of preservation as possible. Some options include stationing a tour guide at the harbor at pre-appointed times to provide a guided exploration of the wreck, or posting signage that could direct interested visitors to the wreck site. Alternatively, Thunder Bay could acknowledge that increasing public access to this site would unavoidably deteriorate the shipwreck, and could consider using this beached wreck as "sacrificial site" used to demonstrate to visitors what happens when the public loots or negatively interacts with underwater heritage site. This is an unfortunate future for the beached wreck in Harrisville Harbor, but the site could be an extremely powerful interpretive tool to link access and preservation efforts. A sacrificial beach wreck could save other shipwrecks from similar fates and create stewards out of the stakeholders who visit the beached wreck. While there are admittedly many issues to consider, there is much potential in the interpretive powers of beached wrecks for Thunder Bay National Marine Sanctuary. As Halsey remarked, "It is the immediacy of these remains and their generally unhindered accessibility, physically and intellectually, that gives them the unique ability to inform and to tantalize at the same time" (2007:169).

Closing Thoughts

Access to and preservation of underwater heritage are complicated and intertwined issues,

rendered even more complex by the federal legislation and international policies that have, for the last fifty years, shaped the overarching strategies for the management of submerged cultural resources. Managers of underwater heritage have been consistently challenged by the legal and ethical mandates in heritage management policy, yet they have developed creative solutions to ensure that submerged cultural resources are preserved and accessible. Thunder Bay National Marine Sanctuary's 1999 Final Environmental Impact Statement/Management Plan and 2009 Final Management Plan demonstrated how heritage managers have been able to navigate this complexity.

My analysis of the management plans determined that Thunder Bay created a balance of access and preservation by allowing the three sections of the management plans—Resource Protection, Education and Outreach, and Research—to naturally gravitate toward the initiative (access or preservation) each section would most effectively promote while also keeping an overall balanced approach for how many strategies and activities promoted access and preservation. The management plans also exhibited a presence of feedback language that translated into some Thunder Bay's implemented policies and programs. By studying these management plans, I have gained insight into how heritage managers make decisions when determining how best to preserve underwater heritage and make submerged cultural resources more accessible.

Thunder Bay has been able to grapple with the “balancing act” of access and preservation, and as the sanctuary moves forward with its proposed expansion, it will be interesting to see if and how management strategies evolve to meet new challenges. It is possible that other underwater—and terrestrial—heritage management sites that are struggling with translating the ideal balance of access and preservation into tangible, concrete, and implementable management

strategies can learn from the sanctuary's outlined management strategies. This may be especially true for the many underwater heritage sites in Michigan; after all, Thunder Bay was the first underwater preserve in the state of Michigan and the first of those preserves to be designated a national marine sanctuary—it is an invaluable management model for other preserves.

Thunder Bay, however, is just one sanctuary in a world full of submerged cultural resources. There are many other sanctuaries, parks, trails, and preserves around the world, and more information on how underwater heritage is preserved and made accessible is needed to ensure that submerged cultural resources remain protected and, when possible, enjoyed by public stakeholders. Shipwrecks will continue to fascinate us. In return, we must continue to vigilantly safeguard their future.

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**Appendix A: Management Strategies for Access and Preservation in Thunder Bay’s
1999 Final Environmental Impact Statement/Management Plan**

	Intended to Promote Access	Intended to Promote Preservation
Resource Protection	<p>Establish innovative partnerships with agencies, organizations, and institutions that support the underwater cultural resource mission of the Sanctuary</p> <p>Develop and maintain community involvement through diverse volunteer and private sector initiatives</p>	<p>Coordinate management activities with other governmental and non-governmental programs that protect underwater cultural resources</p> <p>Establish an effective enforcement program for Sanctuary regulations that protects underwater cultural resources</p> <p>Develop and implement effective emergency response and underwater cultural resource damage assessment programs</p> <p>Ensure that management decisions are based on the best available information, but where such information is incomplete, follow those options that best protect Sanctuary underwater cultural resources</p>
Education and Outreach	<p><i>Develop and implement educational programs that promote awareness and understanding of the Sanctuary underwater cultural resources, Thunder Bay maritime heritage, and the National Marine Sanctuary Program¹</i></p> <p>Act as a clearinghouse of quality educational materials (e.g. curricula, equipment, technology, and expertise), and assist in developing and maintaining an inventory of existing educational programs so they are accessible to educators</p> <p>Facilitate the transfer of Sanctuary information and experiences for use locally, regionally, nationally, and globally</p>	<p><i>Encourage the involvement of volunteers to foster understanding of and participation in the protection and stewardship of Sanctuary resources</i></p> <p><i>Ensure that educational programs support overall management goals for underwater cultural resource protection, research, and administration</i></p>

¹*Italicized text designates strategies that are considered as exhibiting “feedback” language.*

	Intended to Promote Access	Intended to Promote Preservation
Education and Outreach	Provide leadership to develop and implement collaborative education programs that meet the needs and interests of residents, local and regional schools, and visitors to the area	
Research	<p>Develop and encourage collaborative programs with other agencies, organizations, and businesses</p> <p>Identify and evaluate the monetary and intrinsic values associated with Sanctuary underwater cultural resources (e.g. historical, recreational, economic, aesthetic)</p> <p>Encourage research targeted at management issues such as multiple-use conflicts and understanding user impacts</p>	<p>Inventory and assess Sanctuary underwater cultural resources, and existing and potential threats to those resources (both natural and human-induced)</p> <p>Monitor Sanctuary underwater cultural resources to ensure their long-term protection and to evaluate management practices</p> <p>Develop a research plan that places the highest priority upon research that addresses threats to Sanctuary underwater cultural resources</p>

**Appendix B: Management Activities for Access and Preservation in Thunder Bay’s
1999 Final Environmental Impact Statement/Management Plan**

	Intended to Promote Access	Intended to Promote Preservation
Resource Protection	<i>Developing and maintaining a mooring buoy system¹</i>	Coordinating management agencies Cross-deputizing and supporting enforcement <i>Science-based decision making</i>
Education and Outreach	Establishing remote video hook-ups <i>Developing a “Thunder Bay Shipwreck Trail”</i> Create a Maritime Heritage Center <i>Designate a Thunder Bay Kid’s Week</i> <i>Producing an historical guide</i> Develop public outreach activities to promote the sanctuary Identifying and supporting a network of volunteers Developing sanctuary education themes Providing leadership in technology Supporting and enhancing existing education programs Developing and maintaining supplemental education programs	Acquire a Vessel
Research	Inventorying and locating historical materials Monitoring of tourism-related impacts	Archaeological inventory and assessment Completing preliminary historic research <i>Recreational diving impacts</i> Zebra mussels, shipwrecks, and recreational diving

¹*Italicized text designates activities that are considered as exhibiting “feedback” language.*

	Intended to Promote Access	Intended to Promote Preservation
Research		Conducting a theme study

**Appendix C: Management Strategies for Access and Preservation in Thunder Bay’s
2009 Final Management Plan**

	Intended to Promote Access	Intended to Promote Preservation
Resource Protection	<p>Assess and evaluate recreational use of sanctuary resources</p> <p><i>Increase and encourage access and responsible use of sanctuary resources by fostering great awareness among recreational users¹</i></p>	<p>Increase compliance with sanctuary regulations and other applicable state and federal laws</p> <p>Preserve and curate maritime heritage artifacts</p> <p>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</p>
Education and Outreach	<p><i>Increase awareness and knowledge of the sanctuary by developing education and outreach materials for a broader audience</i></p> <p><i>Increase awareness and knowledge of the sanctuary through education and outreach programs</i></p> <p><i>Enhance sanctuary communications to create greater awareness</i></p> <p>Maintain and expand Thunder Bay National Marine Sanctuary community presence</p> <p>Maximize the impact and effectiveness of education and outreach efforts, including interpretation at the Great Lakes Maritime Heritage Center and Trail, through ongoing evaluation</p>	
Research	<p>Utilize volunteers, students, fellows, and interns for sanctuary characterization, research, and monitoring</p>	<p>Characterize the sanctuary’s maritime heritage resources and landscape features</p>

¹ *Italicized text designates strategies that are considered as exhibiting “feedback” language.*

	Intended to Promote Access	Intended to Promote Preservation
Research		<p>Continue partnerships with Alpena County George N. Fletcher Public Library to manage the Thunder Bay Sanctuary Research Collection</p> <p>Develop a monitoring program for sanctuary maritime heritage sites</p> <p>Develop partnerships with local, state, national, and international researchers and organizations to enhance sanctuary research programs</p>

**Appendix D: Management Activities for Access and Preservation in Thunder Bay’s
2009 Final Management Plan**

	Intended to Promote Access	Intended to Promote Preservation
Resource Protection	<p><i>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 users¹</i></p> <p>Provide practical information for users such as shipwreck locations and information, access points, regulations, and contact information</p> <p><i>Maintain existing and install additional mooring buoys at shipwreck sites to protect shipwrecks from anchor damage and to facilitate shipwreck access</i></p> <p>Work with other agencies, local governments, and non-governmental organizations to improve recreational access along Lake Huron</p> <p>Make artifacts available to the public and to professionals via exhibits, loans, and selected access to the artifact collection</p>	<p>Initiate a public process to consider the advisory council’s recommendation to expand the sanctuary boundary</p> <p>Develop an Environmental Impact Statement to meet requirements under the National Environmental Policy Act, if the analysis conducted results in a recommendation to expand the boundary</p> <p>Ensure sufficient patrol presence in the sanctuary through partnerships and interagency coordination</p> <p><i>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</i></p> <p><i>Use interpretive enforcement as a tool to inform users about sanctuary regulations</i></p> <p>Continue development of infrastructure for conservation laboratory and curation facilities for the long-term storage of artifacts</p> <p>Evaluate the use of technology to enhance enforcement efforts</p>

¹ *Italicized text designates activities that are considered as exhibiting “feedback” language.*

	Intended to Promote Access	Intended to Promote Preservation
Resource Protection		Establish membership criteria and procedures for an accessions committee to evaluate donation criteria and artifact handling policies
Education and Outreach	<p>Develop education materials and lessons for students and educators</p> <p><i>Develop outreach materials for a wide variety of users</i></p> <p>Expand education offerings for elementary, secondary, and higher education teachers and students, both at the Great Lakes Maritime Heritage Center and throughout the state</p> <p>Provide opportunities for shipboard education in the sanctuary</p> <p>Bring Thunder Bay National Marine Sanctuary content to a national audience through distance learning</p> <p>Utilize remotely operated vehicles (ROV) and research technology in sanctuary education</p> <p>Develop and implement a marketing plan to promote the sanctuary and the Great Lakes Maritime Heritage Center and Trail</p> <p><i>Sponsor, organize, and participate in outreach opportunities that promote the sanctuary's mission and that allow for dissemination of sanctuary information</i></p> <p>Provide way-finding and promotional signage for the sanctuary and the Great Lakes Maritime Heritage Center and Trail</p>	

	Intended to Promote Access	Intended to Promote Preservation
Education and Outreach	<p>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</p> <p>Continue to develop the Great Lakes Maritime Heritage Trail in Alcona, Alpena, and Presque Isle counties</p> <p>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</p> <p>Conduct and assessment of the economic impact of the sanctuary</p> <p><i>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</i></p> <p><i>Develop and implement an ongoing system to evaluate and improve education and outreach programs</i></p>	
Research	<p><i>Recruit, train, and retain volunteers to assist sanctuary staff on various research projects and with the Thunder Bay Sanctuary Research Collection</i></p>	<p>Conduct historical and archival research on potential maritime heritage resources and landscape features in and around the sanctuary</p> <p>Prioritize archaeological documentation of identified maritime heritage resources to establish baseline data for long-term monitoring</p>

	Intended to Promote Access	Intended to Promote Preservation
Research		<p><i>Continue to develop the sanctuary's Geographical Information System (GIS) for archaeological, historical, and geographical data management and dissemination</i></p> <p><i>Preserve the Thunder Bay Sanctuary Research Collection and continue to partner with the library to make it accessible to the public</i></p> <p>Evaluate opportunities to increase Thunder Bay Sanctuary Research Collection holdings</p> <p>Develop partnerships to characterize the sanctuary's maritime heritage resources</p> <p>Establish partnerships with universities, colleges, and other institutions to establish a robust program for student research internships and fellowships</p> <p>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</p> <p>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.</p> <p><i>Develop and implement a long-term monitoring plan to determine the natural and human impacts on maritime heritage sites</i></p>

	Intended to Promote Access	Intended to Promote Preservation
Research		<i>Conduct systematic remote sensing and visual surveys to locate and identify maritime heritage resources and landscape features in the sanctuary</i>