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MICHIGAN'S COASTAL WATERS:
A PILOT STUDY
IN
UNDERWATER CULTURAL RESOURCES

by

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INTRODUCTION

Underwater archaeological resources, which are not generally recognized as such, abound in the Great Lakes. Collectively shipwrecks and their artifacts represent one of the most important sources of archaeological data in the entire nation. However, people and natural elements are rapidly destroying them. In the past, both the general public and researchers have largely ignored these resources. However, with the advent of inexpensive diving equipment, interest in them has blossomed. This interest has been coupled with an increased awareness of the historical and archaeological value of these resources, and the need for the preservation, protection, and management of them.

Various groups including archaeologists, historians, divers, and the general public have made the State of Michigan aware of the value of its underwater sources and the state is in the process of drafting legislation towards their regulation. Throughout the course of several years, numerous pieces of legislation have been introduced by State legislators regarding the protection of underwater cultural resources. In July of 1980, House Bill 4601 was approved by the state government, and signed by the Governor, and the resulting Public Act 184 became the first major law dealing with these resources. In general this act (1) gave the State of Michigan the right to regulate the use of cultural resources in the bottomlands of the Great Lakes (2) established a permit system for salvage and (3) established bottomland preserves. This latter element is of particular relevance in that it allows the State Department of Natural Resources to administer the preserves which most likely will include their use as underwater parks. Therefore this piece of legislation integrates the historical/archaeological value of cultural resources with the recreational component of these same resources. Underwater park-preserves are the active mechanism by which this integration can take place.

The State of Michigan, in an attempt to lessen adverse exploitation of its valuable underwater resources, has established some basic guidelines for their use. The creation of a permit system for salvaging, which is reviewed by a State Underwater Salvage Committee, has been a positive step towards the preservation of historically valuable shipwrecks. However, what is needed at this time is a comprehensive management program for the protection, preservation and intelligent use of all underwater cultural resources in state waters.

A research project was initiated recently (July 1, 1977) at Michigan State University in order to explore how to manage these underwater resources wisely. The focus of this research is the assessment of shipwreck concentration areas for underwater park-historical preserves. These park-preserves would both protect historic shipwrecks and allow for professional and recreational investigation of them to the benefit of both researchers and the general public. The project is coordinated through the MSU Department of Park and Recreation Resources and is funded with monies supplied by the Michigan Sea Grant Program.

This report provides a basic outline for the management of underwater archaeological resources in Michigan's Great Lakes waters. It recommends the establishment of both underwater historical preserves and park-preserves on state bottomlands. This report should be regarded both as a first step towards a discussion of an extremely complex problem, and as a study of the feasibility of one management concept. Finally, this report, while making note of recreational use of these resources where appropriate, is primarily directed toward increasing reader awareness of the archaeological aspects of underwater cultural resource management.

HISTORICAL BACKGROUND

Ships of the Great Lakes played a major role in the development of the region, as well as the American nation. Many of these vessels, of various types, sizes, and functions now lie on the bottomlands, awaiting discovery and scientific exploration. From the bark canoes of the Native Americans to the giant steel ore carriers of today, watercraft have influenced the settlement, lifeways, and industry in the Great Lakes region. The waterways of the Great Lakes provide an efficient, though sometimes deadly, means of transportation which Michigan's inhabitants have used for thousands of years. During the last 300 years alone, thousands of vessels have sailed the Inland Seas, and countless numbers still remain there today -- settled in watery graves beneath the waves. An estimated 6,000 major vessels have met their deaths on the Lakes since the first white men ventured into the area, and well over a thousand of these ships now lie below Michigan's waters.

Built near Niagra and completed in July of 1679, the legendary Griffin was the first large trading ship on the Great Lakes. This vessel was approximately 40 feet in length with a capacity of 45 tons, and was designed as a cargo ship for use in the fur trade. During the return trip of her maiden voyage to Green Bay, Wisconsin, in September 1679, the Griffin was lost. The fate of the Griffin, her cargo of val-

uable furs, and her crew of five remains a mystery even today. This was the first recorded sinking in the Great Lakes but it was certainly not the last.

The large lake-going canoes of the fur traders, also used during the seventeenth and eighteenth centuries, were recognized as the most efficient form of transportation on the Lakes. Carrying five tons of cargo, and measuring up to 30 feet in length, these canoes could quickly put to shore in case of storms or trouble. For this reason, canoes, rather than large sailing ships, became the early freighters of the Great Lakes region. Although the Griffin met an untimely demise, the idea of large sailing vessels did not die. As the increasing numbers of settlements in the region, large amounts of trading goods and supplies had to be transported over long distances. These goods and supplies via waterways as land routes were either non-existent or poorly developed. Canoes alone could not carry the cargo, and eventually larger and more efficient sailing ships were built for use on the Great Lakes.

Like the Griffin, most of the ships of the late seventeenth and eighteenth centuries were used to carry large quantities of supplies to missionaries, fur traders, and soldiers. Cargoes of metal tools, weapons, clothing, and foodstuffs were commonplace in the early days of Great Lakes sailing. These vessels supplied settlements in Michigan such as Fort Michilimackinac, Detroit, du Baude (at St. Ignace), and St. Joseph (near Niles). With the establishment of French, and later English, military posts in the Great Lakes, warships also sailed the region. Somewhat later in the eighteenth century American ships entered the scene, but did not control the Lakes until after the War of 1812.

During the first half of the 1800s the number of sailing vessels in Michigan's waters rose substantially due to the boom in the lumber industry. Midwestern settlements were springing up everywhere and timber resources were needed throughout the nation. Since inland roads and railways were still in their infancy at that time, the shipping industry provided the primary method of transportation. Shipping vessels of many types and sizes became commonplace on the Great Lakes -- as did shipwrecks. Increasing commerce and industry in the region led to an increased demand for labor. To supply this need, immigrants from Scandinavia and Europe streamed into the Midwest, many on sailing ships bound for the major ports on the Great Lakes. The vessels which carried these people, like all vessels of the time, were wind powered, and white sails dotted the Lakes. Most of the early settlements in Michigan, at that time, were located in the lower peninsula along the major water routes which twist

through the state. Consequently, most shipwrecks occurred in the much traveled Lakes Michigan and Huron, as well as the Mackinac Straits area. The legendary storms of late fall and early spring, combined with difficult winds and hazardous shorelines, caused the demise of many of these sailing vessels. Floundering in storms and strandings in shallow waters near the shorelines took heavy tolls of life, cargo, and vessels.

With the invention and adoption of steam power in the mid 1800s, vessels became capable of greater speed and improved maneuverability. Shipwrecks due to fire were, however, the price that had to be paid for this technological improvement. Sparks from the boiler rooms often ignited the flammable timbers of the wooden hulled vessels, and many quickly burned to the waterline and sank. Mishaps such as fires were considered just one more risk that had to be faced while satisfying the growing demand for ship-borne goods.

In the latter half of the nineteenth century the lumber industry began to deplete the resources of Michigan's lower peninsula. As the demand for lumber to build new towns and to rebuild others such as Chicago continued to increase the logging companies expanded to the north and began their operations in the upper peninsula. The period 1850-1900 also saw that establishment of a major iron industry along the Lake Superior shore which relied heavily upon the region's dense forests to supply the charcoal needed to fuel massive stone furnaces. Transportation of timber, iron, grain, and supplies became an essential part of the industrial network in the Great Lakes Region. Economic survival would have been impossible without the completion of the locks at Sault Ste. Marie in 1855, allowing passage from Lake Superior to the lower Lakes. Vessels of both wind and steam power soon multiplied on Lake Superior. By the turn of the century the upper peninsula had become the industrial heart of the Great Lakes region. This did not happen, however, without a price. During the course of this industrial growth and expansion, many vessels were lost in all the Great Lakes. Lakes Superior and Michigan became well known for their treachery as they swallowed thousands of ships carrying iron and timber.

By the first decades of the 1900s the virgin forests of Michigan had been ravished and were quickly becoming scarcer and scarcer. The iron industry, plagued by a lack of fuel and increasing costs, was forced to close down the many forges and furnaces in operation. Lumbering slowed considerably and by 1920 many logging companies realized that transportation

of iron ore rather than finished iron was the key to success. The sailing schooners which were common during the boom years were abandoned for larger steam powered vessels which could haul the huge amounts of iron ore which poured from the mines. Iron ore, grain and commercial goods soon became the staples of the Great Lakes shipping industry. Large lake freighters, ore carriers, tugs and barges replaced the trim but outmoded sailing vessels. Improvements in vessels, communication, and safety regulations reduced the occurrence of shipwrecks throughout the twentieth century. Today wrecks are scarce, but as the recent loss of the Edmund Fitzgerald has vividly demonstrated, people still cannot control the anger of the Inland Seas.

The entire history of the Great Lakes can be traced through its many shipwrecks. Numerous vessel types have sailed the Lakes, including schooners, brigs, barks, ketches, whalebacks, freighters, scows, tugs, yachts -- the list is endless. Each vessel type had specific functions, advantages, and capacities which made it technologically unique. Likewise, each vessel and every sailor had their own life with times and places far removed from us today. Unfortunately, little is known about the vessels and the crews which helped to make our nation and our state what it is today. The people who sailed the ships, as well as the vessels themselves, can be rediscovered by careful scientific investigation of the artifacts remaining in underwater environments, but disturbing these clues to our past will limit what can be learned. Three hundred years of our heritage now lies below the cold, fresh waters of the Great Lakes. These ships represent not only our past but also our present. They are illustrative of the dreams, goals, accomplishments, and failures which have molded both ourselves and our nation.

CONCEPTUALIZATION OF PARK-PRESERVES

In order to manage a given resource, whether it be natural or cultural, the first step is to obtain a clear picture of both the resource base and the basic concepts to be used in a management program. Underwater cultural resources in the Great Lakes such as shipwrecks are important and non-renewable. They need to be evaluated, protected, and managed efficiently. Numerous methods for management have been attempted in several states with varying degrees of success. One method which has been suggested is the establishment of underwater preserve areas with well defined boundaries

and management guidelines. This report advocates the establishment of preserves in the Great Lakes, and offers suggestions for future management programs involved with cultural resource evaluation, protection, and interpretation. In addition, we recommend that underwater parks be combined with historical preserves, whenever feasible, in order to fully utilize the resource. Parks should not necessarily be combined with preserves in every instance. However, the park-preserve concept is both feasible and practical and should be developed in at least one area of Michigan's waters.

The historical park-preserve concept in Michigan and across the nation is not new. For many decades, parks have been centered around historic sites for the purpose of providing recreational and educational opportunities to the public. Historical interpretive parks such as Fort Michilmackinac, Fort Mackinac, Colonial Williamsburg, and many others offer a unique opportunity to learn about this nation's history and development, while also providing a means for outdoor recreational activities.

Underwater park-preserves could provide similar opportunities for recreation and education. Shipwrecks could be explored by divers and interpretive programs, and could provide information on Great Lakes seafaring history, economics, etc. Concurrently, these vessels would be protected by law. For example, the park-preserve concept provides divers with the facilities for recreational diving, while assuring the preservation of shipwrecks for future generations of both the diving and non-diving public.

This concept has been applied with great success to an area in Lake Huron's Georgian Bay located about 70 miles east of Alpena, Michigan in the Province of Ontario where the Canadian government has established a provincial park. Called Fathom Five, this park was created to protect a large concentration of shipwrecks and to serve as an area for outdoor recreational activities. An estimated 250,000 non-diver tourists visit Fathom Five each year (Warner and Holecek, 1978). A similar park-preserve in Michigan's waters could benefit the State's economy¹ via increased tourism. This type of park-preserve would hopefully

¹In a recent survey of scuba divers residing in the Great Lakes region, it was found that on average they spend about \$300 per year on diving trips and own an average of \$600 worth of scuba equipment (Holecek and Lothrop, 1979).

draw large numbers of both divers and non-divers, through a combination of land-based recreational facilities, interpretive centers, museums, and diving opportunities.

Shipwrecks are not the only type of underwater cultural resource that should be recognized as such. For the purpose of this report, archaeological resources can be defined as "objects or material of every description, or parts thereof, which are illustrative of and relate to the history and cultural heritage of Michigan or the nation as a whole." Pilling (1977) notes that there are seven major types of resources which may occur on the bottomlands. These are 1) shipwrecks, 2) items from a shipwreck but not attached to it, 3) items dropped or thrown from vessels, 4) pilings of former fishweirs, docks, wharfs, dams, etc., 5) items dropped or thrown from docks or wharfs, 6) bottomland dumps, and 7) former dryland sites that are presently wholly or partially submerged. This latter category includes all types of prehistoric or historic sites.

Each of these seven major classifications constitutes a potentially valuable resource which could be of interest to the professional archaeologist, and ultimately the general public. Each category has special attributes which require individualized attention in order to assess its value as a cultural resource. Therefore, underwater preserves may be formed around any or all of these seven types of resources. On the other hand, park-preserves would most likely be formed around concentrations of historical shipwrecks. Shipwrecks offer a wider overall appeal and are much more readily interpreted to the diving and non-diving public. This report, therefore, emphasizes shipwrecks, although it is important to bear in mind that all types of cultural remnants have great value as historical and archaeological resources.

There are six fates which can befall a shipwreck in the Great Lakes. These are: 1) be preserved, 2) be preserved and developed, 3) be developed, but not preserved, 4) be destroyed by people, 4) be destroyed by nature, and 6) remain undiscovered. The first four options are within our control and are, indeed, frequently selected by various specific interest groups.

Fates #1, preservation, and #2, preservation and development, are highly desirable since they represent the interests of the widest cross section of the general public. Preservation and future research add to our knowledge of history, anthropology, economics and other topics. Preservation coupled with development and re-

search is even more beneficial as it includes actual use of the resource. With carefully planned resource development, a large section of the population can be reached, including scholars and the diving and non-diving public. Underwater park-preserves would not only benefit small special interest groups but would provide research and recreational opportunities which are unique to the Great Lakes region. Preservation and development would provide the greatest benefits to the widest cross section of our population to include present as well as future generations.

Options #3 and #4, on the other hand, would both eventually result in the destruction of the resource base and benefit only a few individuals from special interest groups. Although either could perhaps greatly benefit a few individuals, both endanger the survival of the resource. Removal of shipwrecks by well equipped salvage operators is probably the greatest short term threat to Michigan's shipwrecks. But, development, without effective preservation can, in the longer term, be equally disastrous for these resources. Thus, simply designating areas as underwater preserves and banning commercial salvage in them is not enough to insure their survival since the selfish and/or thoughtless small destructive acts by sports divers and vandals can result in destruction of the shipwreck's value for historical and recreational uses.

Great Lakes shipwrecks are different in many respects from those found in other parts of the world. The Lakes cold fresh water is an exceptional preservation medium, and it is not uncommon to find wrecks in excellent condition even after decades of submersion. Another unique aspect of these wrecks is the extremely low probability that they contain any form of conventional "treasure" such as silver and gold. Whereas states such as Florida and Texas are known for treasure trove wrecks, this is not the case in Michigan where shipwrecks containing lumber, grain, or iron ore do not have the same financial or aesthetic appeal. This explains why Michigan does not have the large number of well financed treasure hunters who operate in the gulf states. Also, the Great Lakes lack many of the attractive natural resources found in other areas where underwater parks have been established. In Michigan, shipwrecks are commonly the prime attraction for scuba divers although some interesting geological formations and fish concentrations are also found in the Great Lakes.

All these factors place Michigan and other Great Lakes states in an unusual position. In Texas and Florida the state governments have recognized the financial assets of shipwrecks and have passed stringent controls concerning the salvage or destruction of wrecks. The motive for controls was likely not due to historical awareness on the part of the state legislatures, but rather the clear economic gain in dollars and cents. In Michigan, however, while the historical value of wrecks is clearly demonstrable, their economic value seldom arise from the cargoes they carried. Great Lakes shipwrecks are more subtle in economic value² since they are indirect resources which generate wealth through attracting recreational and tourist dollars. The present and potential value of tourism coupled with immense archaeological value suggests that shipwreck preservation and management is the preferred course of action in most instances.

EVALUATION OF POTENTIAL PARK-PRESERVE AREAS AND ESTABLISHMENT OF BOUNDARIES

Having presented some of the considerations supporting the establishment of preserves and park-preserves, the next stage is to evaluate potential areas to include in the preserve and park-preserve system. In order to establish effective management programs, boundaries should be established which clearly delineate areas which are practical in size. These boundaries should be drawn so that they encompass major concentrations of shipwrecks and other cultural resources, yet create an area which is small enough to be patrolled and enforced without excessive cost.

Ideally all significant cultural resources which lie on the bottomlands of the state should be protected. In Michigan, the state with the largest fresh water coastline in the U.S., protection of all shipwreck resources is virtually impossible given current enforce-

²Most older wrecks were either salvaged by their original owners where economically feasible or were abandoned. More recent shipwrecks which have not been abandoned by their owners would not be available for protection since the state does not have ownership. Materials salvaged from shipwrecks have been and continue to be marketed. It appears that this market is based upon the curiosity value of owning a piece of an old shipwreck, and the volume of business and profit involved is quite small.

ment capabilities.³ In addition, at the present time, there is no legislation which confirms the state's jurisdiction over bottomland resources and assures legal sanctions against individuals who destroy these resources. Whereas regulatory legislation will probably soon be adopted, it alone will not assure shipwreck protection. Enforcement will be enhanced if the areas to be protected are appropriately selected and if the public is made aware of and accepts the need for such enforcement.

From a practical standpoint, the establishment of small, well-defined management zones in selected areas would greatly facilitate the protection and enforcement aspects of the preserve program. The major problem with this option is that the areas outside these zones would be unprotected and individuals who possessed the necessary equipment and technology could destroy valuable resources. Fitting (1978) notes this dilemma but favors the management program which covers and completely protects resources within limited zones.

The construction of boundaries around limited management zones should be based upon several criteria, the most important of which are the type, frequency, and condition of the cultural resources present in a specific location. Boundaries should encompass as many resources as possible, and these resources should be of the highest quality and condition available. Quality and condition are generally more important than frequency, although no hard and fast rule is applicable in this respect. A review and computerized analysis of historical documents by Wright (1972) pertaining to shipwrecks is especially valuable in the preliminary evaluation of proposed preserved areas. Wright's study utilizes various historical sources such as vessel enrollments and regional newspapers to obtain data on and approximate location of wrecks. A scan of these sources revealed 1,318 recorded shipwrecks in Michigan's waters. Only those vessels over 45 feet in length were investigated.

Several problems exist in Wright's study. The first of these is an acknowledged "information gap" on the period prior to 1850, which reflects gaps in historical literature. Another problem is the lack of

³The problems faced by those charged with protecting shipwrecks are, however, not unique to these resources and should not be considered as being insurmountable. For example, many of our national and state parks were established to protect unique natural resources although complete protection was impossible to guarantee.

data on the exact location of wrecks, which is, again, a result of inadequacies in the documents which were reviewed. Although this study can provide only rough parameters of the number and location of shipwrecks in the Great Lakes, it is an important first step in outlining the resource base. When combined with known locations of shipwrecks as well as with other historical documentation on transportation routes, a more accurate view of shipwreck concentrations (see Figure 1) around which tentative boundaries could be drawn. The areas thus created would be of manageable size and would be near land bases or shorelines which could serve as headquarters for enforcement operations and for other land based facilities such as interpretive centers. These areas would form the core of Michigan's park-preserve system.

Determining the location and extent of major wreck concentrations should be one of the high priority items of a long-range management program. Boundaries should be flexible enough to allow for modification as new information on the resource base is gathered. Individual divers can be especially helpful in providing information about wreck locations. Due to fear of overregulation by the state, however, many divers are unwilling to divulge information concerning "their" wrecks. Hopefully, these fears can be allayed and divers will become more willing to provide valuable input on shipwreck locations. As we obtain more complete data from historical sources, archaeological surveys, divers, fishers, salvors, etc. the task of selecting park-preserves will be more efficient. At this time, those areas noted in Figure 1 appear to be the most promising for consideration as park-preserves.⁴

In addition to type, frequency, and quality of resources, factors such as resource value, potential conflicts with other uses of the area, water depth and visibility, presence or absence of currents, proximity of medical facilities, and economic impact on neighboring communities should be considered when selecting park-preserve areas. Environmental factors such as impact on fish breeding grounds as well as

⁴There are at least three potential problems with selecting these areas without further investigation. First, the historical documents utilized to develop them generally provide only rough approximations of wreck locations. Second, historical information gaps exist which suggest that at least some shipwrecks were not included. Third, the condition of the wrecks is not known. Clearly, verification of shipwrecks' presence and condition would be a prerequisite for park-preserve designation.

recreational considerations such as sport diver and boater activity should also be analyzed.

The novelty of this type of facility will require development of new design and management strategies. We recommend beginning with the selection of a single area of shipwreck concentration as an underwater park-preserve with the careful study and monitoring of possible impacts on the resource and its environment. If no serious problems arise during the study period then more parks could be created at later times. This approach is economically reasonable in that costs would be distributed over a period of years while minimizing the risks of expensive mistakes. Using one area as a test case of the underwater park concept, divers and archaeologists could carefully monitor and evaluate any impact on the resource.

A likely candidate for the first underwater park in Michigan's waters would be a shipwreck concentration lying in Thunder Bay off Alpena County. This area was investigated through a diving survey and is reported to contain at least 26 shipwrecks (Warner and Holecek, 1975). A review of the wrecks indicated that they range in date from the early nineteenth century to the present. These shipwrecks, many of which are well preserved, constitute valuable historical resources.

Michigan's underwater parks would probably be administered by state of Michigan agencies, but federal and even local governmental agencies could be directly or indirectly involved in the program. The U.S. Park Service, for example, is actively managing the excellent collection of shipwrecks contained within the boundaries of Isle Royale National Park although this park's shipwrecks were not instrumental in establishing the park. State government, nonetheless, appears to have been cast in a lead role with respect to underwater park establishment and management in Michigan but there appear to be opportunities for gaining much needed support from the federal government. Three federal programs which might provide support are: NOAA's Marine Sanctuary Program, the National Register of Historic Places and the Land and Water Conservation Fund.

The National Oceanic and Atmospheric Administration (NOAA) administers to Marine Sanctuaries Program under the authority of the Marine Protection, Research, and Sanctuaries Act of 1972. Title III of the Act states that NOAA may designate ocean areas as sanctuaries "for the purpose of preserving or restoring such areas for the conservational, recreational, ecological,

or esthetic values." Sanctuaries can be designated in the Great Lakes as well as the marine area of the continental shelf. There are five types of sanctuary areas:

HABITAT AREAS for the preservation, protection, and management of essential or specialized habitats representative of important marine systems. Management emphasis in such areas will be toward preservation.

SPECIES AREAS for the conservation of genetic resources. Management emphasis in such areas will be to maintain species populations and communities for restocking other areas and for re-establishing species in the future.

RESEARCH AREAS for (a) scientific research and education in support of marine management programs, and (b) providing ecological baselines to compare and predict the effect of man's activities and to develop understanding of natural processes.

RECREATIONAL AND ESTHETIC AREAS for the protection of important and valuable recreational waters. This especially includes those waters and seascapes adjacent to existing parks, national seashores, or their equivalents, and areas for recreational fishing and SCUBA diving.

UNIQUE OR EXCEPTIONAL AREAS for the protection of unique or nearly one-of-a-kind geological, archaeological, oceanographic, or living resource features. (Childress, 1978).

The last two sanctuary types listed seem relevant to Michigan's underwater resources. The primary benefit of the NOAA Program is that federal funds can be made available for the projects, while providing state agencies complete control and management of the resource.

In order to qualify for the NOAA Sanctuary Program, several criteria must be met including, a detailed written report outlining the area, impacts, resource base, management, and enforcement. A preliminary diving survey to locate and record shipwrecks is essential to a description of an area's resources. At the present time, only the Alpena/Thunder Bay area has been surveyed to such an extent that the number and position of shipwrecks is well known. In order for other areas to qualify for the Sanctuary Program, more detailed surveys of cultural resources must be undertaken in the Great Lakes.

A second potential federal source of support for establishing underwater historical preserves is enrollment on the National Register of Historic Places. This register is the official list of the nation's cultural resources worthy of preservation, protection, and funding by the Advisory Council on Historic Preservation. Its legal basis rests on the National Historic Preservation Act of 1966 and Executive Order 11593.

Shipwrecks could be placed on the National Register either individually or grouped into a "historic district". Placement on the register is dependent upon a number of criteria such as historic value, aesthetic properties, etc., and must be thoroughly documented as to importance. This again would require archival research and an archaeological survey in order to document and pinpoint individual shipwreck locations.

The following criteria are used in evaluating potential entries for the National Register. "The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, expressiveness, feeling, and association, and: (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or (b) that are associated with the lives of persons significant in our past; or (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a distinguishable entity whose components may lack individual distinction; or (d) that have yielded, or may be likely to yield, information important in prehistory or history."⁵ Shipwrecks in the Great Lakes possess all the characteristics required for placement on the National Register.

Shipwrecks in Texas located within a large National Register District encompassing numerous vessels, have been placed on the National Register (Arnold, 1977). Such districts could be constructed and documented in the Great Lakes in order to protect and preserve cultural resources.

⁵ (From 36 CFR Part 60, Section 60.6) For further information regarding the National Register of Historic Places contact the State Archaeologist, State Historic Preservation Officer, or Secretary of State. Review of the 1966 Historic Preservation Act and 36 CFR Pt. 60 will provide an outline of eligibility for the register.

In addition to the NOAA and the National Register, recreation monies such as Land and Water Conservation Funds could provide support for areas where recreation was deemed desirable. The benefits of combining two or three methods which complement each other are: 1) the resource base would be protected on both the state and federal level, and 2) the base for funding opportunities would be diversified. If each agency responsible for cultural resources could provide a portion of the total necessary funding, then costs would be greatly lessened to all parties.

Once tentative boundaries for potential park-preserves are established, a thorough survey of these areas should be undertaken in order to determine and evaluate their resources. During the survey period a ban on any type of salvage operations should be placed into effect until the resource base is fully explored and documented. If support is to be sought from the NOAA Sanctuary Program or the National Register of Historic Places, at least a rough survey should precede preparation and submission of application forms.

A detailed survey of an underwater area should be conducted in four stages.

Stage 1 - Historical Resource Survey

This stage involves the use of historical documents to establish the location or approximate locations of recorded shipwrecks. Information such as the history of vessels and vessel types, shipping patterns and trade routes, and many other topics involving economic and social history, demography, and anthropology, should be collected and reviewed. Wright's (1972) survey of documents provides a good beginning. Several museums and libraries in the Midwest also have large collections of historical documents concerning Great Lakes history, and these sources should eventually be reviewed by a qualified historian.

Stage 2 - Diving Survey

Many sport divers in the Great Lakes Region have knowledge concerning the location and condition of many shipwrecks. A list of divers could be informally obtained from dive clubs, dive shops, and charter boat services. Those divers who wish to volunteer information about a given area could be contacted and interviewed. This procedure could result in the location of many or all known shipwrecks in an area. A diving survey could be initiated then to evaluate each known wreck as to vessel type, condition, cargo, depth, and diving

conditions. Since this type of survey would utilize volunteer divers, it would be relatively inexpensive to perform. Local historians, fishers, and other individuals could also be helpful in the pinpointing of shipwrecks and should be contacted if possible. Although shipwrecks appear to be the most promising rationale for the development of underwater park-preserves in Michigan's Great Lakes, geological formations also may be of interest and should be inventoried.

A shipwreck reconnaissance conducted off Alpena County in June, 1975 is a very good example of an initial diving survey. This project was designed to pinpoint the location of wrecks within the Alpena concentration defined by Wright, and to determine their condition. The survey utilized volunteer divers and a charter vessel. Divers also investigated and recorded information on the area's geological formations and fish life. This type of project could accumulate enough information for NOAA and National Register applications, and is a good preliminary step towards a complete inventory of resources.

Stage 3 - Remote Sensing Survey

After known shipwrecks are located and mapped, a remote sensing survey should be performed in order to locate unknown, buried, or fragmentary sites. Proton magnetometers, side scan sonar equipment and sub-bottom profilers could be used. The magnetometer, in particular, has been used by archaeologists with great success in locating unknown wreck sites (Arnold and Clausen, 1975). This instrument measures the earth's magnetic force and delineates anomalies caused by ferrous substances. Ship anchors, engines, or rigging would create such an anomaly and could be detected by the magnetometer.

Sonar equipment and profilers operate on different principles and detect the bottom's contours. They also can locate shipwrecks although the magnetometer is probably more efficient. Other forms of remote sensing such as satellite photography may also be useful in locating shipwrecks in the Great Lakes although this method has not yet been demonstrated to be effective. Such sophisticated equipment should be operated and the information which is collected interpreted by qualified people with training in underwater archaeological survey techniques. Many individuals and organizations specialize in this field and bids could be let on these surveys. Equipment could also be purchased or rented if personnel and a vessel were available. Rental costs would be approximately 1,200 dollars

per month while purchase costs would be around 200,000 dollars (Hudson, 1978). Within the Great Lakes region several state and federal agencies have access to remote sensing equipment, and loans or rentals from these sources may be possible.

Stage 4 - Final Diving Reconnaissance

After the data from the remote sensing survey has been analyzed and interpreted the anomalies which were located should be investigated. This would be done through diving reconnaissance at the site of the anomalies. In some cases, excavation may be necessary although in most cases a simple diving preview will suffice. With the completion of these four stages, all resources within a given area would be located and information as to their condition, type, etc. would be known. Depending on time, funding, and availability of equipment and personnel, some sampling of proposed areas may be necessary. Ultimately, however, all areas should be completely surveyed through all four stages.

As each shipwreck or resource is discovered, site reports should be recorded and placed in both the State Site Files in the History Division and in the site files at the University of Michigan. Site numbers should also be assigned to each wreck according to procedures for above water sites with the exception that an underwater designation of some type be included. The sites could be filed under the nearest county. Such information as the exact location by longitude and latitude (or Universal Transverse Mercator), the condition, size and type of the vessels, cargo, diving, conditions, nearby geological features, etc. could be recorded, and, at a later date, computerized to facilitate retrieval.

The information which is collected by the survey process should not be indiscriminately released to the public. Some restraint should be exercised to assure that the exact location of shipwrecks is protected until management-protection schemes have been developed. Enforcement problems would become unmanageable if the location of the sites became known prematurely. Wright (1972) also notes this problem and recommends that data on individual vessels, and requests for such data, be

channeled through the appropriate office (Underwater Salvage Committee) of the state regulating agency.

Once the survey of preserve areas is completed each individual shipwreck (or other resource) should be individually evaluated by professionals (archaeologists, historians, recreation planners, geologists, etc.) as to its historical/cultural and recreational values. The criteria used for evaluation of cultural resources would be similar to that used for nomination to the National Register of Historic Places. Some of the more important features which would be used in wreck evaluations include:

1) Resource Age - Any resource which is older than 50 years should be considered historically valuable. The Great Lakes region was settled and developed by Europeans relatively late in time, and records and documents about many aspects of the region were not kept in a systematic fashion until well into the nineteenth century. While many states recognize resources only predating the twentieth century, this time range would be far too late in regards to Michigan. The National Register, Park Service, and most federal agencies recognize the 50 year time limit for resources and this could be used efficiently for underwater cultural resources in the Great Lakes as well. In addition, some shipwrecks or resources may be of historical value although they have not yet attained the age of fifty years. For this reason, shipwrecks should be evaluated on several criteria rather than on one single aspect such as age.

2) Resource Scarcity - One of the primary criteria used in the evaluation process should reflect the frequency of resources within defined categories.

⁶The Underwater Salvage Committee consisting of representatives from DNR, the Department of State's History Division and non-government employees is charged with policy making for underwater resources. Contrary to its name, this Committee's charge is to establish policies to protect the interests of all citizens of the state in resources and not, as the name implies, to promote salvage operations.

Shipwrecks, for example, can be grouped into numerous vessel types based upon size, rigging, function, etc. Those vessel types which occur less frequently than others should be considered somewhat more important, although no clear cut rule exists. A shipwreck which is old and which is also unique or rare within an area should be ranked higher than a similar vessel of common occurrence, if no extenuating circumstances are present. The analysis of cargo, and its possible historical value, should also be taken into account. A common vessel type may have been carrying an unusual type of cargo, which would make the entire vessel more important than had it been hauling a common cargo. The various elements of a wreck site such as vessel type, cargo, nationality or ethnic origin passengers or crew, etc., must be considered together to present a complete overview of the resource and its overall role in the development of the region.

3) Condition of Resource - Condition is important because it often is synonymous with the amount of information which can be derived from a resource. Certainly more data can be gathered from a complete shipwreck than from a similar but fragmentary one. Again, condition should not be the sole determinant of value unless vessels are identical in all other respects. A great wealth of information is often gleaned from a fragmentary shipwreck by archaeologists. For the most part, the shipwrecks investigated are usually in relatively poor (fragmentary) condition.

These above three considerations, therefore, constitute the major criteria for assessing underwater cultural resources in the Great Lakes. These factors result in a system by which resources could be evaluated and ranked in order of priority. For example, in the following table the three criteria are presented along with their relative historic values.

<u>Resource Age in Years</u>	<u>Scarcity of Resource</u>	<u>Condition of Resource</u>	<u>Historical Value</u>
Less than 50	Very common	Very poor	Low
50 - 100	Common	Fair	Low - Medium
100 - 150	Average	Good	Medium
150 - 200	Scarce	Very good	Medium - High
200 - 300	Very scarce	Excellent	High

The combination of less than 50 years of age, very common occurrence, and very poor condition would rank a resource at the lowest value. Inversely, a resource with 200 to 300 year age, very scarce, and in excellent condition would rank the highest. In this hypothetical system of rank, 125 combinations would be possible, and resources could be ranked within these positions.

A ranking of known resources is important when considering protection measures, development plans, etc., in order to assure optimum utilization of the resource base. The only drawback to a ranking system is that it is arbitrary with respect to the scarcity value, since it is the responsibility of an individual or group of individuals to determine relative scarcity importance. This would not pose a problem if qualified individuals were involved in the ranking process. Based upon position within the ranking system, resources could be further grouped into general categories of importance and different management programs could be directed towards each stratified set. The value of wrecks as recreational resources would also be weighed and appropriate management recommendations could be directed towards this aspect of the assessment scheme.

Underwater preserves are of no value if they cannot be protected both legally and physically. The legal aspect of protection is especially important in that it forms the foundation for any program by establishing penalties for violation of the law. According to McGimsey (1972), two precepts must be accepted by the courts to protect archaeological information and materials. These are:

- 1) The Public has a right to the historical and scientific information contained in archaeological sites, and therefore no individual has the right to act in a manner such that this public information is needlessly destroyed.
- 2) The police powers of the state can be exercised to safeguard this aspect of public welfare.

If these two statements are not accepted by the courts then protection of cultural resources can be effected by indirect means only such as laws prohibiting vandalism, destruction of state property, grave robbing, etc. Any state legislation for the protection of underwater cultural resources will most likely set penalties for illegal salvage or destruction of wrecks. Past proposed bills have set penalties

of fines of up to 1000 dollars and imprisonment of up to one year, as well as confiscation of salvage property. It is unlikely that more stringent penalties would be adopted into law.

If legislation is not passed or if the courts do not recognize the need for cultural resource protection, then indirect methods of enforcement must be utilized. However, these methods can be used only if the state has clear legal claim to resources on the bottomlands or if preserves are established through some means such as the NOAA Marine Sanctuary Program. Test cases in the courts and the establishment of legal precedents governing the Great Lakes will be the final factor in the protection process.

Once the legal aspects of the protection of cultural resources are resolved, an enforcement program can be implemented. This protection can take various forms and can be initiated in numerous ways. Since no single form of law enforcement will likely be totally successful, several potential protection and management schemes will now be discussed.

1) Use of the charter boat system - this system has been successful in several states including Florida. It focuses on the licensing of charter boat operators working in preserve waters. Access to preserve areas for diving purposes could be restricted entirely or primarily to vessels which were licensed as charter boats. The boats would operate in a free market economy where they could compete for services and establish their own prices. It would be the responsibility of the boat owners to make sure that no materials were illegally salvaged from vessels lying within preserve waters. If boat operators participated in illegal salvage operations, they would lose their licenses. This economic sanction would deter illegal operations in most cases. Spot checks by undercover police/divers would be regularly used to insure the integrity of the owners. If an area were designated as a park-preserve, the volume of trade in dive boat charters would significantly increase. Although there would be opportunities for illegal salvage, the presence of other boats and divers within the general vicinity would somewhat deter salvaging. At the present time, several charter boats for divers are successfully being operated across the state. One operator and

businessman, George Tomasi, has noted the importance of assuring that wrecks remain in good condition (1979). If wrecks are vandalized, they eventually lose their appeal - and concurrently the charter boat operators lose their business. Boat owners, therefore, have a major economic stake in keeping wrecks preserved, and perhaps even in repair.

The charter boat system could form the foundation of a protection operation at minimum cost to the state. The collection of licensing fees from dive boat operators could offset a major portion, if not all, of the licensing administration costs.

2) Police Enforcement - Police enforcement must be an integral part of a protection scheme. The visibility of shore and boat patrols alone would serve as a deterrent to illegal salvage. Visual reconnaissance from shore, coupled with regular patrols would benefit both resource protection and boating and diving safety. If the charter boat system is used, police patrols will be needed to assure that all dive vessels entering the preserve areas are properly licensed. Vessel inspection on shore and in preserve waters could also be used to investigate possible salvage infractions. Used alone, outright police enforcement would be extremely costly, and would not deter all offenders from illegal activity.

It would be necessary for protection and enforcement officials to enforce strictly the laws since even small salvage operations can destroy a great deal of historical and archeological data. Pilling (1977) recommends, and we concur, that a cost analysis be undertaken to determine the expense of adequate police protection in preserve areas.

3) Diver Registration - Each diver would be required to register before diving in a preserve area. Such information as name, address, certification number, etc. could be collected in order to analyze various aspects of resource utilization. In addition, these names would be on file for review in cases of violations. Anyone convicted of wrongdoing could be barred from future use of the preserve areas. A minimal usage fee could also be assessed during the registration process and would result in increased funds for management and protection schemes.

Some areas of the preserve may be declared off limits to all divers and information on areas to dive, diving conditions, water temperature, etc. could be made available during registration.

4) Salvage Permits - It is recommended that absolutely no form of salvage be undertaken within preserve or park-preserve waters. Allowing small scale hand salvage, as has been suggested by some, would not only destroy the historical value of shipwrecks but also would open the door (in the public's mind) for larger salvage operations. Outside of preserve areas, some form of salvage permit system (such as the one currently used) could somewhat control the destruction of cultural resources. Within preserve areas, however, all resources regardless of age, scarcity, and condition should be protected to the fullest extent of the law. Some divers, of course, will complain about any type of restriction and regulations on salvage. These individuals probably represent only a small portion of the diving public. The basic premise upon which enforcement should be based is "that most divers, if properly approached and educated, will readily accept certain restrictions on their diving activity if they can see a reason for it, such as the preservation of knowledge for all the people of the state" (Albright, 1978). This philosophy has been proven true in South Carolina and other states and probably would apply to the Great Lakes region.

Since wrecks of relatively recent origin can provide potentially valuable information on our period of time, salvage on abandoned vessels should be held within legal limits. The patterns of today, in time, will be just as evasive as are those of the seventeenth, eighteenth, and nineteenth centuries. The heritage of the present must not be overlooked in the search for the past. Allowing the salvage of any vessel within the preserve areas would in effect bias the now intact sample of vessels which we have.

5) Education - In order for any preservation program to be successful, the public must recognize the need for conservation. Through a carefully planned program of education, the value of underwater cultural resources can be presented to the public so as to encourage preservation and historical awareness. Films, displays, written material, and public lectures can communicate this. Much of the destruction caused by individuals is based on a

lack of knowledge about cultural resources, as well as a curiosity about the past. The objective of educational programs would be to guide this healthy curiosity into beneficial rather than destructive channels. Programs could be developed to train divers as archaeological technicians who could assist in the location and recording of cultural resources. Many divers have a sincere interest in history, but lack the means by which they can make a positive contribution. Utilizing our knowledge of this region's rich heritage this volunteer force would not only reduce the destruction of resources but would also result in aid for scientific research. The mood in America at the present time is shifting towards an awareness that many resources are becoming scarcer and that the time to conserve is now. Hopefully, a program of education would channel those thoughts towards the area of cultural resource preservation.

A program at Michigan State University, which is administered by the Department of Parks and Recreation Resources, is currently educating the public about Great Lakes cultural resources. We recommend a similar, although expanded, program to be an integral part of the protection scheme.

In summary, the combination of these five methods would provide a relatively inexpensive means for resource preservation. This protection network could be applied to any preserves or park-preserves provided that proper legislation and funding was available. Through a combination of economic sanctions, police enforcement, registration and permit system, and education the valuable non-renewable resources of the Great Lakes could be protected.

As soon as preserves are created, the implementation of the management program can proceed. Funding, of course, is the limiting factor. There are, however, several basic needs which must be met to assure the protection and interpretation of the resource base.

An underwater park-preserve program is built on foundations in history and archaeology, as well as cultural resource management. The director of the preserve program should have primary training in underwater archaeology, seafaring history, and management. A staff position of State Underwater Archaeologist should be created. Many coastal states such as Texas, Florida and South Carolina have had similar programs for many years, and all are administered by underwater archaeologists. This position could be incorporated into the state's History Division and would complement the state-wide programs in archaeology and his-

tory that are already established. Other staff members such as archaeologists, historians, draftsmen, diving technicians, etc., as well as police and enforcement personnel, would also be needed to effectively conduct management programs.

Since most parks would also be used for recreational purposes, a park professional should be assigned to serve in partnership with the State Underwater Archaeologist. The park professional would be responsible for management of the recreational functions of park-preserves. This basic staffing model now exists in Michigan for land based historical parks and would appear equally desirable for underwater resources.

With the establishment of preserves and eventually park-preserves, a land base of operations nearby each preserve location will be necessary. These bases could serve as ranger stations, visitor centers and registration areas from which enforcement officials would work. Docking facilities and vessels would also be required for patrol operations and charter boat services.

At one park-preserve site, large visitor centers, museums, laboratories, etc. could be established as the control center for the entire preserve network. The cost of such a facility would depend upon the scope of the services provided. A large well-built and well-managed facility for research display and management would be an asset not only for the preserve program but also for many other related areas of study. That is, we suggest that a research center be established which would involve all facets of underwater cultural resources, including protection, historical and recreational research, archaeology, education, management and public relations. Such a facility could serve as a data gathering center for information on all facets of the Great Lakes seafaring history. A facility of this kind has been noticeably lacking in the Great Lakes region and would be beneficial to both researchers and the general public. Similar smaller scale facilities might be developed later if monies are available and the need is evident.

The land base could also serve as a visitor center for interpretive and recreational activities. Combined with hiking trails and picnic and campgrounds, the center could serve as the focal point for the nondiving public. It is imperative that

that interpretation of historical underwater resources be available to the general public rather than to divers only. This approach would generate greater historical awareness and hopefully lead to an increased desire for resource conservation and protection. It would also provide economic benefits to the region in which it is located.

A large land base of activity would also fulfill a very important role -- presentation of the resource to the public. Traditional museum displays combined with innovations such as films, video displays, and perhaps an actual vessel could be utilized to bring Great Lakes seafaring history, diving technology, and the overall development of the region closer to both divers and non-divers. Although the preserve and park-preserve concepts are designed primarily for the diving public, such a museum complex would be available to all members of the public. Other means of presentation such as glass bottom boats, underwater walkways, and underwater television should be evaluated for their feasibility as well. Although the latter may not prove to be technically or economically feasible, a museum facility would be relatively inexpensive if incorporated into a visitor center and could be open year round even though diving occurs primarily during the warmer months. A museum directed at Great Lakes history would be unique to the region and could become a major attraction in the state.

Presentation need not be restricted to the visitor center area only. Underwater resources could be interpretively displayed also. A combination of underwater trails, displays, and the actual shipwrecks could be used to educate the diver about vessel types, construction, and the historical background of the region. Underwater plaques and displays would be an attraction for divers to test their underwater abilities, while serving as a medium for conservation education. This underwater interpretive program would be useful at all preserve areas; however, due to prohibitive costs, it would be most beneficial in an area of high diver frequency such as an underwater park.

Underwater parks could also include diver skill test areas within park boundaries containing compass

courses, obstacle courses, etc. These facilities would serve several purposes. First of all, they would help divers to improve techniques such as low-visibility maneuvering, which would result in better and safer diving. Also, these training areas would occupy the divers' interests. Vandalism caused by sport divers often results from boredom. If activity areas could be incorporated into a park program, one possible side effect could be a reduction in vandalism.

A large museum facility could ideally house an entire sailing vessel, such as the schooner Alvin Clark which was raised and preserved several years ago. Such a vessel would be a unique interpretive item for a museum and could be used to demonstrate ship construction, ship conditions, and the everyday life of the seafarers. At the same time, the vessel would be preserved.

Although preservation is one solution to diminishing cultural resources, it alone is not enough. Before the opportunity for destruction arises, we should learn as much about the resource base as possible. This suggests ongoing research into the origins and remains of each resource which lies within designated preserve areas. Preservation alone will not reveal the processes of people which caused the origination, construction, and distribution of ships in the Great Lakes. Only research can shed light on these and other topics. Organized and directed by a professional underwater archaeologist, problem-oriented research projects could begin to unravel the many questions which lie hidden underwater. The goal of the research would be the examination and excavation of selected vessels which would shed light on the history and culture of past peoples. Pitting (1978) recommends similar research but suggests that certain vessels be set aside for strict preservation even from "scientific investigation" for a period of at least 50 years. This suggestion is well taken since the state-of-the-art in underwater archaeology is still in the infancy stage. Total preservation of selected wrecks from both divers and scientists would assure that no information would be destroyed due to imperfect techniques. However, research using the best state-of-the-art techniques must be undertaken if our knowledge is to progress.

Historical research, combined with archaeological investigations would benefit the public as a whole. Volunteer divers could assist in excavations to reduce the costs of a project, and the recovered materials could be analyzed and displayed within a research/museum facility. A conservation laboratory would be a necessary part of a research program and could also be incorporated into a ground base of operations. Through display, the publication of historical and anthropological books and pamphlets, and the experience of diving on actual shipwrecks, the public could benefit from both educational and recreational opportunities. At the same time preserves would protect a valuable portion of our nation's heritage, and through park-preserves would give opportunities for on site interpretive programs.

Recreation research should also be conducted in park-preserves because such facilities are relatively novel in the U.S. and especially in the Great Lakes. A wide range of research is needed to develop management strategies for enhancing recreational experiences at the areas while maintaining recreational values for future visitors. What is learned from studies at early park-preserves will serve to guide development and management of future facilities of this type.

SUMMARY

This report has briefly discussed a potential management scheme for underwater cultural and recreational resources in the Great Lakes. Though this has been only a rough outline of the problems and possible solutions which can be recognized, hopefully it will provide some suggestions on underwater cultural and recreational resource management which will be of future use. The creation of preserves and park-preserves in the Great Lakes is a concept that is likely to be implemented soon. The major recommendations suggested in this report can be outlined as follows:

1. Seven different types of cultural resources should be recognized in the Great Lakes. Shipwrecks constitute only one form of the resource.
2. Based upon the types of resources, preserves could be created by House Bill 4759, the NOAA Sanctuary Program, or by the National Register system.
3. The 12 areas of shipwreck concentrations outlined by Wright (1972) and DNR personnel would be good candidates for preserve and park-preserve areas, although other areas should be eventually included.
4. Surveys of these 12 shipwreck concentration areas should be undertaken in four stages.
5. Resources should be evaluated based on the major criteria of age, scarcity, condition, and recreational importance.
6. Resources within a preserve area should be ranked in order of importance to facilitate management schemes.
7. Resources should be protected through a combination of economic sanctions (charter boat service), police enforcement, registration and permit systems, and education.
8. A position of State Underwater Archaeologist should be created and should oversee the management of underwater preserves. A similar position should be created for a park professional to oversee the management of park-preserves.
9. One area should initially become an underwater park-preserve, and at that area a visitor center and museum should be established. Both above water and underwater interpretive facilities should be offered.
10. Resource presentation alone is not enough; without ongoing research the resource is of lessened value.

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