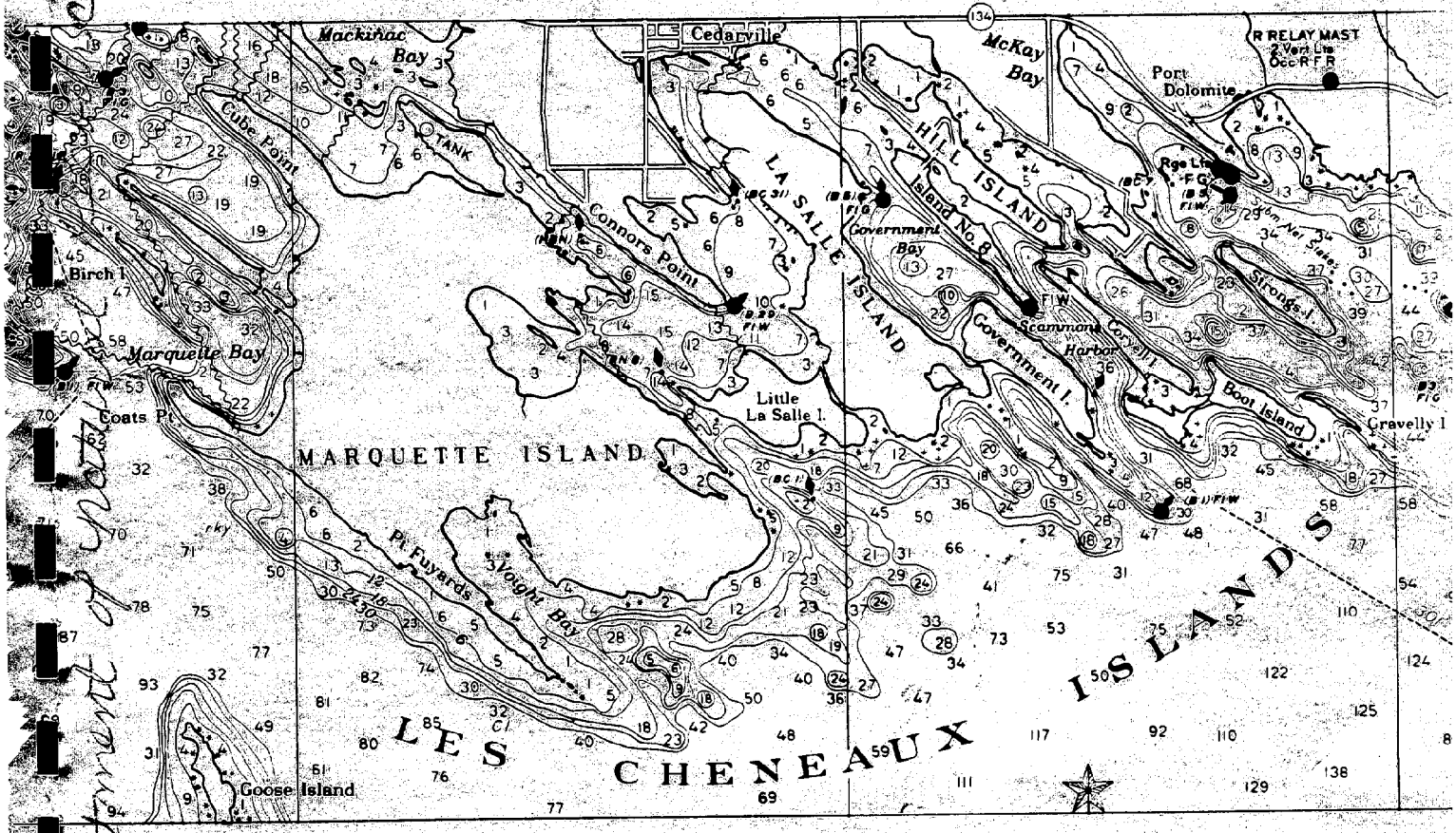

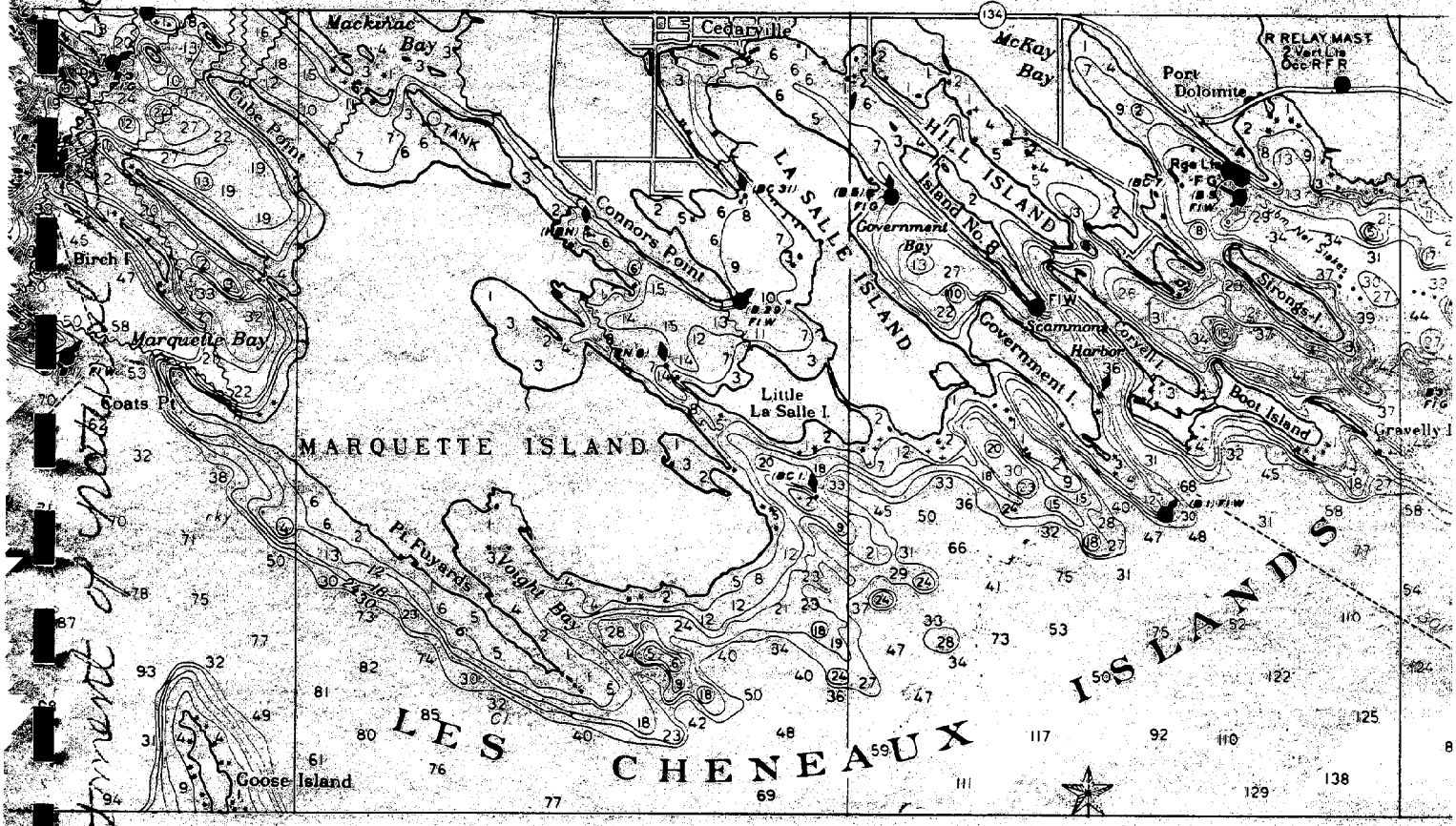

MANAGEMENT PROGRAM FOR MICHIGAN'S GREAT LAKES ISLANDS

Prepared by
JOHNSON & ANDERSON, INC
Consulting Engineers
2300 Dixie Highway
Pontiac, Michigan 48055

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PREFACE

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A. Intent of The Study

In January, 1980 the Coastal Programs Unit (CPU), within the Land Resource Program Division (LRPD) of the Michigan Department of Natural Resources (MDNR), initiated a study of Michigan's Great Lakes Islands. The objective of the study was to develop a comprehensive management program for the islands. That Management Program, as prepared by Johnson & Anderson, Inc. under contract with the MDNR, is presented herein.

The intent of this document though is more than simply a presentation of the Management Program. The study process utilized in during the Program development comprised a series of cumulative phases. The completion of each phase was required to accomplish the following phases. The five phases which comprise this study process are:

1. Data acquisition and review;
2. Development and analysis of island management issues;
3. Development of an island resource classification and ranking system;
4. Examination of management program options; and
5. Development of the recommended management program.

In order to provide a clear understanding of the study process and the resulting recommendations, the products of each of these phases are included. The products of Phases 2-5 appear as Chapters II-VI while the products of Phase 1 appear as the Appendices of this report.

Finally, it must be remembered that part of the justification for this study stemmed from a need to examine the issue of managing islands. Who is managing islands now or are they being managed at all? Is there a need for a uniform managment program? What would the benefits of such a program be? This study process endeavored to answer those questions and then use the answers to produce an appropriate and applicable island management program for the State of Michigan. The recommended management program appears in Chapter VI of this report and can be read independently of the remainder of

the document. In order to truly understand, however, the existing issues, tools, constraints and opportunities which shaped the recommendations, a review of the preceding chapters which discuss these factors is necessary.

PROBLEM STATEMENT

PROBLEM STATEMENT

A. What is an Island?

Definition: Is-land: a tract of land surrounded by water and smaller than a continent.

- DICTIONARY

"Well.....an island is a place of solitude, a place where I can escape the too familiar activities and unsolved problems and the day-to-day hassles of the mainland...."

- Drummond Island Second Home Owner

"I think an island can best be described as a retreat from the boredom of human activities associated with making a living."

- Annual visitor of S. Manitou Island

"An island?.....I'd say it offers me my livelihood, great fishing and hunting, and a sense of history of my family's beginnings. This island or...any island, is unique because it has its own cultural, historic, and day-to-day routine..."

- Beaver Island resident

"Islands are cliffs, quiet beaches, unlimited views, and freighters passing day and night...."

- Sugar Island resident

"Michigan's Islands? I never really thought about it except for Belle Isle and Mackinac Island. You mean there are other islands?"

- City of Detroit Policeman

"An island is something surrounded by water."

- Graduating college senior

B. Why Islands are Unique.

These sample comments concerning Michigan's Great Lakes Islands represent the knowledge, awareness, and understanding, or lack thereof, of many state residents. The fact is, the coastal islands of Michigan are truly a unique resource to the State of Michigan and the entire nation. While various state and federal island counts vary, it is estimated that Michigan has over

180 islands within its coastal boundaries. Many of these islands are currently uninhabitated, some partially developed, and some completely developed. Michigan's islands have drawn people for a variety of reasons since man first maneuvered log canoes to and around them to discover their resource bounties and the inland passage entrances which the islands guarded. Since that time, activities on the islands have ranged from the quarrying of building stone to sheep grazing; from storing timber to the defense of harbor facilities during all of this country's major wars; from illicit smuggling of nation-wide prohibited goods to providing respite to the nation's wealthiest of families; from storing of fishing nets to individuals foraging for daily food and shelter from nothing more than the island's natural resources. The history of human activity on Michigan's islands is no less rich and varied than each island's natural characteristics. Rare plants, numerous waterfowl species, gravel and sand beaches, exquisite wildflowers and edible fish, are but a few of the resources present on the state's islands. The waters about the islands support commercial and sport fisheries, recreational boating, and ecological research activities. Hearty souls have been, and are now drawn to the islands to lead independent lives supported almost solely by each specific island's resources and ambience.

Others are attracted to the sheltered beaches, quiet forests, sand dunes, and the spectacular vistas that islands provide to escape the anxieties and pressures of the "work-a-day, everyday" syndrome. A majority of Michigan's islands provide an aesthetic experience that is conducive to recreational pursuits and vacation retreats. In many instances, it is the shoreline in particular that is the focal point of these activities. Rocky cliffs, bird rookeries, quaint cottages, lighthouses and the constantly-changing condition of the water itself, from placid to violently stormy, all provide important and desired attributes. Michigan's island resources are unique in that there is a paucity of similar zones which exhibit the same elements. The rationale that underlies the "unique" description of islands is this: islands offer a more significant and more striking system of ecological, economic, and development opportunities than those that are common to the mainland coastal zone.

C. The Current Situation of Michigan's Great Lakes Islands.

In Michigan's coastal zone, the islands contain some of the best examples of the state's natural resources for wildlife habitat, recreation, scientific research, species propagation, and other public uses. Michigan's Great Lakes islands include nearly 430,000 acres of land with forests, mineral deposits, sand dunes, trout streams, wetlands, natural bird rookeries, historic structures, and unique plant life, much of which is steadily succumbing to the infringement of summer homes and related tourist service-sector development. This is especially true of the more accessible islands, principally those in the St. Mary's River chain, Beaver Island, the Thunder Bay Region, Potagannissing Bay, and Lake St. Clair/Detroit River Island Groups.

This should not be interpreted as meaning that the islands noted above are the only ones experiencing a problem. In fact, the real problem is how to avoid too-rapid or irresponsible development of the remaining islands. An appropriate question at this point is - will there be significant pressure for development of islands, for residential, commercial or industrial uses, in the near, or even foreseeable, future? Unless this pressure exists, concern for island management would be unnecessary.

To anticipate development pressure, one must determine what factors contribute to the attractiveness of island property for development: whether it be a residential, commercial or industrial use location and accessibility are critical. The extensive development of Grosse Ile undoubtedly can be largely explained by its location adjacent to the City of Detroit, and the presence of easily traversed bridges from the mainland. Yet if location and accessibility were the total answer then Beaver Island should not have experienced such extensive development. There is in fact considerable attraction to remote and relatively inaccessible (i.e., no highway bridge) areas, as Mackinac Island so capably testifies.

Islands such as North and South Manitou, Drummand and others are examples of the strong attraction that unique natural or geologic features provide.

Visitors and residents of these islands are willing to overlook distance from urban centers and difficulty in access for the pleasure and enjoyment of the island experience.

The real determinant which leads to residential development is therefore the demand for a unique living or leisure experience. The constraint limiting this desired experience would appear to be primarily a financial problem. If this is true then pressure for develoment of islands will increase as larger portions of income are directed at leisure pursuits; a phenomenon which has occurred in recent years. Trends in construction of second homes and retirement homes on Beaver Island support this theory.

Recognizing that larger portions of income are being directed at vacation homes and leisure activities, the pursuit of unique locations will certainly cause some islands to experience development pressure. This poses the problem of anticipating where that development pressure will occur. Exact predictions are unlikely but past patterns would indicate that islands in the vicinity of growing population concentrations, or possessing unique and/or aesthetic features have high potential. If easy access from the mainland can also be provided, the potential quickly increases.

The above discussion has only considered causes for residential development. Commercial development will likely follow residential development closely, or perhaps even attempt to anticipate it. Industrial development, in this instance primarily mineral exploitation, occurs wherever the raw material is found and exploitation and transportation of the raw material is economically justified. Discovery of valuable minerals on an island, or the rapid increase in a minerals value could result in rapid industrial development of islands ... if the minerals are there.

Lacking the ability to foresee where and when island development will occur, it is impossible to focus management and/or regulatory efforts precisely. Despite this, development will occur and at present there exists little knowledge or tools at the local level to ensure that this development does not seriously degrade a very unique resource.

Summary

According to historic and recent Heritage Conservation and Recreation Service data, the most heavily used beach facilities in the U.S. are within a two hour drive of an urban area and within a 1/2 hour boat trip. There are eleven (11) urban or mini-urban island access centers (Monroe, Detroit, Port Huron, Bay City/Saginaw, Alpena, St. Igance/Mackinaw City, Charlevoix, Leland, Sault Ste. Marie, Munising, and Escanaba (excluding Isle Royale). These areas have a combined population that total over seven million which are at or within a 50 mile radius of Michigan's Great Lakes islands. Because over 80 percent of Michigan's mainland shoreline is privately owned, the demand for the remaining 15-18 percent is significant. Thus, the Michigan islands represent a significant percentage of the relatively undeveloped, aesthetically fulfilling shoreline and resource potential of Michigan's Great Lakes coastal resources. According to HCRS data there are approximately 428,200 acres of coastal islands, of which 93,500 acres are developed. This means that given the liberal estimates more than one-fifth of Michigan's island resources are already developed. As development of the available mainland shoreline areas continues to accelerate and uses of these newly developed areas diversify, islands will increasingly represent desirable areas which up to now have seemed less accessible to vacation, commercial, and perhaps even industrial users.

It is apparent that the island resources of the State of Michigan are facing, or will face, severe development pressures. The growing demand for coastal zone and water-based recreational, commercial, and industrial opportunities indicates a need for planning and managing with the goal of protecting existing island resources. Planners and managers must carefully consider the short- and long-term effects of crowding and development on the nature and quality of the total experience and potential resources exhibited by Michigan's Great Lakes Islands. Michigan's Great Lakes Islands currently serve as the last bastion and legendary role as places of escape, living historic resources, wildlife sanctuaries...and as some of the most exploitable commercial resources in Michigan's coastal zone. While it is possible that they may survive these pressures without assistance, it would seem that prudent action, in the form of an implementable management program, is justified - perhaps even crucial.

ISSUES CONCERNING
MICHIGAN'S GREAT
LAKES ISLANDS

ISSUES CONCERNING MICHIGAN'S GREAT LAKES ISLANDS

A. Introduction

Michigan's islands are a scarce and limited resource. Because they were first visited and inhabited over 300 years ago, much of the land on islands close to trapping grounds, fisheries, forest, and mineral resources has been developed. Moreover, those islands within 2-5 miles of the mainland shoreline generally exhibit a greater percentage of development. Of the remaining islands that have historically been by-passed, some are rugged rock or marshlands that are not very suitable for either development or recreation. Other islands are of such ecological or natural habitat value that they are likewise not suitable for development. As was discussed in the previous section, there exists a great diversity of competing interests for the use of islands. In many instances, these interests are not only in competition but are of such a nature that pursuit of one specific use automatically excludes another. Some of the conflicts which exist concerning Michigan's Great Lakes Islands are discussed below:

- Islands offer some of the most attractive habitats for wildlife and supporting aquatic life. Such areas are subject to destruction by filling for development, construction of recreational harbors, channel dredging, and disposal of this dredged material. A critical problem is the potential for deterioration in species productivity and contamination of valuable breeding and spawning grounds. Such deterioration can result from development-induced impacts: increased storm water run-off, inadequate septic fields, and other waste influences.

- Much of Michigan's island coastline is not easily accessible to the public. Traditional avenues such as bridges, ferries, and marina facilities exist only on the larger islands such as Beaver, the Manitous, Drummond, etc. While this makes it difficult for the public to reach these sites, it also compounds the problem of monitoring use. Surveys of bridge crossings, ferry trips, etc. are not possible when those facilities do not exist. Thus, there is a problem of determin-

ing when the public uses an island, in what numbers, and what the impact of those numbers truly are. This truly complicates the consideration of providing increased access to islands.

- Mineral extraction (sand, clay, limestone, quarry stone, peat, etc.), while not currently a major activity on Michigan's islands, presents a dilemma to resource managers. Also, while published state geologic maps generally show only the mainland formations, the oil and gas rich Niagaran Reef extends under Michigan's Great Lakes and encompasses many islands. Of concern in this context is the extension into Lake Huron near Presque Isle and Alpena. According to personnel of the MDNR Geological Survey Division there exists a considerable potential for discovery of oil and/or gas in the near shore area. Therefore, it is possible that the Thunder Bay Islands could be used as extraction sites.

  Extraction of any of these resources is technically possible, though the economics of extraction are uncertain. Mineral extraction could result in subsidence, ground water contamination, and loss of valuable top soils, displacement of indigenous wildlife species, and loss of aquatic habitats.

  It should be noted that Natural Resources Commission (NRC) Policy No. 2304 does allow the granting of drilling permits for oil and gas wells on islands in International Boundary waters (comprising Lake Huron, the St. Clair River and the Detroit River) provided that they are not within 350 feet of the water's edge. NRC Policy No.2310 expressly forbids drilling on Michigan's Great Lakes bottomlands until such time as a national emergency exists.

- Demand has remained strong for primary and secondary-home housing on islands and the mainland coast. However, the majority of mainland home-owners must adhere to strict human and solid-waste rules and regulations. Enforcement is easier on the more accessible mainland shoreline. This is not always so on islands. Thus, septic systems, garbage/waste disposal, and general waste control measures are lacking

on Michigan's islands. This can and does lead to contamination of groundwater sources and the Great Lakes through run-off and groundwater flows, as has been noted on the developed islands in the St. Clair Flats area and portions of Beaver Island. Increased housing and commercial development attracted to the many accessible islands with available potable water supplies will certainly aggravate the existing waste disposal and contamination problems facing Michigan's developable islands.

- Islands present a particularly attractive site for development of vacation retreats, second-homes, retirement cottages, hunting lodges, etc. because of their relative isolation. As demand increases due to growth in population and development of mainland sites continues, available island shoreline will become increasingly sought after. It is possible to envision a future wherein the shoreline of Michigan's most beautiful islands is closed to the majority of the public.

- Debate on how to allocate regulatory authority over Michigan's Great Lakes Islands appears to hinge on two questions: Who is most capable of effectively managing the resource? Who will best guarantee that the interests of the citizens of the State of Michigan are served by the management program pursued? Michigan has a tradition of allocation of regulatory powers to local government through such legislation as local planning and zoning acts and the continued endorsement of home rule. In contrast, management of complex resource systems such as those found in coastal areas is oftentimes beyond the scope of local government abilities, and requires the involvement of trained specialists.

The best means of analyzing the potential island use conflicts discussed above is to divide them into categories which reflect exiting points of debate, conflict or controversy. As such, the categories are really issue areas: "interests in a state of controversy or conflict."

The following section will present six issue areas and provide a discussion of how that issue, or point of conflict, must be resolved by a management program.

B. Description and Discussion of Issue Areas

The following six issue areas are designed to include the range of conflicts which can, and will, arise over use of an island or its resources. It is the intent of the discussions to describe why potential conflicts might occur over certain actions. This understanding is of particular importance since a mangement program will undoubtedly involve mitigation and possibly mediation of conflicts.

Issue Areas

- Habitat and Natural Area Protection/Preservation
- Public Access Control
- Constraints on Waste Disposal
- Physical Development
- Decision Making and Regulatory Authority
- Resource Exploitation

Habitat and Natural Areas Protection/Preservation

Michigan's islands provide a unique set of resources unavailable on either land or water alone. The islands represent a wide variety of habitats for the propagation of wildfowl, fish, small game, endangered and threatened species, and others. According to data collected by the U.S. Bureau of Land Management (BLM) and Heritage Conservation and Recreation Service (HCRS), many of Michigan's islands are relatively small in size (83% under 20 acres) and because of this, have not as yet attracted significant human development activities. The two probable reasons for this are: (1) a majority of the islands are not easily accessible to, and known by, the general public, and (2) development is more costly on most islands.

It is apparent that the smaller islands are accessible to, and visited by, avid fisherman and some hunters who are willing to undergo the rigors and dangers of reaching the wetlands, spawning beds, and fishing grounds that naturally occur in and around some islands. Because these users are jealous of these areas, which they often consider their own, they rarely will pass on or publicly declare the existence of the islands and the bountiful resources to be found there. Furthermore, fishermen and hunters better recognize the fragility of the island habitats and tend to respect that the natural balance of these wetlands, beaches, and reefs must be maintained to ensure "next years catch."

In addition, because of the small size of many Michigan islands, the lack of developable land areas, and the time-consuming state and federal permitting procedures, many builders of second-homes and larger developments believe that development on islands is more costly than building in areas of the mainland coastal zone. While land values on many islands are low, the costs of transporting heavy equipment, building roads, transferring supplies, and developing drinking water and sanitary waste water systems, pushes development costs of island sites to or above mainland costs. Furthermore, the financial liabilities inherent to developing island sites is currently much greater than that for the mainland sites.

In the past, the two constraints mentioned above, have tended to protect most of the valuable habitats and natural areas inherent to Michigan's island resources. However, judging from the increasing number of building permits applied for in mainland coastal areas over the last five years and the addition of over 100 new boat access facilities, more and more mainland shoreline is being transferred into private ownership. In many instances, wetlands, beaches, and dune areas which provide productive habitat have disappeared forever. This requires that similar island habitats and natural areas provide support to displaced wildfowl, fish and game. Moreover, as more people move to, live in, and visit mainland coastal areas, the existence of many island riches will become better known and the islands will become more accepted as potential recreational and second-home areas. Also, as mainland coastal areas become overcrowded, more people will

appreciate the privacy and solitude that an island home or vacation can provide.

These pressures of uncontrolled development affect the natural environment, with adverse impacts on valuable water and land resources. Unfortunately, these pressures are occurring today. Attendant to these pressures is the potential degradation, deterioration, and final loss of the unspoiled habitats and natural areas found on Michigan's islands. The issue of habitat protection and natural areas preservation versus development is very broad and complex, but for purposes of this discussion, it will relate to the following specific topics.

- In the past, development on Michigan's larger islands has taken place on filled wetlands, dunes, and back dunes; such development has included primary and second home uses. This development, as well as the accompanying intensified recreational use, has resulted in alterations to natural habitats and destruction of soil binding vegetation. Loss of this binding vegetation facilitates increased the rate of stormwater runoff and the associated sedimentation of nearshore habitats. Loss of this vegetation also eliminates habitats for insects, snakes, and small fur bearers that are important elements of an island's food chain. Construction of coastal protection structures has resulted in adverse effects on shoreline and nearshore habitats because such structures produce higher nearshore wave energies and alter current speeds and direction. For these reasons, the capacity of wetlands, sand bars/reefs, beaches and sand dunes to serve as buffer to prevent storm damage and provide habitat has been reduced. While this situation is currently not common, those islands where considerable shoreline development exists such as Beaver Island do exhibit this trend.

- A second type of natural island area that currently is under intense pressure is island coastal waters, such as marshes, embayments, reefs, and spawning areas. Such areas are subject to destruction by filling for development, construction of navigation and access facilities, new

channel dredging, and disposal of excavated and dredged material. Personnel of the MDNR Wildlife Division have revealed a continued concern for the islands in the Detroit River particularly Celeron Island, which have been shown to provide critical habitat for migratory birds using this "flyway."

- The deterioration in productivity and contamination of valuable breeding and spawning grounds for many open water species is becoming more severe with development. Such deterioration is due to inadequate septic systems, inadequate solid waste disposal, run-off, and other influences, and can be observed on the developed islands in the St. Clair Flats area.

Public Access Control

The struggle for a place on the beach or in the coastal zone is a classic example of the dilemma of the "commons"; a common property resource in short supply subject to ever increasing demands due to burgeoning population growth and trends in modern living. This struggle is even more severe when Michigan's island resources are considered. The question of public access to island beaches and adjacent waters and to open space on islands is a critical component of the provision of recreational opportunities through Michigan's Great Lakes Islands. Many management and cost questions are raised in striving to permit safe and environmentally sound access to Michigan's island resources for all. Who will be able to use these resources? How are they going to get there? Who will bear the costs of access? The issue arises over access to the islands from a number of dimensions:

- Island areas useable by the public are finite and in limited supply and often not easily accessible to the general public. Moreover, increasing demand and location of the population in mainland coastal areas points toward increased pressure for access to Michigan's islands and their related public lands.

- Because of this pressure, there is at the same time increased informal (uncontrolled) access by trespassing across private property. This not only violates private property rights, but may cause heavier use of areas which perhaps should be protected or restricted because of their sensitive environmental nature. This protection or restriction is desirable in island areas where fragile natural resources exist or where hazards to persons exist.

- Because islands are a scarce amenity and because large portions of islands are held in private hands, access to the general public is not possible in many island areas.

- Each solution to island public access potentially changes the nature of property ownership and thereby property taxation. Thus, while providing greater public access and thereby incurring greater public maintenance costs, the potential loss of tax revenues must be addressed.

Constraints on Waste Disposal

Recent years have seen a growing recognition of the problems of solid wastes, hazardous wastes and sanitary wastes throughout Michigan's coastal zone. Given that the majority of Michigan's islands have bedrock characteristics that are generally unsuitable for septic fields and sanitary landfills, the questions of island vulnerability, waste control, and management are very pressing. Because many islands have shallow soils and poor drainage, the need to control and manage waste disposal on islands is critical. There must be increased recognition of the potential negative impacts both to habitats and to groundwater and surface water quality. If uncontrolled human development of islands is continued, many valuable, ecologically sensitive areas will continue to deteriorate and/or disappear.

Currently, the Michigan Department of Public Health is not involved with the review of on-site sewage disposal systems for individual lots unless the proposal involves the subdivision of land into five more more parcels.

Instead, all individual requests fall under the rules and regulations of local sanitary codes. Consequently, there is variation in site criteria and procedures from locality to locality. Moreover, because of the remoteness of many islands which will support development, it is difficult to control, monitor, and enforce these permissive standards. Thus, the potential for introducing unpermitted human sanitary wastes to island groundwaters is very high since the majority of development permits for islands are generally issued for single family dwelling units at the local level with no state review. Unless local island inhabitants complain about the lack or potential inefficiency of a proposed septic system or tile field, it is unlikely that the control of sanitary wastes will occur. This could lead to serious groundwater degradation and coastal water quality deterioration as the density of development increases.

Another problem critical to preserving Michigan's island resources is the control and management of solid wastes generated by island residents and users. At present, the solid wastes generated on developed islands is being disposed without the benefit of careful monitoring by health officials. While such islands as Beaver and Mackinac may have sufficient population concentrations to warrant a health officer, the smaller islands do not receive adequate attention. All past trends indicate that, unless they are so required, people do not dispose of wastes in a responsible manner. This results from lack of knowledge and/or the lack of a convenient place to safely deposit those wastes.

The absolute extent of this problem, and its location, will not be revealed until considerable research is conducted. It can, and must, be assumed that a problem does exist. If development of islands continues or increases, the problems of sanitary and solid waste disposal will pose grave threats to the unique and sensitive resources of Michigan's islands because of the inability of their geologic and soil characteristics to handle such wastes.

Physical Development

Present demands for development on islands are currently constrained because of the difficulties of access, and the high costs of mobilization and demo-

bilization of equipment required to develop islands. However, the demand for development of islands exists and results from the natural amenities of islands -- including scenic features, climate, resources present, and the lack of continuous state and local environmental oversight.

Crowding and development pressures are of critical importance and concern when one considers the conflict of preservation versus development in the coastal zone. Coastal resources are best and most meaningful at the land/water interface where they are most limited. As complete land/water systems, and because of their size and nature, islands are more vulnerable to the impacts of crowding, over-use, and development.

The Michigan coastal zone and coastal islands represent a scarce and limited set of resources. Because these areas have been developed within the last 50 or so years, much of the land close to the water has been or is being, developed. Of the more than 180 Michigan Great Lakes islands classified and ranked during this study, ninety-four are developed to some extent. For example, of the forty islands in Lake Huron that could be classified using HCRS and BLM data, twenty-five are developed. Specific breakdowns for the Lake Huron basin indicate that:

- All islands larger than 999 acres are developed - one island is 51-75% developed; one is 26-50% developed, and two are 1-25% developed.
- The only island between 500-999 acres in size is 1-25% developed.
- Of the thirteen islands which range in size from 100-499 acres; four are undeveloped; eight are 1-25% developed, and two are 26-50% developed.
- Of the nineteen islands of between 110 and 99 acres, ten are undeveloped; seven are 1-25% developed; and one is 26-50% developed.
- Of the three islands smaller than 10 acres, one is undeveloped; one is 1-25% developed; and one is 26-50% developed.

Since the Lake Huron data are generally comparable to the other lakes and attached water bodies, these figures indicate that islands in Michigan's Great Lakes waters represent significant development opportunities. Recognizing that the past demand for physical development of islands has been very real, there is truly cause for concern over the needs expressed by many environmental interest groups for preservation of islands for use and enjoyment by the public.

Resource Exploitation

Many of Michigan's larger Great Lakes islands contain timber resources and mineral deposits (dolomites, limestone, shale and salt). While only a limited number of islands are currently actively mined, the potential for increased mining activitiy exists and could result if mainland sites become scarce or unavailable. It should be stated at the outset that while some of Michigan's islands may have mineral and timber value, the probability of large-scale commercial development is very small in view of the current availability of the same minerals and timber resources on the mainland. Costs of moving equipment to an island, extraction, processing, and then transportation of the product, mined, quarried, or cut would be prohibitive.

According to information supplied by the MDNR - Geologic Survey Division, 15 islands are capable of supporting limited mining operations, primarily the extraction of sand for foundry operations. These islands include North and South Manitou and the Beaver Island Group. The anticipated designation of these islands under the Sand Dune Protection and Management Act (PA 222, 1976) will place strict environmental controls on mining activities, (obviously) reducing the potential for such actions. Despite this, the major constraint on island-based mining activities is economics.

The Geologic Survey Division also indicated that research efforts aimed at identifying exploitable limestone deposits have been successfully conducted in many areas, including the islands off the Garden Peninsula in Lake Michigan. Only Drummond Island in Munuscong Bay of Lake Huron, however, currently experiences active commercial extraction. It is unlikely that

exploitation will be initiated on other islands unless mineral values rise sufficiently to offset the high costs associated with working on islands.

Regardless of the actual probability of mining activities occurring, the level of concern among environmental interest groups is very high. This concern is based upon the fear that exploitation requires a severe disruption of the resource system with no guarantee that restoration and rehabilitation will occur. Even if regulations successfuly cause an area to be restored once exploitation is suspended, there is no assurance that the wildlife system that once existed will return.

Underlying this discussion must be the recognition that the resource characteristics of islands - fragile vegetation and natural habitats - impinge upon the issue of exploitation of island resources.

Decision Making and Regulatory Authority

There is no single level of government that can claim sole right to decision-making and regulatory authority over Michigan's Great Lakes Islands. Instead that power is shared by all three levels, State, local and Federal. It is this situation which contributes to the uncertainty over whether the islands are being managed in a consistant and responsible manner. Not only are the management responsibilities divided among a diverse group of agencies and officials, there are few opportunities provided for communication and exchange of information.

As a further complication of this situation, there is some debate over ownership of certain Great Lakes islands within the boundaries of the State of Michigan. This dispute concerns those lands which formed as islands within the boundaries of the State, after the State was admitted to the Union but before May 22, 1953, the effective date of the Federal Submerged Lands Act. As many islands, such as those in Saginaw Bay, have little elevation their virtual existence is a function of lake level. During periods of high water, the islands might be submerged, reappearing years later as the level of the lake declines.

It is the contention of some Federal agencies that islands which can be said to have originated during the time period noted above are owned by the Federal government. A legal opinion was prepared by the U.S. Attorney General's office regarding this contention. A review of that legal opinion was performed by the law firm of Booth, Patterson, Lee, Karlstrom & Stecking. It was their determination that the Attorney General's opinion could be interpreted as placing ownership in the hands of the State. A copy of that review appears in Appendix F of this report.

Unifying management authority in a single entity is as undesireable as it is unlikely. There are sound reasons for the division of powers between levels of government. It is necessary, however, to provide a program wherein all involved agencies contribute according to their expertise. Opportunities must exist where local interests and needs can be met while still protecting the interests of the greater state and national publics. An avenue for information dissemination is needed so as to provide for resolution of the inevitable conflicts. It appears essential that one of the involved groups assume a leadership role and, through their influence, guide the actions of the others.

ISLAND CLASSIFICATION AND RANKING SYSTEM

ISLAND CLASSIFICATION AND RANKING SYSTEM

In order to ensure that the decisions and policies developed for Michigan's Great Lakes islands are based, to the greatest extent possible, upon the resource characteristics and capabilities of the islands, a classification system was developed. The classification system was designed to accumulate island resource data in an effort to determine each relative value of the island in terms of a specific potential use such as habitat preservation, public recreation, development, etc. This system is intended to allow decision-makers the ability to view the value of an individual island in comparison to the value of all other islands for that same use.

The primary source of the data utilized in the Island Classification System is the Heritage Conservation and Recreation Service (HCRS) Island Inventory. This setdata proved to be the most comprehensive and easily accessible source of information on islands. While a setdata of comparable scope was prepared by the Bureau of Land Management (BLM) the data is stored on microfilm and is not easily accessed. More significantly, a comparison of the two setdatas revealed that the HCRS data more closely met the needs of the classification system. (See Appendix C for comparison of HCRS and BLM setdatas.)

Other data necessary to permit the effective classification of islands were identified in contacts with MDNR personnel and other state coastal programs. These data entry points have been included in the classification system and a source for the island specific data identified.

The tool for evaluating available data on islands is the Island Classification System Data Entry Form. The Data Entry Form provides a means whereby resource characteristic information for a specific island is recorded and then assigned a score from an available range for that particular data entry. Three major categories are represented on the form - development potential, recreation potential and resource potential. A score is accumulated within each of these categories for the island being examined. These scores can then be compared with the scores derived for

other islands providing the opportunity for construction of a comparative ranking of islands according to their resource characteristics.

Application of the Island Classification and Ranking System will provide valuable information for individuals, or groups, charged with island management. If, for example, a concern arose that, due to pressure for development of leisure or retirement homes, islands would be targets for development. Obviously not all islands would be affected and efforts for protection would best be directed at only those islands actually threatened. The classification system could easily produce a list of those islands that had the highest potential for development. One of the means of producing the desired listing would be merely to print out from the data file all islands located near existing urban centers. Examination of the Classification System Data Entry Form reveals that location for each island is noted by county, body of water and township, range and section (TRS) code. Preparing a list of islands according to a specified location is thus extremely easy.

Following the same scenario, it would also be possible to sort islands according to other items that would contribute to a high development potential. Information about existing means of access, such as ferry, bridge, boat dock, air service or undeveloped access, is available for each island. Knowledge of all these factors, location, distance from mainland and available access, would contribute to an understanding of the potential for development of a particular island or group of islands.

It should also be noted that the Classification System is designed to produce a score, relative to all other islands, according to three major categories: Development Potential, Recreation Potential, and Resource Potential. While the scores themselves are of value, application of the Ranking System makes them even more valuable. The Ranking System is designed to display the islands according to the score they received in a particular factor or category (e.g. Development Potential). Thus the islands are initially given three ranks, relative to other islands, within the three categories development, recreation and resource. The Ranking

System then produces four more distinct rankings through application of weighting factors. This provides an understanding of the relative ranking of the island reflecting a high demand for one factor (e.g. development) and low demand for the other two factors (e.g. recreation and resource).

The process of developing the Island Classification System Data Entry Form and accompanying Ranking System, along with a more detailed description of use and application, is detailed in Appendix A. At the end of that Appendix are examples of applications of the Island Classification and Ranking System. Use of these tools is intended to continue throughout the implementation of the island management program. As can be seen by examination of the sample applications, the classification and ranking system can provide island specific information which can be of significant aid in the decision-making process.

MANAGEMENT
PROGRAM
OPTIONS

MANAGEMENT PROGRAM OPTIONS

A. The Existing Situation

Any realistic appraisal of potential options for management of Michigan's Great Lakes Islands must begin with an examination of how Michigan's coastal resources as a whole are currently being managed. Who is managing the coastal zone in Michigan? What authorities are being utilized? What is the direction and philosophy of the management effort? How was the direction established initially and who is responsible for ensuring that the direction is maintained in practice?

These roles, responsibilities and authorities are detailed in Chapter V of the State of Michigan Coastal Management Program and Final Environmental Impact Statement (CMP).

As the organization of the roles, etc. obviously are of integral importance to any management program for islands, a brief summary from the CMP is included here.

SUMMARY

"Michigan's Coastal Management Program will utilize regulatory authorities existing at the state and local levels, technical and financial assistance and intergovernmental coordination and cooperation to implement the program. The program will focus these management techniques toward protecting essential coastal resources and assuring wise use and management.

These management techniques and capabilities -- which reside primarily with the Department of Natural Resources -- will be coordinated by the Coastal Management Program utilizing such forums as the Natural Resources Commission, the Governor's system of cabinet committees, the Michigan Environmental Review Board and the Standing Committee on Shorelands and Water Coordination.

Provisions of the Administrative Procedures Act and the Michigan Environmental Protection Act serve to resolve conflicts through contested case hearings and judicial review. The Natural Resources Commission and the Michigan Environmental Review Board also act to resolve conflicts through consideration of all interests in agency decision-making and in making recommendations on environmental impact statements.

Coordination at the local level is achieved through the Citizens Shorelands Advisory Council, participating regional agencies, and through program allocations of technical and financial assistance."

As the summary above reveals the Department of Natural Resources, specifically the Division of Land Resource Programs (LRPD), is the agent primarily responsible for implementing the Coastal Management Program (CMP). The means of implementation revealed in the summary is particularly important. Existing legislation at the state and local level will be utilized with direction supplied through policy adopted by the Natural Resources Commission. There are a number of significant coastal statutes administered by LRPD. While the text of these statutes can be found in numerous references, the following list of titles will be of sufficient aid here:

Utilized in Michigan's Coastal Management Program

- Shorelands Protection and Management Act
  (Act 245 of the Public Acts of 1970)
- Great Lakes Submerged Lands Act
  (Act 247 of the Public Acts of 1955)
- Natural Rivers Act
  (Act 231 of the Public Acts of 1970)
- Wilderness and Natural Areas Act
  (Act 241 of the Public Acts of 1972)
- Inland Lakes and Streams Act
  (Act 346 of the Public Acts of 1972)
- Soil Erosion and Sedimentation Control Act
  (Act 347 of the Public Acts of 1972)
- Farmland and Open Space Preservation Act
  (Act 116 of the Public Acts of 1974)

Implementation of the CMP frequently involves use of other state and local legislation, but the seven statutes listed above are the core of Michigan's program. This type of management approach might best be titled "Integrated", as it integrates a number of existing roles, responsibilities and authorities into a single, comprehensive management program and organization. It should be noted that this differs significantly from a

"Networking" approach utilized by many other state coastal management programs that relied upon exisiting legislation. The primary difference is that the existing roles, etc. were placed under the authority of a single agency - LRPD. In "networked" states, the authorities have been retained by the diverse programs within state government making coordinated consistent action very difficult.

The direction in which the CMP is applied is the responsibility of the seven member citizen Natural Resources Commission (NRC). The position of the NRC is expressed in the shape of formally adopted policies. While it is not possible to list the large number of coastal policies that have been adopted, it is instructive to examine the five resource areas within which the policies have been developed.

Coastal Resource Areas

- AREAS OF NATURAL HAZARD TO DEVELOPMENT
  These include erosion and flood prone areas.

- AREAS SENSITIVE TO ALTERATION OR DISTURBANCE
  These include ecologically sensitive areas (wetlands), natural areas, sand dunes, and islands.

- AREAS FULFILLING RECREATIONAL OR CULTURAL NEEDS
  These include areas managed to recognize recreational, historic or archaeological values.

- AREAS OF NATURAL ECONOMIC POTENTIAL
  These include water transportation, mineral and energy, prime industrial and agricultural areas.

- AREAS OF INTENSIVE OR CONFLICTING USE
  These encompass coastal lakes, river mouths, bays and urban areas.

Even without a detailed examination of these resource areas, it is obvious that Michigan's Great Lakes Islands can include all of them. There is an easily discerned need for regulatory policies which recognize that islands are truly unique areas, requiring unique management approaches and strategies. It is, unfortunately, also true that no such policies have been adopted.

Currently, island management is only addressed in the CMP in the category of areas sensitive to alteration or disturbance. Within that area the following concerns are noted in the CMP relative to Great Lakes islands:

- "To determine adequate measures for protection and enhancement, and to determine land capability, there is a need for comprehensive inventories of the physical and biological charateristics of Michigan's Great Lakes islands.
- Many islands which have shallow soils and poor drainage often support unique and scarce breeding grounds for fish and wildlife. Attempts to develop these areas need to be carefully considered to reduce environmental loss and economic hardship.
- Access to inhabited islands may be interrupted or halted by disruptions of ferry service due to winter navigation. The effects of winter navigation upon ferry service must be evaluated and corrective measures prescribed.
- To protect the historic and archaeological qualities of many Great Lakes islands, funding sources and technical assistance need to be developed and implemented.
- The quality and quantity of drinking water supply is a concern of some island residents. There is a need to investigate and determine alternative sources of water supplies to provide continuously safe and adequate amounts of drinking water.
- Ecological imbalances resulting from past independent experimentation cause reduced carrying capacity and corresponding resource losses. Mechanisms for assigning responsibility for abandoned ventures and projects should be developed and implemented.
- Many islands have bedrock characteristics that are unsuitable for septic fields and sanitary landfills. Creative solutions to past development problems and alternatives to prevent future problems must be developed."

Despite the fact that the CMP recognizes a number of concerns in relation to islands, policy adoption has not taken place. Management is being pursued in a more general, non-specific fashion. As the CMP states:

> "Michigan currently has no regulatory policies which specifically address the problems and program concerns on Great Lakes islands. Where applicable, policies stated through this chapter will be implemented on Great Lakes islands. These policies may relate to wetland protection, air and water quality, etc."

Development of specific policies addressing the problems and program concerns on Michigan's Great Lakes islands must precede initiation of a specific management program. In fact, given the organization of the Michigan CMP, policy development and adoption is an extremely crucial element of island mangement. Island management in Michigan is currently being done in the absence of both the specific direction and endorsement of the Natural Resources Commission.

B. Potential Goals of the Management Program

In light of the preceding discussion on the Michigan CMP, it is natural to assume that little consensus exists as to the type of island management approach that should be pursued. There is, in fact, a wide range of competing interests, developers to preservationists, who possess as equally wide a range of desired activities or results. Since a management program will have to in some way respond to each of these, it is of considerable value to list the potential range of desired results that an individual or group might have for either one, or all, of any island's resources. The extremes of the range are strict preservation and total development. Within that range are various desired results, some of which are compatible and some of which are mutually exclusive. Also, within this range exists the opportunity for multiple, or simultaneous, uses along with uses which are compatible only if developed sequentially.

Range of potential actions or desired results -

1. Preservation of the island resource in current state with absolute minimal disturbance or intrusion.

2. Utilization of island resource by public but in a manner so as to cause minimal disturbance such as in a designated wilderness area.

3. Utilization of the island resource for research which allows for the deliberate manipulation and interpretation of plant and wildlife species.

4. Utilization of the island resource for "intensive" or "developed" recreation which involves some alteration of the natural environment.

5. Exploitation of either all or part of the island resource, as in the development/extraction of timber and/or minerals, which implies at least a temporary disruption of the natural environment.

6. Development of the island resource for non-public use, as in the development of private residential, commercial or industrial uses, which may preclude the implementation of other actions or desired results.

All of the above actions or desired results can be considered legitimate if the circumstances so indicate. By this, it is meant that the circumstances represented by a particular island, or resource(s) present on an island, may make it appropriate or legitimate to pursue a specific action at that location. What is necessary is a responsible and enforceable method of determining what best serves the needs of the greater public. Irresponsible development of island resources which results in the ultimate creation of health hazards or decimated wildlife populations is obviously not in the public interest. Nor is the total abolition of development opportunities on islands necessarily serving the public interest.

C. Island Management Efforts in the U.S.

In order to better understand why Michigan's islands are unique, how they are imperilled, and what might be achieved through implementing a statewide,

comprehensive island management program, it was useful to examine what other states have done, and are doing, to protect their critically important island resources.

Those contacts revealed that little effort has been expended elsewhere toward development of a comprehensive island management program integrated with a state-adopted coastal zone management plan. While some level of inventory of island resources has been completed by nearly all of the coastal states contacted and involved in the implementation phases of the Federal Coastal Zone Management Act, only Maine, Washington, California, and Oregon have attempted to develop island management plans. Even these efforts can only be considered a beginning, first-cut type of approach.

The following comments are a brief summary of the information obtained in the contacts with the various agencies, departments, research facilities, etc. A complete list of the data acquisition contacts, including addresses and telephone numbers, are found in Appendix B. The summaries appear below in the same order as the listing presented in Appendix B.

Federal Agencies

1. Apostle Islands National Lakeshore
   National Park Service
   U. S. Department of the Interior
   Wisconsin

   Three documents have been produced in pursuit of managing Apostle Islands National Lakeshore - a Master Plan (1971), a Statement for Management (1977) and an Interpretive Prospectus (1979). The first two documents outline management guidelines. The latter is designed as a guide for development of interpretive facilities at the park and, therefore, was not of interest.

   The Master Plan and Statement of Management were of interest in that they contained a process for determining uses appropriate to specific portions of the Lakeshore. The decision of appropriate use was based upon the existing character of the land expressed in four classifications - Natural, Development, Historical and Special Use (private in-holdings) zones. The range of land uses which would be pursued within the Lakeshore was based upon identified public recreation needs which the Lakeshore would provide.

   While the Management System pursued in Apostle Islands National Lakeshore was of interest due to its use of a land classification component, the value of the system is limited due to its reliance upon current land use as the primary determinant of classification. There was little attention placed upon examination of the resource capabilities of the area except in a very general sense.

2. Sleeping Bear Sand Dunes National Lakeshore (Manitou Islands)
National Park Service
U.S. Department of the Interior
Michigan

A General Management Plan was developed for Sleeping Bear Sand Dunes National Lakeshore in 1979. Contained in the plan are recommendations for preservation of the resource systems which North and South Manitou Islands represent. The recommendations are based upon the capacity of the island eco-systems to survive use by park visitors. In light of this, the Plan calls for severely limiting use and development of the island so that degradation of the resource is avoided or at least minimized.

It should be noted that the management strategies developed for the Manitou Islands, as well as the Apostle Islands, were prepared for individual islands or island groups. As such, the plans do not represent a comprehensive approach to a management decision-making system.

3. Heritage Conservation & Recreation Service (HCRS)
U.S. Department of the Interior

The Heritage Conservation & Recreation Service conducted an inventory of island characteristics in the late 1960's. The inventory included information on island size, location, topography, ownership, shoreline type, vegetative cover, etc. A report entitled "Islands of America" was published in 1970 which summarized the data collected in the inventory and which stressed the need for preservation of island resources for public use.

The HCRS inventory is not valuable in the sense of providing a model island management system. It does represent, though, the most comprehensive assemblage of the resource characteristics of Michigan's islands and is very valuable for this reason.

4. Army Corps of Engineers
Waterways Experiment Station
U.S. Department of the Army

The research work performed by the Waterways Experiment Station of the Army Corps of Engineers is concerned with possible uses of islands created from dredge materials and, therefore, is not applicable to development of a management system based on resource characteristics.

5. St. Lawrence Islands National Park &
Georgian Bay Islands National Park
Canada

The master plans prepared for both St. Lawrence Islands National Park (1967) and Georgian Bay Islands National Park (1968) were developed after the area had been used for recreation for quite some time. The plans, therefore, were more an attempt to provide the means for meeting a continued and expanding recreation demand than determining appropriate uses based upon resource characteristics.

State Agencies

6. Coastal Coordinating Council
State of Florida

The State of Florida is still involved in preparation of a Coastal Management Program. Contact with personnel at the Coastal Coordinating Council revealed that they have informally begun the process of documenting the need for management of islands as a means of ensuring preservation of a valuable resource. In pursuit of that objective, a document entitled "Barrier Islands, Beaches and Dunes," which will eventually be included as part of the Florida Coastal Management Program was prepared.

In addition to serving as an introduction to Barrier Island ecology, the document also illustrates the problems being encountered due to the lack of established administrative policies and responsibility.

Recommendations are also included to the effect that a plan should be developed which will provide a comprehensive management program based upon base data on Barrier Island ecology, etc. Other than the recognized need for an Island Management Plan, no other progress has been made in Florida.

7. State Planning Office
State of Louisiana

Louisiana, at the time of contact, had not yet finished preparation of a State Coastal Management Program. In regard to the Barrier Islands, present day Louisiana's Gulf Coast shoreline, there was little concern over preparing a management program. The Barrier Islands in Louisiana are of the mangrove type, inundated at high tide, and do not offer a real attraction for development. There is interest in preserving the Barrier Island System for its protective function, but in the absence of threat, there has been little action.

8. State Planning Office
State of Maine

The State of Maine had proceeded further than other state Coastal Programs in that they have developed an Island Mangement Plan. The plan includes an inventory of the resource character of the islands. Based upon the character of the island, a decision as to the most appropriate management authority is made. While this does represent the most comprehensive attempt at developing an island management program, it does not approach the scope of the plan desired for Michigan.

9. Coastal Zone Management Program
State of Maryland

While the State of Maryland does have an approved Coastal Management Program, they have not followed this with a comprehensive island management program. A study of the islands located in the Potomac River has been conducted which investigated the feasibility of

acquisition of the islands. The value of the islands was viewed to be their separation from the mainland and the opportunity for recreation and limited habitat preservation.

10. Executive Office of Environmental Affairs
State of Massachusetts

Massachusetts has an approved State Coastal Management Program but has not addressed island management. A plan has been prepared which specifically addresses the islands of Boston Harbor. While this study did inventory land use, vegetation, etc. on the islands as an initial step, final determination of use was based primarily upon distance from the mainland and associated ease of access. Thus, islands close to the mainland were to be developed for active recreation use while those farther out were to be left undeveloped.

11. Department of Natural Resources
State of Michigan

Considerable contact was maintained with various divisions within the Michigan Department of Natural Resources, primarily through their participation in the Great Lakes Islands Ad Hoc Committee. It was determined that while none of the divisions had officially adopted policies with regard to islands, there were informal guidelines which existed. These guidelines generally took two forms. The first of these was that islands represent unique opportunities for research (wildlife primarily) and recreation due to the isolation they offer. The second guideline was the realization that the difficulty which access to an island represents causes any activity pursued there to be more expensive than if it were located on the mainland. Thus, there should be a realistic economic appraisal made of a proposed island based activity, be it mineral or timber resource exploitation or development of recreation facilities, to determine the cost-effectiveness as compared to providing that same service on the mainland.

12. Division of State Planning
State of New Hampshire

The State of New Hampshire has produced a document which while stressing the need for preservation of islands does not attempt to outline a management plan or approach. At present New Hampshire does not have an approved State Coastal Management Program.

13. Department of Natural Resources & Economics
State of North Carolina

While the State of North Carolina does have an approved State Coastal Management Program, there have not been any substantive policies or standards adopted addressing islands. There has been interest expressed in an Island Management Program, and there is hope it will be begun in the near future.

14. Department of Natural Resources
State of Ohio

Both a State Coastal Management Program (draft) and a Study of the Lake Erie Islands have been produced by the State of Ohio. The document on the islands is not really an effort to produce a management plan. Instead it is an inventory of the cultural, historic and environmental resources of the Lake Erie Islands. The information contained in the Islands Study could serve as an information base for eventual development of a management program.

15. Coastal Zone Management Council
State of South Carolina

While the State of South Carolina does have an approved State Coastal Management program, review of the plan reveals that they have not gone beyond the initial stage of identification of the specific value shoreline areas (i.e., natural, cultural, etc.). This plan does not constitute an island policy or management program in its current state.

16. State Land Commissioner
State of Texas

The State of Texas is still involved in preparation of their State Coastal Management Program. At present, there are no adopted policies for islands nor a management program either formal or informal. It was noted that most islands are under private ownership except for the extensive holdings of the National Seashore. Control of actions on barrier islands which do come under the state's review is performed by a diverse, fragmented group of agencies with the results being unsatisfactory.

17. Commerce & Resource Section
State of Virginia

Virginia is still involved in the preparation of their State Coastal Management Program. It should be noted that the Nature Conservancy presently controls a large number of the islands which are found along Virginia's Atlantic shoreline. Management programs for those islands are controlled by the Nature Conservancy.

18. State Planning Office
State of Wisconsin

While the State of Wisconsin does have an approved State Coastal Management Program, information concerning island management policy was not forthcoming.

ISLAND
MANAGEMENT
PROGRAM

ISLAND MANAGEMENT PROGRAM

A. Management Program Approach

The preceding chapters of this document have established a need for island management, identified the primary conflicts or issue areas involved with such an effort, and examined the range of possible approaches. More importantly the authority by which Michigan manages its coastal zone was analyzed, revealing the types of applications for which it is suited. As a result of this study and research, a number of statements about and recommendations for, an island management program can be made.

The integrated management approach utilized in Michigan's CMP can successfully be applied to the islands as well. The existing statutes that comprise the mangement authority could successfully accomplish the needs of an island management program. What is lacking, as is pointed out in the CMP itself, are formally adopted, regulatory policies concerning management of Michigan's Great Lakes Islands. Development and adoption of such policies is literally the only obstacle to initiation of an island management program.

The island management program recommended in this report is designed to fit within the existing structure of the Michigan Coastal Management Program. As such, it recommends that the Division of Land Resource Programs include general, overall responsibility for Michigan's Great Lakes Islands within the Coastal Management Program which it already administers. No additional management enabling legislation is proposed as it has been shown that existing powers are sufficient. In those instances though, where management responsibility for a specific island is currently being exercised by another of the divisions of MDNR, this practice would continue.

This should not be taken, however, as an endorsement of a "State-only" approach to management. The responsibility for managing Michigan's Great Lakes Islands will be one that is shared among Federal agencies, local government and the State of Michigan. Such a sharing of responsibilities reflects the traditional division of powers between Federal, State and local government. The reasoning behind the sharing also reflects that which

spurred the original division of governmental powers. Some roles and/or functions such as zoning or land use planning are more appropriately performed at the local level rather than Federal or State. Obviously there are instances where the State should assume management responsibility and instances where it should be a Federal agency.

As a means of illustrating the type of involvement most appropriate at the local level, it is necessary only to focus on such. Local governments received powers such as zoning or land use planning through enabling legislation enacted quite some time ago. Control of development at the local level has assured that the needs of the community are met by regulations prepared and implemented by local officials.

The State, however, must be a major force in the management of Michigan's island resources. As has been the practice in the past, State personnel will provide technical assistance in the preparation of local ordinances. This will ensure that current, innovative management techniques and opportunities are utilized whenever possible. Where appropriate, the State will utilize existing legislation to protect and conserve island resources for the benefit of the greater public. In a similar fashion, Federal agencies will be involved when necessary to ensure that national-level interests are guaranteed. This approach, which parallels that which is utilized in the Michigan Coastal Management Program, assigns the task of guiding the management of islands to those possessing the necessary expertise. At the same time, it provides opportunities for contribution and action by those local groups and officials who best understand the particular needs of their community.

The following pages contain recommendations for island policies which could be proposed to the Michigan Natural Resources Commission for adoption. The intent of the policies is to provide the formal enabling authority, the "vehicle," for LRPD to begin the act of island management. In pursuit of that purpose the policies address the six issue areas, or points of conflict and/or controversy, concerning islands which were identified and discussed earlier in this document. While it cannot be assumed these issue areas completely encompass all of the problems or conflicts confronting the

islands, it is presumed that the general policies recommended herein will enable the solution of specific problems or attainment of existing opportunities. The recommended policies listed below are written in the format of already existing state policy.

B. Recommended Island Policies

1. Habitat and Natural Area Protection/Preservation

It is the policy of the State of Michigan to support the protection and/or preservation of critical island wildlife habitat and natural areas identified as such, and designated through, the Area of Particular Concerns nominations of the Michigan Coastal Management Program (Act 245 of the Public Acts of 1970, as ammended).

2. Public Access Control

It is the policy of the State of Michigan to provide access to island areas for the purpose of public use and enjoyment where and when such access can be provided in a cost-effective manner and without danger of serious degradation of the island eco-system (Act 320 of the Public Acts of 1974; Act 316 of the Public Acts of 1965; Act 204 of the Public Acts of 1976).

It is state policy to regulate trespass upon any lands, both by foot or by use of a vehicle or craft, and specifically referring here to islands (Act 323 of the Public Acts of 1976; Act 319 of the Public Acts of 1975, as amended).

3. Constraints on Waste Disposal

It is the policy of the State of Michigan that no Solid Waste Management Plan prepared under the requirements of the Michigan Solid Waste Management Act (Act 641 of the Public Acts of 1978) be granted a favorable review unless that plan contains adequate provisions for proper disposal of solid wastes generated on islands where the

municipality governed by said plan has a Great Lake Island(s) within its jurisdiction.

4. Physical Development

It is policy of Michigan that, in recognition of the value that Michigan's Great Lakes Islands represent to the greater public in terms of recreation and cultural opportunities, continued effort will be made toward securing available undeveloped land for the use and enjoyment by the present and future public (Act 17 of the Public Acts of 1921; Act 204 of the Public Acts of 1976; Act 316 of the Public Acts of 1965).

It is also state policy that management of islands by local governmental authorities, where such occurs, should be conducted in such a manner that development be so regulated as to assure that it will not constitute a future health hazard and will proceed in a manner which ensures the proper use of land and natural resources (Act 168 of the Public Acts of 1959; Act 184 of the Public Acts of 1943, as amended; Act 285 of the Public Acts of 1931; Act 207 of the Public Acts of 1921, as amended; Act 282 of the Public Acts of 1945; Act 183 of the Public Acts of 1943, as amended).

5. Decision Making and Regulatory Authority

It is state policy that the goals and objectives of the State of Michigan for the management of Michigan's shorelands, specifically in this instance, its Great Lakes Islands, shall be promoted at the local level through the granting of financial incentives for the development of responsible local management plans for the protection and preservation of island resources (Act 245 of the Public Acts of 1970).

6. Resource Exploitation

It is state policy that resource exploitation, be it the drilling for oil or gas, removal of timber or extraction of minerals, when proposed for an island be carefully considered throughout all available review

procedures for potential degradation of the fragile island eco-system and to require all necessary and approporatie reclamation of lands subjected to exploitation. (Executive Directive of the Governor, 1974-4; Act 61 of the Public Acts of 1939; Act 92 of the Public Acts of 1970, as amended; Act 244 of the Public Acts of 1924; Act 297 of the Public Acts of 1937).

C. Specific Action Strategies

Adoption of formal island policies, will allow the development of action strategies or programs. These management strategies include a broad range of actions; actions such as undertaking specific studies and inventories, establishing model regulatory systems authorized by existing legislative authority, focusing enforcement and surveillance efforts on particular areas, altering permit requirements, establishing new forms of technical assitance or changing existing levels of assistance efforts, developing new forms of coordination and encouragement to use certain practices, and others.

The management strategies suggested herein are intended to be thought of as a management strategy pool. The broad range and complexity of issues that concern Great Lakes Islands require a flexible management approach. The priorities of public goals and purposes will change with any given situation and the choice of management strategy(ies), the intensity of management, and the managing authority must change also.

A concern in developing management strategies is determining whether or not existing legislative authority can address an issue. A great number of statutes that address island resource management issues have been promulgated and passed through the State and U.S. legislatures. The Coastal Zone Management Act (CZMA) also authorizes the use of the networking approach in coordinating the various laws available for coastal resource preservation, management and enhancement. The concern in the use of CZMA networking is development and implementation of the technical aspects of

networking. For these reasons, the management strategies developed here concentrate on utilizing more effectively the authority provided through existing laws.

It should not be assumed that this list is absolutely exhaustive. It instead presents a list of pursuable objectives representing the type of strategies or action programs that can be developed once authorization is received from the Natural Resources Commission. The strategies presented address a variety of existing laws including a number of those considered coastal statutes and some that are not.

The format of the management strategies contained below is as follows. The provisions of a pertinent law are briefly described in a section called "General Context." Following the General Context, "Strategries" related to the law are recommended and the "Logic" underlying that strategy is discussed.

1. **SHORELANDS PROTECTION AND MANAGEMENT ACT - PA 245 OF 1970.**

General Context: One of the intents of PA 245 is to enhance local mangement/regulatory capabilities for shoreland areas. Implementation of the Act has also reflected this focus on local regulation, relying mainly on existing and modified local tools, like zoning. It appears however that much of PA 245 has been implemented only on mainland Michigan, while Michigan's islands have been ignored. Reflecting the lack of awareness still evident today among other governmental levels, state legislators seldom considered or utilized islands in any language of the Act's, rules and regulations or the Plan for Michigan's Shorelands.

The recent changes in zoning legislation, when coupled with the applications of PA 245 to islands, have created the potential for effective island management, if several management strategies are applied.

Strategy: Undertake studies to designate high-risk erosion and flood risk areas on islands.

Logic: Islands have not been inventoried and studied to determine if any of their shorelines are high-risk erosion and/or flood risk areas. Undoubtedly, many are characterized by these problems and their lack of inventory and designation restricts the state or local governments from effectively regulating their use. This does not allow appropriate application of rules, regulations, and standards of the Act, as well as the criteria and recommendations of the Plan, to islands.

Strategy: Undertake studies to improve coverage of, and determine more accurately, the boundaries of environmental areas on islands. This same detailed level of study should also be afforded high-risk erosion and flood risk areas.

Logic: There are a number of islands with portions or all of their shores designated as environmental Areas of Particular Concern (APC). This provides the potential for protection of these areas. For example, all of the islands in the Thunder Bay (Alpena) area have been so designated. However, many islands, especially smaller ones such as the myriad of islands in Potagannissing Bay, are not designated as environmental APC's where their shoreland characteristics indicate they should be. This, of course, results in the same situation as undesignated high-risk erosion and flood risk areas.

Another problem in this area is the level of detail afforded the inventory of all three areas to be designated. The Plan states that high risk erosion, flood risk and environmental areas under a particular length are not included in the inventory. Indeed, the Plan recommends further study for this concern, recognizing there is no scientific evidence to support the theory that destruction or disruption of areas smaller than a certain threshold size will not significantly impact the coastal environment. This consideration is especially important for islands, which have a high shoreland to interior area ratio.

Strategy: Establish a system, including necessary guidelines, standards and criteria, for direct use of PA 245 designated areas in all planning and regulatory efforts for islands.

Logic: Many governmental agencies and units will be involved with the regulation of designated island shorelands. Many of these agencies, commissions and governing bodies do not fully understand the characteristics of, and logic surrounding the designation of, flood-risk high-risk erosion and environmental areas. Their decisions, therefore, may not consider the potential impacts of their actions on such areas and the activities that occur in them.

To prevent this problem and effectively manage designated areas on islands, several improvements are needed. First, guidelines and standards, in the form of model ordinances, management plan elements and decision-making systems, are needed to aid local, state and federal agencies in dealing with the administrative, legal and decision-making aspects of designated island shorelands. Second, specific criteria and guidelines are needed that indicate how each type of designated area should be managed or regulated. This need is greatest for environmental areas, as flood and erosion problems have been extensively studied and mitigating measures promulgated. Third, State technical assistance to all regulatory and management agencies will be necessary to implement the recommendations above. This aspect will be discussed in further detail under the Michigan CZMP and the Coastal Zone Management Act. Fourth, incentives to local governments to undertake such regulatory and management measures would increase the probability of their implementation. This will also be discussed further in subsequent sections.

2. WETLANDS PROTECTION ACT - PA 203 OF 1979.

General Context: PA 203 provides the State with direct regulatory authority over sensitive environments not before available for inland areas. The Shorelands Protection and Management Act provides for the

protection of environments similar to and often including, wetlands in coastal areas, prior to the passage of PA 203. The Wetlands Protection Act now provides authority to regulate areas on islands not within the coverage of PA 245. However, the Wetlands Protection Act has regulatory gaps that might allow some smaller wetlands to go unregulated.

In addition, the extent of the inventory of wetlands in Michigan is a concern. Until the inventory is completed, enforcement of the Act's regulatory mechanisms will be impaired. If a landowner or a local government is unaware of the areas that have been designated as wetlands, permit applications may not be filed, not allowing the DNR to regulate the proposed development or use. With the past and on-going studies of coastal areas, much valuable information may be available for the wetlands inventory effort.

Strategy: Utilize islands inventory efforts in conducting the wetlands inventory, especially environmental area studies.

Logic: As discussed above, enforcement of the Wetlands Protection Act regulations will be impaired until inventory efforts are completed. Utilization of other inventory and study efforts could hasten the wetlands inventory process and therefore improve regulatory efforts. If undertaken, finalization of the environmental areas inventory could be used to determine the location of wetlands. A problem may arise in that the two inventories have different purposes - the environmental areas inventory is concerned with fish and wildlife habitats, whereas the wetlands inventory is concerned with wetlands. Future efforts should allow for designation of both types of areas.

3. THE CITY AND VILLAGE, COUNTY, AND TOWNSHIP ZONING ENABLING ACTS - PA 207 OF 1921, PA 183 of 1943, PA 184 of 1943

General Context: Zoning had not changed much in enabling legislation or practice for over 40 years in Michigan, until recent extensions of authority in 1978. The amendments made in 1978 allow cities, townships and counties to establish special districts based on environmental and

other parameters. For islands such an extension of authority could prove very beneficial in wisely managing island resources and preventing their unnecessary destruction or degradation. Zoning is generally a local control and the strategy recommended here is one that would be implemented at the local level.

Strategy: Designate islands as special districts or special use zones in local ordinances and utilize the special physical and environmental characteristics of islands as a basis for intent of the district and as a general framework for the development of controls.

Logic: The establishment and use of special districts and special use zones, one of the extensions of authority that occurred in 1978, is probably the most useful of all of the zoning techniques now available. The great utility of this technique is that it provides the basis for so many other zoning techniques and tools.

The difficulty involved with the establishment of special districts or use zones is deciding what should be their basis. One way is to conduct a complete planning study of each island to determine problem areas and make recommendations for dealing with them. This, however, may not prove financially feasible for localities with several islands or where there is no current development pressure on islands. Use of more generalized studies of island environments that have been conducted can provide some direction for establishing units or areas of concern. The Plan for Michigan's Shorelands has established three major areas: environmental areas, high-risk erosion areas, and flood risk areas. Michigan's Coastal Zone Management Program has designated five different areas of concern: (1) areas of intensive or conflicting use; (2) areas of natural hazard to development; (3) sensitive areas; (4) areas fulfilling recreational or cultural needs; and (5) areas of natural economic potential.

Whichever system is utilized, the major islands issues, as discussed in this Plan, should be used for a basis. In this way, this Plan can provide the background needed to support the zoning ordinance amendment and establish a cloak of validity for any court tests.

Where does this leave local governments trying to regulate their islands with zoning powers? It leaves zoning much the same as before - local governments and developers questioning who is in the right and the courts making final decisions. Therefore, a model system for development of special districts and use zones on islands is needed. This system must be cognizant of several factors, State and local needs and trends, including: (1) use or recognition of the many districts, areas and designations that occur under the authority of other laws; (2) the trends of court decisions in Michigan on zoning ordinances, especially requirements for use of innovative tools and techniques; (3) the various island environmental and physical units that exist (high erodible bluff areas, secondary dune zones, upland forests, etc.); and (4) the need for flexibility to allow input of specific local conditions (cultural factors, population growth, etc.).

4. **FARMLAND AND OPEN SPACE PRESERVATION ACT - PA 116 of 1974**

General Context: PA 116 provides for tax relief for landowners who agree not to develop or make improvements to certain types of land. These types of land include farmlands and lands defined as open spaces in PA 116. The administration of the Act has tended to concentrate on achieving tax relief for farmland owners, as there is a great deal of property currently used for farming that is under significant development pressure. The open space provisions of the Act have been utilized to a lesser extent.

This form of relief does exist, however, for open spaces and represents a good potential to preserve islands.

Strategy: Encourage through more innovative programs, the use of PA 116 tax relief/development easements by private owners of Great Lakes islands that are experiencing development pressure.

Logic: PA 116 has not been utilized for the preservation of open space nearly as often as for agricultural land. It has certainly not been frequently utilized for preservation of open spaces on islands. Some of

this can be attributed to the actual provisions of the Act itself-the 10 year minimum length required for the agreement between land owner and State. More likely, however, the lack of activity with this preservation tool though can be attributed to a lack of public knowledge that this Act is more than just the "Farmland Preservation Act."

The opportunities that PA 116 represents could be of significant aid to a land owner. If the land owner were experiencing pressure to develop island property because of the tax burden placed upon the land, PA 116 could provide significant relief. Such a situation would most likely occur on those islands near urban centers, the very islands that it may be most valuable to preserve.

What is needed is a program directed at providing information and encouragement to appropriate property owners. The property owners could be identified by their location adjacent to urban centers or other areas experiencing development pressures. This effort could best be accomplished by LRPD personnel in concert with other information dissemination programs. Contacts might also be conducted by field personel if program budgets make this feasible.

5. COASTAL ZONE MANAGEMENT ACT AND MICHIGAN'S COASTAL MANAGEMENT PROGRAM

General Context: The Division of Land Resource Programs of the Michigan DNR, in its administration of the Michigan Coastal Management Program, has a great deal of ability to influence the actions of other agencies and levels of government. This ability is not necessarily regulatory powers. It is more often embodied in encouragement programs like technical and financial assistance and educational and informational services. However, the Division of Land Resources Programs and other DNR divisions also have many review powers. These powers can now be enhanced by the availability of information about Great Lakes islands.

Several management strategies, therefore, can improve the DNR's efforts to manage Michigan's Great Lakes islands resources.

Strategy: Encourage land planning and regulatory efforts on islands through additional review requirements in Section 306 funding applications.

Logic: The Division of Land Resource Programs is responsible for administering funds for local improvements authorized under Section 306 of the CZMA. There are numerous agencies that provide input into the 306 funding applications review process. Local governments were required to provide information regarding their current planning and regulatory efforts on islands with 306 applications. This information could be used as a review criteria by some or all of the agencies involved in the reviews. Little or no effort in these planning and regulatory efforts would result in a lower score of an application and possibily rejection of the application.

Strategy: Require all Federal programs, actions and activities which are being pursued on Michigan's Great Lakes Islands to be consistent with the policies and intent of Michigan's Coastal Management Program.

Logic: The Federal Coastal Zone Management Act requires Federal agency actions to be consistent with approved state coastal management programs. This requirement allows the Division of Land Resource Programs to ensure that Federal programs developed for islands are consistent with the Michigan Coastal Management Program. This concern is very legitimate as the U.S. Fish and Wildlife Service, in concert with The Nature Conservancy, has announced their intention of preparing a long-range management plan for Harbor Island, located in Potagannissing Bay. Harbor Island provides respite for migratory wildfowl and refuge for ospreys, harriers, Cooper's hawks and bald eagles. There is certainly no justification to assume that the management plan will be in anyway inadequate. It is reassuring though that the State is empowered to review, and approve, any plans.

Strategy: Explore the potential for development of additional monitoring techniques, especially contracting with certain agencies and coordinating monitoring efforts to avoid overlaps.

Logic: A potentially very effective monitoring technique would be contracting with agencies that normally monitor Great Lakes waters. The State Police, County Sheriffs, U.S. Coast Guard and Army Corps of Engineers are probably the best potentials for this strategy. The benefit of this arrangement is that actual costs of surveillance are quite low as trips are multi-purpose in nature. For instance, the Coast Guard simply stops at an island and checks for illegal activities on the way back from a call. The disbenefits and requirements of such a program are: (1) The need to educate such officials in the laws that are being enforced; and (2) The potential that island enforcement activities receive low priority and simply are not undertaken with the level of effort necessary for effective enforcement.

Strategy: Utilize the Islands Classification and Ranking System in the review of permits funding applications, planning, capital improvements, and enforcement levels concerning islands.

Logic: The Great Lakes Islands Classification and Ranking System set forth in this Plan utilizes available data, provides an analysis of this data according to current island management issues and ranks islands according to their development, recreation and resource potentials. This system provides a more comprehensive data base than ever before available for islands and for most areas in the State of Michigan.

The classification and ranking system can be an exceptionally valuable tool for state and local agencies to use in making a myriad of decisions concerning islands. For instance, a state-owned island may prove to have high recreational potential. If this is the case, the island classification and ranking system would make this point and the state could decide to make recreational improvements on the island to meet recreational demand. Secondly, an island with high recreational potential not owned by the State might be an ideal candidate for State acquisition.

The data and manipulative capabilities contained in the Great Lakes Islands Classification and Ranking System allow any State agency to

determine the importance of Great Lakes islands in all efforts that might concern islands. Such an input would be especially valuable in all permit reviews that concern islands.

Strategy: The Division of Land Resource Programs should provide an information and referral service concerning Great Lakes islands matters.

Logic: The Division of Land Resource Programs, by virtue of implementing the Great Lakes Islands Management Program and holding the majority of the information concerning islands, will be a valuable source of information for all of those concerned with Great Lakes Islands. The implementation of this service would increase everyone's awareness of islands, governmental agencies and private individuals alike. Such an information and referral service should be advertised to State agencies, local governments and private citizens who have interests in islands to solicit their use of the service.

APPENDIX A
DATA ACQUISITION ANALYSIS & APPLICATION

I. INTRODUCTION

Regardless of the Management Program developed for Michigan's Great Lakes Islands, effective decision-making will depend upon the existence of an extensive island resource database. Policies must be developed, and decisions made, in the context of a full understanding of the resource system they will impact. Decisions which affect the commitment of island resources must be made with an understanding of the value of the resources in question in terms of the resources of the entire system. It must also be possible to determine, through an understanding of the island resource characteristics, the degree or magnitude of impact which can be anticipated from a proposed action.

In pursuit of assembling the database mentioned above, a wide range of data acquisition activities were undertaken. Numerous sources were contacted to accumulate data on the resource characteristics of Michigan's Great Lakes Islands. Past studies conducted by both federal and state agencies and departments were reviewed for their potential input. Also, specific attention was placed upon identifying agencies, organizations, etc. whose responsibilities included maintaining current up-to-date information on specific resources, such as soils, timber or mineral resources.

At the same time, contact was made with other state Coastal Programs and appropriate federal agencies and programs to determine whether or not an Island Management Program had been successfully developed elsewhere. The intent was to identify how, if such existed, the Management Program had integrated island resource information into the management decision-making process. An existing program of similar scope and intent could have provided the means of avoiding unsuccessful techniques and strategies, allowing concentration on proven systems.

The product of this effort was detailed in Chapter V of this report. As was shown, there was little previous work done on island management in other states that was directly applicable. It was also discovered that information on soils, groundwater, etc., which is easily accessed for most areas in Michigan was not

which is easily accessed for most areas in Michigan was not readily available for islands. As much of this information was essential to the database, alternate sources of data were identified. Finally, the Island Classification System, including the Ranking System, was computerized allowing machine-based data management and analysis.

The following section details the development of the Island Classification and Ranking System and is accompanied by sample applications of each. The information gaps which were encountered are listed, along with alternate means of acquiring the data, in Section III.

II. ISLAND CLASSIFICATION AND RANKING SYSTEM

A. Development of the Island Classification and Ranking System

The initial step in developing the classification system was a review of existing systems being utilized by other programs at the state and federal level. The result of that review was the realization that few programs have developed or initiated the use of a classification system which approaches the level of complexity, or value, that is desired for this project. While it was discovered that most state coastal management programs do attempt to classify their coastal resources, including islands, the methodologies being applied cannot truly be considered a "system." Rather the approach taken is usually directed at dealing with issues such as "Is the resource (e.g., island) available for public use at a reasonable price?" or "Will this proposed use provide a public benefit that cannot be provided at least as well elsewhere?". Answering such questions would provide information on issues such as availability of a specific resource, feasibility of acquisition, regional or local demand for use to be provided and, perhaps, scarcity of the resource. This information can be valuable but it at best represents a "crisis," or case-by-case, approach to decision making.

The exception to the rule above is the classification system developed by the State of Maine, Bureau of Public Lands. This system was developed specifically to classify islands according to basic ecologic characteristics, acreage, proximity to existing public or quasi-public ownership, and special features. The accumulated data were then used to make recommendations for management of islands under five broad categories into which the islands were assigned. The categories were expressions of the best potential use of the island, according to resource characteristic, and consisted of the following:

- o bare ledge
- o salt marsh and active bars
- o islands of unconsolidated marine sediment
- o islands with soils and grass/shrub vegetation
- o islands with soils and forest vegetation

As such, the Maine system provides a classification of the type of habitat resource an island provides. The other information is used to determine the appropriate agency, because of existing expertise or experience, to assume management responsibility.

Once again, this system does not resemble the classification approach which is desired for this project. Determination of habitat type and management responsibility is only a portion of the system that is being pursued. It should also be noted that the Maine classification system, because of the type of field survey form used, includes a significant number of subjective decisions by the field personel regarding the island in question. The system has been used extensively though, and the Main Bureau of Public Lands is satisfied with the results -- as an initial step. The Draft Scheme #1, presented later in this section, represents a modification of the classificaton system developed in Maine.

Contact was made with a number of Divisions within the MDNR to determine if a classification system was part of their methodology for review of potential or existing properties either of interest to their Division or already in their control. The Divisions contacted were Parks, Wildlife, Fisheries, Waterways, Forest Management and the Michigan Land Trust Fund. Conversations with personnel in the four of those listed above revealed that they have not established a working and uniform classification system for categorizing properties. Instead, they rely on the expertise of Division personnel, gained through on-hands experience, to make decisions concerning the most appropriate use of an existing resource. All four of the Divisions reported that their current methods have met their immediate needs successfully, but did indicate an interest in an applicable resource classification system.

The Michigan Land Trust Fund has an established review system that is used for analysis of properties nominated for acquisition through the Fund. This system prioritizes parcels according to their ability to meet one or more of the following goals of the Michigan Land Trust Fund:

- o Preservation of open space/recreation opportunities in close proximity to urban concentrations.
- o Preservation of habitat essential to identified endangered or threatened plant and animal species.
- o Consolidation of public ownership in the Pigeon River Country State Forest.
- o Uniqueness of features present on-site as compared to the region and state.
- o Consolidation of adjacent public ownership of open space/recreation land.
- o Opportunity for public education or interpretive unit.
- o Ability to obtain riparian ownership.

While this system does use a scoring approach, assigning points according to fulfillment of the criteria above, the field survey form is primarily open-ended. In fact, much of the information about the nominated property is obtained from the individual or group who initiated the nomination. The validity of comparing the scoring of one parcel with another thus is very questionable. It would not appear that application of this system to the project at hand is advisable.

The classification system devised by the Forest Management Division is an extremely extensive, staged process. The objective of the system is to provide information for operating decisions relating to resource outputs for timber, wildlife, forest recreation, water quality and other forest uses. As such, it inventories wildlife species, timber types and productivity, characteristics of the area watershed, types of food providing ground cover, and amount and type of existing roads and pathways on the property. It is, obviously, quite specifically patterned on forest management issues and needs, and not immediately applicable to the project at hand. The system does illustrate some issues which are of interest to a comprehensive classification system though and these have been incorporated into the draft schemes presented later. Also of interest was that the system had been prepared in a manner which allowed the data to be reported in a machine- readable format for computer storage and analysis. The benefits of such an application makes it obvious that the final classification system produced by this project be organized in a similar fashion.

B. Description of Draft Classification Systems Developed

Draft Scheme #1:

As mentioned previously, the first classification system presented in this report was prepared in a form similar to that used by the State of Maine, Bureau of Public Lands. The field survey form gathers information in five major areas:

- o General Input (size, location, accessibility)
- o Geologic Input (surficial & bedrock)
- o Biologic Input (plant & animal species)
- o Historic Input (historic and prehistoric occupation)
- o Current Development Status

A summary input section is also included, allowing field personnel to list overall impressions of the area, unique values present and local sources of input.

The field survey form is designed for open-ended responses and would be administered by a field team which collectively possessed expertise in the major areas contained on the form - biology, geology and historical/prehistorical occupation in the area. The product of the field work would be an inventory of the resource characteristics of the site and an evaluation of the value of those resources as determined by the collective expertise of the field team.

Listed below are some of the advantages and disadvantages of this system as presented. Following that list is a copy of the Field Survey Form for Draft Scheme #1.

Advantages:

- o Open-ended responses provide the opportunity for the respondent to list more information than a simple check-list type of form. This can result in more, and different types of information being reported that the form had not anticipated.

- The opportunity is provided for the field personnel to state personal opinions regarding the site, which in some instances could prove to be valuable for final analysis.

Disadvantages:

- The system requires field visits to obtain the data necessary to complete the form.
- Since the responses on the form are open-ended it is difficult to make valid comparisons of one site with another based on the accumulated data.
- The responses of the field personnel are not scored or rated thus no measure of significance of a particular item is made.
- The field survey form, as presented, does not result in a parcel being placed into a particular classification or category (i.e. geologic, biologic, etc.) Instead, it is left up to some final individual to evaluate the accumulated data and then determine the correct classification.
- Subjectivity, which is introduced whenever an open-ended type of form is utilized, makes the validity of each field product debatable, along with any decisions based on that field work.

DRAFT

SCHEME #1

ISLAND CLASSIFICATION SYSTEM

FIELD SURVEY FORM

1. COUNTY NAME _____ 2. ISLAND NAME _____

3. LOCATION _____ 4. SURVEY DATE _____

GENERAL INPUT:

5. SIZE _____ 6. ELEVATION _____

7. GENERAL ISLAND TYPE(e.g. low-wetland, vegetated upland, bare rock, artificial, etc.)

_____

_____

_____

8. ACCESS BY: _____ 9. DISTANCE FROM SHORE _____

10. BOAT LANDING/LAUNCHING CAPABILITY _____

11. SHELTERED (REFUGE) AREA(s) _____

12. GENERAL ACCESSIBILITY _____

13. EXISTING USE/DEVELOPMENT PRESENT _____

_____

GEOLOGIC INPUT:

		SURFICIAL
14.	LAKES _____	_____ % (OF TOTAL AREA)
15.	SWAMPS/BOGS _____	_____ % (OF TOTAL AREA)
16.	MARSHES _____	_____ % (OF TOTAL AREA)
17.	STEEP SLOPES PRESENT _____ (>%)	_____ % (OF TOTAL AREA)

18. SHORE TYPES _____

19. BEACH LENGTH, SLOPE, WIDTH (IF PRESENT) _____

_____

20. FRESH WATER AVAILABILITY & QUALITY _____

_____

21. SOIL TYPE(s) _____

_____ % _____ % _____ %

22. EXISTING EROSION DANGER-SHORELINE _____

23. EXISTING EROSION DANGER-UPLAND _____

24. UNIQUE GEOLOGIC FEATURES PRESENT _____

_____

BEDROCK

25. SEDIMENTARY _____ _____% (OF TOTAL)

26. IGNEOUS _____ _____% (OF TOTAL)

27. MINERAL RESOURCES PRESENT _____

_____

BIOLOGIC INPUT

28. VEGETATION TYPES _____

_____

* - IF POISON IVY PRESENT, PLEASE INDICATE

29. VEGETATION COVER: % FORESTED _____ % SHRUB _____

% GRASSLAND _____ % OTHER _____ (See GEOLOGIC INPUT

30. RARE OR ENDANGERED PLANT SPECIES _____

_____

31. ANIMAL SPECIES (species, numbers and use of area) _____

_____

_____

32. RARE OR ENDANGERED ANIMAL SPECIES _____

_____

HISTORICAL INPUT

33. PAST USES _____

34. PREHISTORIC OCCUPATION SITES _____

_____

35. HISTORIC SITES, STRUCTURES, USES, ETC. _____

_____

36. HISTORIC/PREHISTORIC INTERPRETATION OPPORTUNITY _____

_____

CURRENT DEVELOPMENT STATUS

37. EXISTING ROADS _____

38. EXISTING STRUCTURES _____

39. OWNERSHIP _____

40. DISTANCE TO MUNICIPALITY OF <5,000 POPULATION _____

41. DISTANCE TO MUNICIPALITY OF 5,000-25,000 POPULATION _____

42. DISTANCE TO NEAREST STANDARD METROPOLITAN STATISTICAL AREA _____

43. STATUS OF AREA IN LOCAL PLANS & ORDINANCES _____

_____

44. STATUS OF AREA IN REGIONAL PLANS _____

_____

45. STATUS OF AREA IN MICHIGAN COASTAL ZONE MANAGEMENT PLAN _____

_____

SUMMARY

46. OVERALL IMPRESSIONS OF AREA _____

_____

_____

47. UNIQUE SCENIC VALUES/ATTRIBUTES PRESENT _____

_____

_____

48. LOCAL SOURCES OF INPUT _____

_____

_____

Draft Scheme #2:

The second scheme presented here is an adaptation of a classification system contained in a briefing paper entitled "Potential Components, Management Constraints, and Implications of a Comprehensive Land Acquisition Program in Michigan", prepared for the MDNR-CPU by a current staff member of J&A. Extensive modification of the system has been performed so that it fits the demands of this specific application. The positive features of the system, primarily the scoring system and the use of closed responses, were retained.

The field survey form for Draft Scheme #2 is designed as a checklist with ranked values for the resource factors included on the form. The field personnel, through completion of the form, essentially score a site according to the existing resource characteristics. Four major categories are included on the form:

- o Geologic
- o Biologic
- o Historic
- o Social

The product of the field work would be assignment of the particular site to one of the four listed categories. This results from the summation of the scores within each of the categories. Thus, the classification of the resource is accomplished directly by the field personnel and does not require a final determination by another source.

Listed below are some of the advanatages and disadvantages of this sytem as presented. Following that list is a copy of the Field Survey Form for Draft Scheme #2.

Advantages:

- o The level of subjectivity of response by the field personnel is significantly reduced by the close-ended response type of form.

- o The opportunity, and validity, of comparision of sites is enhanced by a system that uses a scored or numeric value approach.
- o The system is designed to produce a classification of one site by category without necessity of review of accumulated data.
- o The nature of the responses from this form provides the opportunity for machine (computer) storage and analysis of the accumulated data.

Disadvantages:

- o The system requires field visits to obtain the data necessary to complete the form.
- o A close-ended response form limits the field personnel as to the type of information which can be listed for a specific site.
- o The values assigned to specific factors within the categories may reflect the biases of the survey instrument preparer.
- o No system has been devised to resolve the conflict produced when a site qualifies under more than one category.

DRAFT

SCHEME #2

ISLAND CLASSIFICATION SYSTEM

FIELD SURVEY FORM

ISLAND NAME: _____

COUNTY NAME: _____

LOCATION: _____

DATE OF SURVEY: _____

:TEGORY	VARIABLE/FACTOR	VALUE(s)	SCORE
:ologic	Significant Inland Landforms present (e.g. lake, swamp, bog, etc.) which provides valuable habitat or human experience opportunity	3	_____
	Significant Shoreline Landforms present (e.g. major dune formations, bluffs/cliffs, cliff arches or canes, pedestal rocks, etc.) which provides valuable habitat or human experience opportunity	3	_____
	Evidence of Active Shoreline erosion/deposition Deposition Slight Erosion Severe Erosion	 1 2 3	_____
	Illustrative Evidence of Glacial Processes/ Action (e.g. glacial formed, grooved, striae, polish, eskers, kames, erratics, kettles, etc.) which provide human experience or research opportunity	3	_____
	Significant Land features present which illustrate Geologic Land Forming, Processes (e.g. caves, sinkholes, sinking streams, etc.)	3	_____
	Presence of Quality Freshwater Supply (i.e. availability of constant groundwater supply)	3	_____
	Significant Fossil evidence present (e.g. fossils of non-human, pre-historic life forms)	3	_____

CATEGORY	VARIABLE/FACTOR	VALUE(s)	SCORE
Geologic	Significant evidence of Land Forming Processes (e.g. rock units or exposed strata) which illustrate ancient environments, events or periods.	2	
	Presence of valuable mineral deposits	3	
	Opportunity to conduct/pursue research of geologic processes		
	High (i.e. existing research station)	3	
	Medium	2	
	Low	1	
	Qualifying Score = 19 Geologic Total		
Biologic	Vegetative Cover Type which can be termed as dominant		
	Mature Forested	3	
	Shrub/Grassland	2	
	Bare Rock/Sand	1	
	Verified Presence of plant or animal species on state or federal list of endangered species	3	
	Verified presence of plant or animal species on state or federal list of threatened species	3	
	Performs essential biological function (e.g. provides habitat, either seasonal or migratory, for waterfowl, spawning grounds for fish species that are either rare or of commercial and/or recreational value)	3	
	Opportunity to conduct/pursue research of biologic processes		
	High (i.e. existing research station)	3	
	Medium	2	
	Low	1	
	Qualifying Score = 6 Biologic Total		
Historic	Presence of significant historic structures/ site(s)	3	
	Evidence, either physical or local lore, of historic use of either local or regional significance	2	
	Evidence of prehistoric use or occupation	1	
	Opportunity to conduct/pursue historic/ archeological research	3	
	Qualifying Score = 3 Historic Total		

CATEGORY	VARIABLE/FACTOR	VALUE(s)	SCORE
Social	Current Contiguous Land use		
	Similar Use/Publicly Owned	3	
	Low Intensity (e.g. agricultural)	2	
	High Intensity (e.g. more than 1 structure /.25 acres)	1	
			_____
	Current Development Status/Potential for Natural Value Recovery		
	Undeveloped	3	
	Developed with Recovery Potential	2	
	No Recovery Potential	1	
			_____
	Existing Level of threat of Alteration or Destruction (e.g. ultimate loss of resource value to public)		
	Immediate Threat	3	
	Possible Impending Threat	2	
	No Threat Potential	1	
			_____
	Proximity To Urban Concentrations (combination of distance to communities and the size of the communities)		
	Population Distance (0-25 mi./25-50 mi./>50mi.		
	<5,000 3( ) + 2( ) + 1( ) =		
	5-25,000 6( ) + 4( ) + 2( ) =		
	>25,000 9( ) + 6( ) + 3( ) =		
	NOTE: Multiply distance points by the number of cities of particular population within distance radius and then sum to arrive at final value		
	If <5,000 score is more than 45	1	
	If 5-25,000 score is more than 30	1	
	If >25,000 score is more than 5	1	_____
	Size of Site in Acres		
	>640 acres	3	
	160-640 acres	2	
	<160 acres	1	
			_____
	Public Support/Attitude Concering Public Use of Site		
	Positive	3	
	Indifferent	2	
	Unknown	1	
	Negative	0	
			_____

CATEGORY	VARIABLE/FACTOR	VALUE(s)	SCORE
Social	Accessibility of Site		
	Existing Ferry Service	3	
	Existing Boat Launching/Landing Facility	2	
	Shoreline approachable by small craft	1	
	Site unapproachable due to shoretype (e.g. bluffs, submerged rocks, etc.)	0	
			_____
	Public Use Compatible with Provisions of Michigan Coastal Zone Management Plan		
	Compatible	3	
	Not Determined, Modification Possible	2	
	Not Compatible	1	
			_____
	Public Use Compatible with Provisions of Adopted Regional Plans		
	Compatible	3	
	Not Determined, Modification Possible	2	
	Not Compatible	1	
			_____
	Public Use Compatible with Provisions of Adopted Local Plans		
	Compatible	3	
	Undetermined, Modification Possible	2	
	Not Compatible	1	
			_____
	Existing Level of Air & Water Pollution at Site using established EPA standards as the base		
	High: Better than EPA standards	3	
	Medium: Meets EPA standards	2	
	Low: Below EPA standards	1	
			_____
	Potential for Providing Identified Recreation needs/demands for area in which site is located.		
	High: Can provide all of needs/demands	3	
	Medium: Can provide some of needs/demands	2	
	Low: Can provide none of needs/demands	1	
			_____
	Qualifying Score = 24	Score Total	_____

C. Recommended Classification System

The island classification system presented here is designed to utilize the information contained in the island inventory prepared by the Heritage Conservation and Recreation Service (HCRS) and supplemental information obtained from a number of divisions within the Michigan Department of Natural Resources (MDNR). This information will serve as the data base for review, analysis and eventual classification of Michigan's Great Lakes Islands. An example of the Data Entry Form, which is the evaluation tool of this classification system, follows this brief introduction to its content and use.

The island classification system is divided into three broad categories - Development, Recreation and Resource Potential. Within each of these categories are a series of "factors", or data elements, which address the characteristics of the island. A factor, such as size, is obtained for the island in question from the existing data base and is then entered on the Data Entry Form. Depending on the nature of the entry for the particular factor, a value for the entry is derived which then produces a score. The scores are summed within each category (e.g., Development Potential, etc.) to achieve a total category score.

In assigning the values to each of the factors contained in the Data Entry Form, a number of initial decisions were required. These decisions involved determining the relative value of a large island as compared to a small one or an island with a variety of land form types as compared to one with a single type. This was necessary as the assigned values are used in the classification system as a means of determining the potential of an island for development, recreation or resource use.

It was decided that maximum diversity of the resource, in terms of potential recreation activities, existing quality resource characteristics, topography and shoreline types, etc., would receive the maximum value. Thus, a high value would be assigned to an island with a large number of potential recreation activities, large in size and possessed of a diversity of quality resource characteristics and togography and shoreline types. Values were assigned in a similar vein to the other factors; always assigning a higher value for diversity.

It should be noted that changing the determination of values assigned within the factors allows the production of alternative classification systems. If, for example, it was decided to assign the higher value to small islands rather than large, the results of the scoring would be dramatically different. It is obviously possible to vary the values asigned to the various factors producing a variety of desired results. Thus, this classification system can be adjusted to the specific intent of the individual using the system.

The product of the Data Entry Form is a score for each of the islands which is then applied to a Summary Evaluation. The Summary Evaluation then relates this score to the range of potential scores and classifies it as to its level of potential within each of the three categories in relation to the other islands which have been classified.

Interpretation of the scores accumulated within the three categories - Development, Recreation and Resource Potential - is done according to the ranges established below. The entire range of potential scores from within each category has been divided into three sub-ranges - high, medium and low. By locating the score produced for a specific island on the score range, the sub-range into which it falls for that category is identified.

The ranges represent an expression of the level - high, medium or low - of potential for use within the specific categories. Thus, an island receives a score which classifies it according to its development, recreation or resource preservation/exploitation potential. This allows the islands to be organized into 27 classes based upon their position within the three potential sub-ranges for each of the three classification categories. The range is illustrated below.

Development Potential: Score Range = 30 (maximum) - 6 (minimum)

Scores	Level of Potential for Development
Sub-Range 1: 23-30	High
Sub-Range 2: 14-22	Medium
Sub-Range 3: 6-13	Low

Recreation Potential: Score Range = 35 (maximum) - 7 (minimum)

Scores	Level of Potential for Recreation Use
Sub-Range 1: 27-35	High
Sub-Range 2: 17-26	Medium
Sub-Range 3: 7-16	Low

Resource Potential: Score Range = 45 (maximum) - 9 (minimum)

Scores	Level of Potential for Resource Preservation Exploitation
Sub-Range 1: 34-45	High
Sub-Range 2: 21-33	Medium
Sub-Range 3: 9-20	Low

Once the levels for each of the three categories are known for a specific island, it can be placed into one of the 27 classes. These classes vary from those islands receiving a "high" ranking for each of the three categories to islands which received a "low" ranking for each of the categories. Thus, it is possible to determine that an island, for example, has a high potential for resource exploitation, and low potential for development and a medium potential for recreation use.

It should be noted that division of the total range of scores into sub-ranges was accomplished simply by dividing the total into thirds. This was done in the absence of data which reveal what scores will be produced through application of the classification system to Michigan's Great Lakes Islands. It may prove necessary to adjust the sub-range cutoffs for one or more of the categories if it is found that the scores produced all occur at one end of the total range. Until such data are available, the existing cutoffs for the categories will serve as a valid, comparative measure of potential.

Alternative

The evaluation system described above utilizes a fixed value or threshold for interpreting the scores accumulated within the classification system categories. The entire spectrum of potential scores is divided into three ranges representing high, medium, or low potential for the specific category. This particular method provides a good means of making comparative judgments between a group of islands, but may not meet the needs of all policy or decision making situations.

A situation might easily occur wherein it was desirable to examine the value of a single factor within a category, such as the size of the island within the development potential category or the seasons of potential recreation use within recreation potential. In such a situation it is possible to classify the islands in question by their score for just one factor. The sub-ranges of high, medium and low would be determined by those involved and would represent a comparative judgment. The primary advantage, or rather simply the difference, of this alternative is that it allows the decision- maker to produce a classification of a group of islands by a single factor, when desired, rather than by an entire category of factors. Since the values, or cutoff points, are determined on a case by case basis, this can be referred to as a floating threshold classification as compared to a fixed threshold system.

Listed below are some of the advantages and disadvantages of the recommended system as presented. Following that list is a copy of the Data Entry Form.

Advantages:

- o The system is designed for direct and effective use of the information ntaine in the HCRS island inventory.
  The system allows for adjustment of values assigned to factors contained within the system according to the preference of the user.
- o The nature of the product of this form provides the opportunity for machine storage and analysis of the accumulated data.

Disadvantages:

- o The values assigned to the factors within the categories are subjective and may reflect the biases of those responsible for preparing the form.
- o Completion of the Data Entry Form, with its numerous input sources, may prove to be highly time consuming.

ISLAND CLASSIFICATION SYSTEM

DATA ENTRY FORM

GENERAL

1. Island Name: _____ 2. I.D. Code (HCRS): _____
3. Body of Water Name: _____ 4. I.D. Code (MDNR): _____
5. County Name: _____ 6. I.D. Code (MDNR): _____
7. Location (Township/Range/Section #) T: _____ R: _____ S: _____
8. Ownership: _____

(If more than one owner/manager, enter all and indicate % of ownership for each, if known.)

CATEGORY	FACTOR	VALUE	SCORE
DEVELOPMENT POTENTIAL:	I. Size of island.		
	A. If single island, enter total acreage below, derive sub-score, enter value at entry point #9 (next page) and go on to question II. If island group, go on to questions I.B.-I.D.		
	_____single island acreage	If <10 acres = (1) If 10-99 acres = (2) If 100-499 acres = (3) If 500-999 acres = (4) If >999 acres = (5)	
		sub-score	_____
	B. If island group, enter total acreage of all islands in island group.		
	_____island group acreage	If <10 acres = (1) If 10-99 acres = (2) If 100-499 acres = (3) If 500-999 acres = (4) If >999 acres = (5)	
		sub-score	_____
	C. If island group, enter total acreage of island >10 acres within the island group.		
	_____acreage of islands >10 acres	If <10 acres = (1) If 10-100 acres = (2) If 100-499 acres = (3) If 500-999 acres = (4) If >999 acres = (5)	
		sub-score	_____

CATEGORY	FACTOR	VALUE	SCORE

D. If island group, enter the number of islands which fall within the size ranges listed below.

	% of total
_____(# of islands <10 acres)	_____
_____(# of islands 10-99 acres)	_____
_____(# of islands 100-499 acres)	_____
_____(# of islands 500-999 acres)	_____
_____(# of islands >999 acres)	_____

_____ total # of islands in group

If <10 acres represents highest % = (5)
If 10-99 acres represents highest % = (4)
If 100-499 acres represents highest % = (3)
If 500-999 acres represents highest % = (2)
If >999 acres represents highest % = (1)

sub-score _____

*For entry point #9 enter either the sub-score from I.A. OR 1/3 of the sum of the sub-scores from I.B., I.C., & I.D.

*9. _____

II. Indicate present means of access to island.

Air service	_____
Bridge	_____
Boat dock/marina	_____
Ferry service	_____
Undeveloped access	_____

Total # of access means _____

If 1 indicated = (1)
If 2 indicated = (2)
If 3 indicated = (3)
If 4 indicated = (4)
If 5 indicated = (5)

10. _____

III. Enter air distance, in miles, from mainland to center of island.

_____ miles

If <5 miles = (5)
If 6-10 miles = (4)
If 10-20 miles = (3)
If 20-50 miles = (2)
If 50-100 miles = (1)

11. _____

CATEGORY	FACTOR	VALUE	SCORE

IV. Indicate the proximity of the island to urban concentrations. Enter the # of communities of specific size which fall within the particular distance range and then complete the calculations.

Population	Distance (in miles) (0-25)	(26-50)	(>50)	
<5,000	3( )+	2( )+	1( ) =	_____
5-25,000	6( )+	4( )+	2( ) =	_____
>25,000	9( )+	6( )+	3( ) =	_____

If <5,000 Score > 45 = (1.0)
If 5-25,000 Score > 30 = (1.5)
If >25,000 Score > 5 = (2.5)

Total = _____

*Enter total in Entry Point #12. Note- a minimum score of 1 must be entered regardless of total of values column. *12. _____

V. Are the soils on the island suitable for on-site treatment of wastewater.

1: Yes 2: No

_____

If 1 = (5)
If 2 = (1)

13. _____

VI. Is potable water supply available now or feasible?

1: Yes 2: No

If 1 = (5)
If 2 = (1)

_____

14. _____

TOTAL SCORE OF DEVELOPMENT POTENTIAL CATEGORY
(Sum of all scores from Development category) ☐

CATEGORY	FACTOR	VALUE	SCORE

RECREATIONAL POTENTIAL:

I. Indicate acreage presently available for public or quasi-public recreation use by management category.

	% of total*	Weight Factor (multiply)	Product
Federal	_____	x .05	= _____
State	_____	x .04	= _____
Other public	_____	x .03	= _____
Quasi-public	_____	x .02	= _____
Private	_____	x .01	= _____

(Enter sum of product column)
(Note - A minimum value of 1 must be entered.)

15. _____

*See data entry point I.A. for size of single island and I.B. for size of island group.

II. Indicate the percentage of island developed with non-recreation uses by entering appropriate code.

1: no developed
2: 1-25% developed
3:26-50% developed
4:51-75% developed
5:76-100% developed

_____

If 1 = (5)
If 2 = (4)
If 3 = (3)
If 4 = (2)
If 5 = (1)

16. _____

III. Is recreation area development programmed for the island during the next 5 years?

1: yes 2: no

_____

If 1 = (5)
If 2 = (1)

17. _____

IV. Indicate acreage suitable for recreation use.

_____ acres

% of total*			
1-25% (1)	26-50% (2)	51-75% (3)	76-100% (5)

*See data entry point I.A. for size of single island and I.B. for size of island group.

18. _____

CATEGORY	FACTOR	VALUE	SCORE

V. Indicate numbers of public parks located on island(s) by category of management authority for island.

# of parks in Federal managed island(s)	____	If $\geq$ 1 = (2.5)
# of parks in state managed island(s)	____	If $\geq$ 1 = (1.5)
# of parks in other public managed island(s)	____	If $\geq$ 1 = (1.0)
Total	____	If total = 0 = (1.0)

(sum of values) 19. _____

VI. Indicate which of the following are potential recreational activities for the island.

Swimming	_____
Hunting	_____
Fishing	_____
Picnicking	_____
Camping	_____
Boating	_____
Water-skiing	_____
Hiking/walking	_____
Sightseeing	_____
Wilderness	_____
Skin/scuba diving	_____
Winter sports	_____
Nature study	_____
Bicycling	_____

Total # of potential activities _____

If 1 - 4 = (1)
If 5 - 9 = (3)
If 10 -14 = (5)

20. _____

VII. Indicate the season(s) of potential recreation use.

Winter	_____
Spring	_____
Summer	_____
Fall	_____
All	_____

Total # of seasons _____

If 1 = (1)
If 2 = (2)
If 3 = (3)
If 4 or All = (5)

21. _____

TOTAL SCORE OF RECREATION POTENTIAL CATEGORY
(Sum of all scores from Recreation Potential category). [ ]

CATEGORY	FACTOR	VALUE	SCORE

SOURCE POTENTIAL:

I. Indicate the maximum elevation, in feet, above mean high water level.

_____ feet

If < 6 feet = (1)
If ≥ 6 feet = (5)

22. _____

II. Indicate the percentage of topography types present on the island.

Level	____%
Rolling	____%
Mountainous	____%
Other	____%

Total # of types present _____

If 1 type present = (1)
If 2 types present = (2)
If 3 types present = (3)
If 4 types present = (5)

23. _____

III. Indicate the percentage of shoreline types present on the island.

Beach	____%
Bluff	____%
Swamp/Marsh	____%
Other	____%

Total # of types present _____

If 1 type present = (1)
If 2 types present = (2)
If 3 types present = (3)
If 4 types present = (5)

24. _____

IV. Indicate the percentage of vegetative cover types present on the island.

Grass/pasture	____%
Forest	____%
Shrub	____%
Swamp/marsh	____%
Cultivated	____%
Naturally barren	____%
Water	____%
Mangrove (ignore)	____%
Developed land	____%
Other	____%

Total # of types present _____

If 1-2 types present = (1)
If 3-4 types present = (2)
If 5-6 types present = (3)
If 7-8 types present = (4)
If 9-10 types present = (5)

25. _____

CATEGORY	FACTOR	VALUE	SCORE

V. Indicate which of the following quality characteristics are present on the island.

Scenic quality _____
Significant plant or animal communities _____
Nature/wilderness quality _____
Geological/palentological quality _____
Fish/wildlife habitat quality _____
Underwater habitat quality _____
Swimming beaches quality _____
Historical quality _____
Archeological quality _____
Cultural quality _____
Other _____

Total # of quality characteristics _____

If 1 - 3 = (1)
If 4 - 7 = (3)
If 8 - 11 = (5)

26. _____

VI. Indicate the prescence of an identified, exploitable mineral resource on the island.

1: present 2. not present

_____

If 1 = (5)
If 2 = (1)

27. _____

VII. Indicate the presence of an identified, exploitable timber resource on the island.

1: present 2. not present

_____

If 1 = (5)
If 2 = (1)

28. _____

VIII. Indicate the minimum depth (in feet) of the water table below the land surface.

_____ Ft.

If >8 feet = (5)
If $\leq$8 feet = (1)

29. _____

CATEGORY	FACTOR	VALUE	SCORE

IX. Indicate the average depth (in feet) of the overburden (measured from land surface to bedrock) on the island.

_____ Ft.

If > 8 feet = (5)
If ≤ 8 feet = (1)

30. _____

TOTAL SCORE OF RESOURCE POTENTIAL CATEGORY
(Sum of all scores from Resource Potential category). [ ]

Result:

_____(Island name and code number)

Development Potential _____
Recreation Potential _____
Resource Potential _____

Development Potential: Score Range = 30 (maximum) - 6 (minimum)

Scores	Level of Potential for Development
Sub-Range 1: 23-30	High
Sub-Range 2: 14-22	Medium
Sub-Range 3: 6-13	Low

Recreation Potential: Score Range = 35 (maximum) - 7 (minimum)

Scores	Level of Potential for Recreation Use
Sub-Range 1: 27-35	High
Sub-Range 2: 17-26	Medium
Sub-Range 3: 7-16	Low

Resource Potential: Score Range = 45 (maximum) - 9 (minimum)

Scores	Level of Potential for Resource Preservation Exploitation
Sub-Range 1: 34-45	High
Sub-Range 2: 21-33	Medium
Sub-Range 3: 9-20	Low

D. Ranking System

Application of the classification system produced in Phase II of this study allows the determination of the level of potential for use of a specific island resource for physical development (i.e., residential, commercial, etc.), recreation use, or resource preservation/exploitation. The product of the classification system is a list which organizes the islands into groups according to their identified potential within each of the three categories. The next step in the process is to assign a rank, or priority, to the island. The value of this is that it allows limited personnel and fiscal resources to be focused on projects which have the potential of yeilding the greatest benefit in response to an identified need or demand.

This ranking system is designed to assign a comparative ranking, or priority, to a specific island. This ranking can be produced for all islands within a specific classification group (i.e., high potential for development, low for recreating and resource categories), or all islands under a specific management responsibility. It is suggested that an initial separation of islands be accomplished according to the level of management authority identified on the Data Entry Form. This is done primarily in recognition of the fact that policy and management decisions will be made independently for each level of management responsibility. There should, therefore, be a separate ranking for each management level which includes only those islands which fall under their control.

Following the initial separation into management level groups, each island within a specific group must then be ranked according to its level of potential for development, recreation or resource use. This is easily accomplished through use of the scores produced in the classification system. All islands falling under a particular management level, and having been classified into a specific group, are then listed in a single column. The order of this column is determined by the score which the island received in the development potential category, starting at the top with the island which received the highest score descending to that which received the lowest. Adjacent to this column two more columns will be produced, comprised of the same islands utilizing the scores received in recreation

and resource potential categories form the classification system. Again, the islands will be ranked with the one receiving the highest score of the top descending to that which received the lowest score at the bottom.

The product of this is three distinct rankings of all islands from a particular classification group which are under the same management authority. The rankings are displayed adjacently so that their comparative position within the three rankings may be easily discerned.

Weighting factors can be applied to these ranks as a means of reflecting public needs or demands. Four sets of weight factors allow for the production of four alternative rankings which reflect a varying demand for each of the three categories - development, recreation and resource potential (See Ranking Table on following page). Once all the columns of the Ranking Table have been completed, it is possible to view not only the initial rankings produced through use of the classification, but also alternatives which reflect varying situations of public need and/or demand.

An example of the Ranking Table is shown on the following page.

RANKING TABLE

Management Level _____
Classification Group _____
(if applicable)

	I	II	III	IV	V	VI	VII
	Rank According To Development Score	Rank According To Recreation Score	Rank According To Resource Score	Rank Reflecting Equal Demand - Col. I x.33 + Col. II x.33 + Col.III x.33	Rank Reflecting High Development Demand - Col. I x .5 + Col. II x .25 + Col. III x .25	Rank Reflecting High Recreation Demand - Col. I x .25 + Col. II x .5 + Col. III x .25	Rank Reflecting High Resource Demand- Col. I x .25 + Col. II x .25 + Col. III x .5
high 1.							
2.							
3.							
4.							
RANK 5.							
6.							
7.							
8.							
low 9.							
10.							
(to total)							

Instructions: Enter island name and I.D. code in columns I, II and III ranking them according to the score they received in the development, recreation and resource categories in the classification system. The ranking for columns IV - VII are produced by multiplying the scoring noted in Columns I, II & III by the weight factor designated, summing the product and ordering the total from highest sum to lowest sum.

E. Summary

The three classification systems differ in both their approach to, and personnel demand for, information gathering. While all three are directed at generating data specific to island resource characteristics, only the third system allows for the use of exclusively in-house data. The recommended system was designed for effective use of the already existing Island Inventory Data, prepared by the U. S. Department of the Interior, Heritage Conservation and Recreation Service. With the additional information supplied by Division personnel within the Michigan Department of Natural Resources, a comprehensive analysis of a specific island is possible.

The value of the island classification and ranking system is that it allows the user to easily manipulate the accumulated resource characterisitc data. It should not be assumed that the product of the system is the "last word" on an island's value or best use. It does provide though a fast, repeatable, evaluation tool for making comparisons between islands. The comparisons can be as simple as just a breakdown by size, body of water, % developed, etc., or as complex as the user desires. Placing a machine-based, island resource characteristic tool in the hands of capable land use planners is a significant stride towards effective management.

F. Sample Application of Island Classification System

The following pages contain a sample application of the Island Classification System. In this particular application, Michigan's Great Lakes Islands have been sorted according to the following parameters:

- body of water in which the island is located
- size of island, in acres, listed in descending order from largest to smallest whithin each body of water
- % of development noted for each island.

The I.D. # for each island is also noted as a further means of identification. This is especially useful in those instances of islands without a name.

ISLAND CLASSIFICATIONS

WATER BODY	ISLAND NAME	I.D. #	SIZE	PERCENT DEVELOPED
LAKE HURON				
			Larger than 999 acres	
	Bois Blanc	4494		26-50%
	Marquette	4501		1-25%
	Mackinac	4495		51-75%
	Big LaSalle	4489		1-25%
			500 - 999 acres	
	Big St. Martin	4499		1-25%
			100 - 499 acres	
	Little St. Martin	4500		Undeveloped
	Little LaSalle	4490		1-25%
	Round	4497		1-25%
	Charity	4309		Undeveloped
	Middle	4300		Undeveloped
	Hiss Island	4485		26-50%
	Thunder Bay	4305		1-25%
	Government Island	4496		1-25%
	Sugar	4304		Undeveloped
	Meade	4385		1-25%
	Number Eight	4486		1-25%
	Boot	4488		1-25%
	Espandre	4354		1-25%
			10 - 99 acres	
	Strongs	4484		1-25%
	Corvell	4487		26-50%
	Goose	4493		Undeveloped
	Long	4491		1-25%
	Shelter	4384		Undeveloped
	Sulphur	4306		Undeveloped
	Crooked	4302		1-25%
	Long	4353		1-25%
	Garden	4356		Undeveloped
	Whitefish Point	4483		Undeveloped
	Bellevue	4357		Undeveloped
	Arnold	4358		Undeveloped
	Birch Island	4492		1-25%
	Boot Jack	4355		1-25%
	Little Charity	4310		Undeveloped
	Rover	4482		1-25%
	Albany	4394		76-100%
	Round	4301		Undeveloped
	Gull	4303		Undeveloped
			Less than 10 acres	
	Clark	4386		26-50% Dev.
	Silver	4387		1-25%
	Bird	4396		Undeveloped

WATER BODY	ISLAND NAME	I.D. #	SIZE	PERCENT DEVELOPED
LAKE MICHIGAN				
			Larger than 999 acres	
	Beaver	4326		1-25%
	N. Manitou	4479		1-25%
	S. Manitou	4478		1-25%
	Garden	4325		Undeveloped
	High	4322		Undeveloped
	S. Fox	4480		1-25%
	Summer	4412		1-25%
	Hog	4327		Undeveloped
	St. Martin	4408		1-25%
			500 - 999 acres	
	N. Fox	4481		1-25%
	Little Summer	4413		Undeveloped
			100 - 499 acres	
	St. Helena	4498		1-25%
	Gull Island	4320		Undeveloped
	Poverty	4411		1-25%
	Waugushance	4428		Undeveloped
	Temperance	4429		Undeveloped
			10 - 99 acres	
	Wiskey	4323		1-25%
	Trout	4321		1-25%
	Squaw	4324		1-25%
	Ol No Name	4430		Undeveloped
	Fisherman	4329		Undeveloped
	Gull	4409		Undeveloped
	Hat	4328		Undeveloped
			Less than 10 acres	
	Little Gull	4410		Undeveloped
	Rocky	4414		Undeveloped
LAKE SUPERIOR				
			Larger than 999 acres	
	Grand	4289		1-25%
	Manitou	4474		1-25%
	Isle Royal	4476		1-25%
			500 - 999 acres	
	None Identified			
			100 - 499 acres	
	Wood	4291		Undeveloped
	Au Train	4283		Undeveloped
			10 - 99 acres	
	Partridge	4516		Undeveloped
	E. Huron	4521		Undeveloped
	Beavertail Point	4503		1-25%
	Lighthouse	4519		1-25%
	Williams	4292		Undeveloped
	Porter	4473		Undeveloped
	Gull	4520		Undeveloped
	Little Presque Isle	4517		Undeveloped

WATER BODY	ISLAND NAME	I.D. #	SIZE	PERCENT DEVELOPED
LAKE SUPERIOR(Cont'd.)				
			10 - 99 acres	
	Middle	4518		Undeveloped
			Less than 10 acres	
	None Identified			
LAKE NICOLET				
			Larger than 999 acres	
	Sugar	4378		26-50%
	Neebush	4381		26-50%
			500 - 999 acres	
	None Identified			
			100 - 499 acres	
	Duck	4397		1-25%
	Island No. 1	4374		1-25%
			10 - 99 acres	
	Island No. 2	4376		26-50%
	Island No. 3	4375		Undeveloped
	No Name	4389		Undeveloped
			Less than 10 acres	
	No Name (Little Lake)	4531		76-100%
	No Name	4377		1-25%
DETROIT RIVER				
			Larger than 999 acres	
	Grosse Isle	4630		76-100%
			500 - 999 acres	
	Belle Isle	4645		1-25%
			100 - 499 acres	
	Hennepin Point	4642		Undeveloped
	Zug	4644		76-100%
	Elizabeth Park	4640		Undeveloped
	Hickory	4636		76-100%
	Stony	4639		26-50%
	Celeron	4631		1-25%
	Gibralter	4629		76-100%
			10 - 99 acres	
	Hall	4649		100%
	Round	4635		26-50%
	No Name (Gibralter Creek)	4647		Undeveloped
	Swan	4637		76-100%
	Sugar	4634		Undeveloped
	Elba	4633		76-100%
	Cherry	4648		Undeveloped
	Horse	4632		76-100%
	Edmond	4650		76-100%
			Less than 10 acres	
	Calf	4638		Undeveloped
	No Name	4641		Undeveloped
	Sturgeon Bay	4646		Undeveloped
	Grassy	4643		Undeveloped

WATER BODY	ISLAND NAME	I.D. #	SIZE	PERCENT DEVELOPED
ST. MARYS RIVER				
	Round	4395	Less than 10 acres	Undeveloped
ST. CLAIR RIVER				
	No Name	4611	100 - 499 acres	51-75%
MUNUSCONG BAY/LAKE				
	Drummond	4383	Larger than 999 acres	26-50%
	Lime Island	4349	500 - 999 acres	1-26%
	Rains	4380	100 - 499 acres	1-25%
	Sweets Point	4347		1-25%
	No Name	4371	10 - 99 acres	Undeveloped
	Moon	4390		51-75%
	Hart	4350		Undeveloped
	Lovie	4351		Undeveloped
	Little Lime	4348		Undeveloped
	Sand	4382		Undeveloped
	No Name	4372		Undeveloped
	No Name	4370	Less than 10 acres	Undeveloped
ANCHOR BAY				
	Harsen's	4608	Larger than 999 acres	26-50%
	Dickinson	4607		1-25%
	Strawberry	4610		1-25%
	No Name	4612	100 - 499 acres	Undeveloped
	No Name	4613		Undeveloped
	No Name	4614	10 - 99 acres	Undeveloped
	Gull	4609		Undeveloped
POTAGANNISSING BAY				
	None Identified		Larger than 999 acres	
	Harbor	4368	500 - 999 acres	Undeveloped
	Burnt	4340	100 - 499 acres	1-25%
	Macomb	4344		1-25%
	Wilson	4333		Undeveloped
	Maple	4341		1-25%
	Big Tent	4343	10 - 99 acres	1-25%
	Grape	4364		1-25%
	Bald	4366		1-25%
	Cass	4346		1-25%
	Rutland	4360		Undeveloped

WATER BODY	ISLAND NAME	I.D. #	SIZE	PERCENT DEVELOPED
POTAGANNISSING BAY(Cont'd.)				
	Cedar	4332		Undeveloped
	Ashman	4362		Undeveloped
	Boulanger	4367		1-25%
	Peck	4361		1-25%
	Butterfield	4342		1-25%
	Stricklands Point	4334		26-50%
	Rogg	4365		Undeveloped
	James	4359		1-25%
	LaPointe	4363		1-25%
	Standerson	4369		Undeveloped
	Saltonstall	4336		Undeveloped
	Long	4337		Undeveloped
	Gull	4335		Undeveloped
	Andrews	4345		76-100%
	Pipe	4373		76-100%
	Harris	4338		Undeveloped
			Less than 10 acres	
	Claw	4339		Undeveloped
NORTH MAUMEE BAY				
			Larger than 999 acres	
	None Identified			
			500 - 999 ares	
	None Identified			
			100 - 499 acres	
	Indian Island	4547		Undeveloped
			10 - 99 acres	
	Guard Island	4549		1-26%
	Odiem	4548		Undeveloped
	No Name	4592		Undeveloped
	North Maumee	4550		Undeveloped
SAGINAW BAY				
			Larger than 999 acres	
	None Identified			
			500 - 999 ares	
	Katechay	4454		Undeveloped
	Maison	4455		Undeveloped
			100 - 499 acres	
	Stony Island	4455		Undeveloped
	Heisterman	4453		Undeveloped
	S. Mineshas	4452		Undeveloped
	Lone Tree	4450		Undeveloped
			10 - 99 acres	
	North	4456		1-25%
	N. Mineshas	4449		Undeveloped
	Defoe	4448		Undeveloped
	No Name	4312		Undeveloped
			Less than 10 acres	
	None Identified			

WATER BODY	ISLAND NAME	I.D. #	SIZE	PERCENT DEVELOPED
OTHER				
			500 - 999 acres	
Grand Traverse Bay				
	Marion Isl.	4439		1-25%
			100 - 499 acres	
West Neebush Channel				
	Sand Island	4379		1-25%
			10 - 99 acres	
Keweenaw Bay				
	Traverse Island	4447		Undeveloped
Whitney Bay				
	No Name	4393		Undeveloped
Big Bay Denoc				
	Round Island	4416		Undeveloped
	St. Vitals	4417		Undeveloped
			Less than 10 acres	
Whitney Bay				
	Duck	4392		1-25%
Little Island Bay				
	No Name	4626		Undeveloped
Big Bay Denoc				
	Snake	4415		Undeveloped

G. Sample Application of Island Ranking System

The following pages contain a sample application of the Island Ranking System. The values used to produce the relative rankings are those generated by the Island Classification System. The first three columns contain island rankings according to scores or values generated for Development Potential, Recreation Potential and Resource Potential. Following these are two columns which utilize weight factors to produce rankings reflecting different levels of demand for the categories - development, recreation and resource. Examination of the Ranking System Table on Page A-32 of this document reveals that four weighted rankings are produced through application of this system. Only two are shown here due to difficulty with reproduction.

ISLAND MANAGEMENT RANKING TABLE

RANK ACCORDING TO DEVELOPMENT SCORE	RANK ACCORDING TO RECREATION SCORE	RANK ACCORDING TO RESOURCE SCORE	RANK REFLECTING EQUAL DEMAND (COL.I X 0.33 + COL.II X 0.33 + COL.III X 0.33)	RANK REFLECTING HIGH DEVELOPEMNT (COL.I X .25 + COL. II X .50 + COL.III X .25 +
HOG IS. (PART OF BEA	ISLE ROYALE NATIONAL	SOUTH MANITOU ISLAND	SOUTH MANITOU ISLAND	SOUTH MANITOU ISLAND
4327 SCORE= 18.5	4476 SCORE= 30.0	4478 SCORE= 17.0	4478 SCORE= 19.3	4478 SCORE= 21.1
HIGH IS. (PART OF BE	SILVER ISLAND	SUGAR ISLAND	BEAVER ISLAND (PART	BEAVER ISLAND (PART
4322 SCORE= 18.5	4387 SCORE= 26.0	4634 SCORE= 17.0	4326 SCORE= 19.3	4326 SCORE= 21.1
GARDEN IS. (PART OF	SOUTH MANITOU ISLAND	TEMPERANCE ISLAND	HIGH IS. (PART OF BE	ST MARTIN ISLAND
4325 SCORE= 18.5	4478 SCORE= 26.0	4429 SCORE= 16.0	4322 SCORE= 18.3	4408 SCORE= 19.6
BIG LA SALLE ISLAND	BEAVER ISLAND (PART	ST MARTIN ISLAND	ST MARTIN ISLAND	MARION ISLAND
4489 SCORE= 17.5	4326 SCORE= 26.0	4408 SCORE= 16.0	4408 SCORE= 18.0	4439 SCORE= 19.1
MACKINAC ISLAND	ISLAND NO. 1	HIGH IS. (PART OF BE	HOG IS. (PART OF BEA	SUMMER ISLAND
4495 SCORE= 17.5	4374 SCORE= 26.0	4322 SCORE= 16.0	4327 SCORE= 18.0	4412 SCORE= 19.1
BOIS BLANC	CLARK ISLAND	BEAVER ISLAND (PART	SUGAR ISLAND	HIGH IS. (PART OF BE
4494 SCORE= 17.5	4386 SCORE= 25.0	4326 SCORE= 16.0	4378 SCORE= 17.7	4322 SCORE= 19.1
GULL ISLAND (PART OF	STONY ISLAND	CELEPON ISLAND	MARION ISLAND	DRUMMOND ISLAND
4320 SCORE= 16.5	4639 SCORE= 25.0	4631 SCORE= 16.0	4439 SCORE= 17.3	4383 SCORE= 19.1
BEAVER ISLAND (PART	NOON ISLAND	NEEBISH ISLAND	SUMMER ISLAND	BELLE ISLE
4326 SCORE= 16.5	4390 SCORE= 24.0	4381 SCORE= 16.0	4412 SCORE= 17.3	4645 SCORE= 19.1
DUCK ISLAND	JAMES ISLAND	01 NO NAME	GARDEN IS. (PART OF	SUGAR ISLAND
4397 SCORE= 16.5	4359 SCORE= 24.0	4592 SCORE= 15.0	4325 SCORE= 17.3	4378 SCORE= 19.1
01 NO NAME	BOULANGER ISLAND	01 NO NAME	DRUMMOND ISLAND	ISLE ROYALE NATIONAL
4626 SCORE= 15.5	4367 SCORE= 24.0	4393 SCORE= 15.0	4383 SCORE= 17.3	4476 SCORE= 19.0
01 NO NAME	CASS ISLAND	SQUAW ISLAND (PART O	CELERON ISLAND	HOG IS. (PART OF BEA
4592 SCORE= 15.5	4346 SCORE= 24.0	4324 SCORE= 15.0	4631 SCORE= 17.3	4327 SCORE= 18.9
01 NO NAME	BALD ISLAND	TROUT ISLAND (PART O	BELLE ISLE	ST. HELENA IS.
4393 SCORE= 15.5	4366 SCORE= 24.0	4321 SCORE= 15.0	4645 SCORE= 17.3	4498 SCORE= 18.6
SWEETS POINT ISLAND	MARION ISLAND	WISKEY ISLAND (PART	01 NO NAME	CELEPON ISLAND
4347 SCORE= 15.5	4439 SCORE= 24.0	4323 SCORE= 15.0	4592 SCORE= 17.0	4631 SCORE= 18.6
LITTLE PRESQUE ISLE	UNNAMED (BOOTJACK IS	GULL ISLAND (PART OF	TEMPERANCE ISLAND	JAMES ISLAND
4517 SCORE= 15.5	4355 SCORE= 24.0	4320 SCORE= 15.0	4429 SCORE= 17.0	4359 SCORE= 18.4

ISLAND MANAGEMENT RANKING TABLE

RANK ACCORDING TO DEVELOPMENT SCORE	RANK ACCORDING TO RECREATION SCORE	RANK ACCORDING TO RESOURCE SCORE	RANK REFLECTING EQUAL DEMAND (COL.I X 0.33 + COL.II X 0.33 + COL.III X 0.33)	RANK REFLECTING HIGH DEVELOPEMNT (COL.I X .25 + COL. II X .50 + COL.III X .25 +
SQUAW ISLAND (PART O	CROOKED ISLAND	HOG IS. (PART OF BEA	BIG LA SALLE ISLAND	CASS ISLAND
4324 SCORE= 15.5	4302 SCORE= 24.0	4327 SCORE= 15.0	4489 SCORE= 17.0	4346 SCORE= 18.4
TROUT ISLAND (PART O	THUNDER BAY ISLAND	GARDEN IS. (PART OF	SOUTH FOX ISLAND	BIG LA SALLE ISLAND
4321 SCORE= 15.5	4305 SCORE= 24.0	4325 SCORE= 15.0	4480 SCORE= 17.0	4489 SCORE= 18.4
WISKEY ISLAND (PART	ST. HELENA IS.	SUGAR ISLAND	GRAND ISLAND	SOUTH FOX ISLAND
4323 SCORE= 15.5	4498 SCORE= 24.0	4378 SCORE= 15.0	4289 SCORE= 17.0	4480 SCORE= 18.4
LITTLE LA SALLE (PAR	ST MARTIN ISLAND	01 NO NAME	NORTH MANITOU ISLAND	GRAND ISLAND
4490 SCORE= 15.5	4408 SCORE= 24.0	4626 SCORE= 14.0	4479 SCORE= 17.0	4289 SCORE= 18.4
BIG ST. MARTIN IS.	SUMMER ISLAND	DUCK ISLAND	DUCK ISLAND	NORTH MANITOU ISLAND
4499 SCORE= 15.5	4412 SCORE= 24.0	1392 SCORE= 14.0	4397 SCORE= 17.0	4479 SCORE= 18.4
SUMMER ISLAND	DRUMMOND ISLAND	LITTLE LIME ISLAND	LIME ISLAND	DUCK ISLAND
4412 SCORE= 15.5	4383 SCORE= 24.0	4348 SCORE= 14.0	4349 SCORE= 16.7	4397 SCORE= 18.4
SOUTH FOX ISLAND	01 NO NAME	ST. VITALS	TROUT ISLAND (PART O	01 NO NAME
4480 SCORE= 15.5	4611 SCORE= 24.0	4417 SCORE= 14.0	4321 SCORE= 16.7	4592 SCORE= 18.1
MARQUETTE IS. (PART	BELLE ISLE	JAMES ISLAND	ST. HELENA IS.	BOULANGER ISLAND
4501 SCORE= 15.5	4645 SCORE= 24.0	4359 SCORE= 14.0	4498 SCORE= 16.7	4367 SCORE= 18.1
SOUTH MANITOU ISLAND	01 NO NAME	BUTTERFIELD ISLAND	NORTH FOX ISLAND	BALD ISLAND
4478 SCORE= 15.5	4398 SCORE= 23.0	4342 SCORE= 14.0	4481 SCORE= 16.7	4366 SCORE= 18.1
GRAND ISLAND	01 NO NAME	CASS ISLAND	NEEBISH ISLAND	LIME ISLAND
4289 SCORE= 15.5	4370 SCORE= 23.0	4346 SCORE= 14.0	4381 SCORE= 16.7	4349 SCORE= 18.1
NORTH MANITOU ISLAND	01 NO NAME	GUARD IS.	JAMES ISLAND	UNNAMED (BOOTJACK IS
4479 SCORE= 15.5	4372 SCORE= 23.0	4549 SCORE= 14.0	4359 SCORE= 16.3	4355 SCORE= 18.1
DRUMMOND ISLAND	01 NO NAME	NORTH ISLAND	01 NO NAME	TEMPERANCE ISLAND
4383 SCORE= 15.5	4312 SCORE= 23.0	4456 SCORE= 14.0	4393 SCORE= 16.3	4429 SCORE= 18.1
BELLE ISLE	SAND ISLAND	WILSON ISLAND	CASS ISLAND	WAUGOSHANE ISLAND
4645 SCORE= 15.5	4382 SCORE= 23.0	4333 SCORE= 14.0	4346 SCORE= 16.3	4428 SCORE= 18.1
NEEBISH ISLAND	STANDERSON ISLAND	MACOMB ISLAND	WAUGOSHANE ISLAND	NORTH FOX ISLAND
4381 SCORE= 15.5	4369 SCORE= 23.0	4344 SCORE= 14.0	4428 SCORE= 16.3	4481 SCORE= 18.1

ISLAND MANAGEMENT RANKING TABLE

RANK ACCORDING TO DEVELOPMENT SCORE	RANK ACCORDING TO RECREATION SCORE	RANK ACCORDING TO RESOURCE SCORE	RANK REFLECTING EQUAL DEMAND (COL.I X 0.33 + COL.II X 0.33 + COL.III X 0.33)	RANK REFLECTING HIGH DEVELOPEMNT (COL.I X .25 + COL. II X .50 + COL.III X .25 +
SUGAR ISLAND 4378 SCORE= 15.5	01 NO NAME 4371 SCORE= 23.0	RAINS ISLAND 4380 SCORE= 14.0	HILL ISLAND (PART OF 4485 SCORE= 16.3	CHARITY IS 4309 SCORE= 17.9
SNAKE ISLAND 4415 SCORE= 14.5	01 (NO NAME 4614 SCORE= 23.0	BURNT ISLAND 4340 SCORE= 14.0	MACKINAC ISLAND 4495 SCORE= 16.3	GARDEN IS. (PART OF 4325 SCORE= 17.9
MARION ISLAND 4439 SCORE= 14.5	SAND ISLAND 4379 SCORE= 23.0	MARION ISLAND 4439 SCORE= 14.0	01 NO NAME 4626 SCORE= 16.0	NORTH ISLAND 4456 SCORE= 17.6
KATECHAY ISLAND, MAI 4454 SCORE= 14.5	BIRD ISLAND 4396 SCORE= 23.0	HARBOR ISLAND 4368 SCORE= 14.0	BOULANGER ISLAND 4367 SCORE= 16.0	MACOMB ISLAND 4344 SCORE= 17.6
LIME ISLAND 4349 SCORE= 14.5	GULL ISLAND 4303 SCORE= 23.0	LIME ISLAND 4349 SCORE= 14.0	BALD ISLAND 4366 SCORE= 16.0	TROUT ISLAND (PART O 4321 SCORE= 17.6
BEAVERTAIL POINT 4503 SCORE= 14.5	HAT ISLAND 4328 SCORE= 23.0	HILL ISLAND (PART OF 4485 SCORE= 14.0	NORTH ISLAND 4456 SCORE= 16.0	ISLAND NO. 8 (PART O 4486 SCORE= 17.6
CORVELL ISLAND (PART 4487 SCORE= 14.5	MIDDLE IS. 4518 SCORE= 23.0	LITTLE LA SALLE (PAR 4490 SCORE= 14.0	MACOMB ISLAND 4344 SCORE= 16.0	THUNDER BAY ISLAND 4305 SCORE= 17.6
TEMPERANCE ISLAND 4429 SCORE= 14.5	ROUND ISLAND 4301 SCORE= 23.0	NORTH FOX ISLAND 4481 SCORE= 14.0	HARBOR ISLAND 4368 SCORE= 16.0	HILL ISLAND (PART OF 4485 SCORE= 17.6
WAUGOSHANE ISLAND 4428 SCORE= 14.5	ALBANY ISLAND 4394 SCORE= 23.0	MACKINAC ISLAND 4495 SCORE= 14.0	UNNAMED (BOOTJACK IS 4355 SCORE= 16.0	BIG (TROUT ISLAND 4343 SCORE= 17.4
BOOT ISLAND (PART OF 4488 SCORE= 14.5	FISHERMAN ISLAND 4329 SCORE= 23.0	SOUTH FOX ISLAND 4480 SCORE= 14.0	SQUAW ISLAND (PART O 4324 SCORE= 16.0	HARBOR ISLAND 4368 SCORE= 17.4
HILL ISLAND (PART OF 4485 SCORE= 14.5	PORTER ISLAND 4473 SCORE= 23.0	GRAND ISLAND 4289 SCORE= 14.0	CORVELL ISLAND (PART 4487 SCORE= 16.0	CORVELL ISLAND (PART 4487 SCORE= 17.4
LITTLE SUMMER ISLAND 4413 SCORE= 14.5	01 NO NAME 4430 SCORE= 23.0	NORTH MANITOU ISLAND 4479 SCORE= 14.0	WISKEY ISLAND (PART 4323 SCORE= 16.0	ESPANORE ISLAND 4354 SCORE= 17.4
NORTH FOX ISLAND 4481 SCORE= 14.5	SULPHUR 4306 SCORE= 23.0	GRASSY ISLANDS 4643 SCORE= 14.0	ISLAND NO. 8 (PART O 4486 SCORE= 16.0	POVERTY ISLAND 4411 SCORE= 17.4
MANITOU ISLAND 4474 SCORE= 14.5	GOOSE ISLAND (PART O 4493 SCORE= 23.0	STURGEON BAR ISLAND 4646 SCORE= 14.0	GULL ISLAND (PART OF 4320 SCORE= 16.0	ROUND IS. 4497 SCORE= 17.4

ISLAND MANAGEMENT RANKING TABLE

RANK ACCORDING TO DEVELOPMENT SCORE	RANK ACCORDING TO RECREATION SCORE	RANK ACCORDING TO RESOURCE SCORE	RANK REFLECTING EQUAL DEMAND (COL.I X 0.33 + COL.II X 0.33 + COL.III X 0.33)	RANK REFLECTING HIGH DEVELOPEMNT (COL.I X .25 + COL. II X .50 + COL.III X .25 +
ST MARTIN ISLAND 4408 SCORE= 14.5	WAUGOSHANE ISLAND 4428 SCORE= 23.0	SNAKE ISLAND 4415 SCORE= 13.0	CHARITY IS 4309 SCORE= 16.0	ISLAND NO. 1 4374 SCORE= 17.4
CELERON ISLAND 4631 SCORE= 14.5	CHARITY IS 4309 SCORE= 23.0	PIPE ISLAND 4373 SCORE= 13.0	BIG TROUT ISLAND 4343 SCORE= 15.7	NEEBISH ISLAND 4381 SCORE= 17.4
PIPE ISLAND 4373 SCORE= 13.5	CALF ISLAND 4638 SCORE= 23.0	GULL ISLAND 4335 SCORE= 13.0	WILSON ISLAND 4333 SCORE= 15.7	01 NO NAME 4393 SCORE= 17.1
ST. VITALS 4417 SCORE= 13.5	ROUND ISLAND 4395 SCORE= 23.0	SALTONSTALL ISLAND 4336 SCORE= 13.0	LITTLE PRESQUE ISLE 4517 SCORE= 15.7	GRAPE ISLAND 4364 SCORE= 17.1
HART ISLAND 4350 SCORE= 13.5	EDMOND ISLAND 4650 SCORE= 23.0	GRAVEL ISLAND 4352 SCORE= 13.0	ESPANORE ISLAND 4354 SCORE= 15.7	SWEETS POINT ISLAND 4347 SCORE= 17.1
SOUTH MINESHAS ISLAN 4452 SCORE= 13.5	HORSE ISLAND 4632 SCORE= 23.0	HART ISLAND 4350 SCORE= 13.0	POVERTY ISLAND 4411 SCORE= 15.7	WILSON ISLAND 4333 SCORE= 17.1
STONY ISLAND, HEISTE 4455 SCORE= 13.5	ELBA ISLAND 4633 SCORE= 23.0	LA POINTE ISLAND 4363 SCORE= 13.0	ROUND IS. 4497 SCORE= 15.7	MANITOU ISLAND 4474 SCORE= 17.1
HARBOR ISLAND 4368 SCORE= 13.5	SWAN ISLAND 4637 SCORE= 23.0	ROUND ISLAND 4416 SCORE= 13.0	LITTLE LA SALLE (PAR 4490 SCORE= 15.7	01 NO NAME 4626 SCORE= 16.9
ALBANY ISLAND 4394 SCORE= 13.5	HALL ISLAND 4649 SCORE= 23.0	ROGG ISLAND 4365 SCORE= 13.0	SNAKE ISLAND 4415 SCORE= 15.3	EAST HURON IS. PART 4521 SCORE= 16.9
ROVER ISLAND (PART O 4482 SCORE= 13.5	GIBIALTOR ISLAND 4629 SCORE= 23.0	PECK ISLAND 4361 SCORE= 13.0	ST. VITALS 4417 SCORE= 15.3	MACKINAC ISLAND 4495 SCORE= 16.9
BIRCH ISLAND (PART O 4492 SCORE= 13.5	HICKORY ISLAND 4636 SCORE= 23.0	BOULANGER ISLAND 4367 SCORE= 13.0	BURNT ISLAND 4340 SCORE= 15.3	GRASSY ISLANDS 4643 SCORE= 16.7
WHITEFISH POINT ISLA 4483 SCORE= 13.5	ELIZABETH PARK 4640 SCORE= 23.0	ASHMAN ISLAND 4362 SCORE= 13.0	EAST HURON IS. PART 4521 SCORE= 15.3	GULL ISLAND 4335 SCORE= 16.6
WILLIAMS ISLAND 4292 SCORE= 13.5	ZUG ISLAND 4644 SCORE= 23.0	CEDAR ISLAND 4332 SCORE= 13.0	LITTLE SUMMER ISLAND 4413 SCORE= 15.3	ROGG ISLAND 4365 SCORE= 16.6
CROOKED ISLAND 4302 SCORE= 13.5	HENNEPIN POINT 4642 SCORE= 23.0	RUTLAND ISLAND 4360 SCORE= 13.0	BIG ST. MARTIN IS. 4499 SCORE= 15.3	ASHMAN ISLAND 4362 SCORE= 16.6

ISLAND MANAGEMENT RANKING TABLE

RANK ACCORDING TO DEVELOPMENT SCORE	RANK ACCORDING TO RECREATION SCORE	RANK ACCORDING TO RESOURCE SCORE	RANK REFLECTING EQUAL DEMAND (COL.I X 0.33 + COL.II X 0.33 + COL.III X 0.33)	RANK REFLECTING HIGH DEVELOPEMNT (COL.I X .25 + COL. II X .50 + COL.III X .25 +
LONG ISLAND (PART OF 4491 SCORE= 13.5	GRASSE ISLE 4630 SCORE= 23.0	BALD ISLAND 4366 SCORE= 13.0	SUGAR ISLAND 4634 SCORE= 15.3	CEDAR ISLAND 4332 SCORE= 16.6
PARTRIDGE IS. 4516 SCORE= 13.5	01 NO NAME 4531 SCORE= 23.0	GRAPE ISLAND 4364 SCORE= 13.0	GRAPE ISLAND 4364 SCORE= 15.3	RUTLAND ISLAND 4360 SCORE= 16.6
AU TRAIN IS 4283 SCORE= 13.5	01 NO NAME 4389 SCORE= 23.0	BIG TROUT ISLAND 4343 SCORE= 13.0	SWEETS POINT ISLAND 4347 SCORE= 15.3	BURNT ISLAND 4340 SCORE= 16.6
ISLAND NO. 8 (PART O 4486 SCORE= 13.5	ISLAND NO. 3 4375 SCORE= 23.0	MAPLE ISLAND 4341 SCORE= 13.0	THUNDER BAY ISLAND 4305 SCORE= 15.3	LITTLE PRESQUE ISLE 4517 SCORE= 16.6
WOOD ISLAND 4291 SCORE= 13.5	SUGAR ISLAND 4378 SCORE= 23.0	ROCKY ISLAND 4414 SCORE= 13.0	MANITOU ISLAND 4474 SCORE= 15.3	CROOKED ISLAND 4302 SCORE= 16.6
SUGAR ISLAND 4304 SCORE= 13.5	GRAPE ISLAND 4364 SCORE= 22.0	LITTLE GULL ISLAND 4410 SCORE= 13.0	BOIS BLANC 4494 SCORE= 15.3	SQUAW ISLAND (PART O 4324 SCORE= 16.6
GOVERNMENT ISLAND (P 4496 SCORE= 13.5	NORTH ISLAND 4456 SCORE= 22.0	GULL ISLAND 4409 SCORE= 13.0	ISLE ROYALE NATIONAL 4476 SCORE= 15.1	WISKEY ISLAND (PART 4323 SCORE= 16.6
THUNDER BAY ISLAND 4305 SCORE= 13.5	BIG TROUT ISLAND 4343 SCORE= 22.0	LITTLE PRESQUE ISLE 4517 SCORE= 13.0	LITTLE LIME ISLAND 4348 SCORE= 15.0	SNAKE ISLAND 4415 SCORE= 16.4
ST. HELENA IS. 4498 SCORE= 13.5	SWEETS POINT ISLAND 4347 SCORE= 22.0	GULL IS. 4520 SCORE= 13.0	HART ISLAND 4350 SCORE= 15.0	ST. VITALS 4417 SCORE= 16.4
MIDDLE ISLAND 4300 SCORE= 13.5	MACOMB ISLAND 4344 SCORE= 22.0	ROVER ISLAND (PART O 4482 SCORE= 13.0	WILLIAMS ISLAND 4292 SCORE= 15.0	LIGHTHOUSE IS. (PART 4519 SCORE= 16.4
LITTLE ST. MARTIN IS 4500 SCORE= 13.5	LIME ISLAND 4349 SCORE= 22.0	UNNAMED (BOOTJACK IS 4355 SCORE= 13.0	LIGHTHOUSE IS. (PART 4519 SCORE= 15.0	MEADE ISLAND 4385 SCORE= 16.4
ROUND ISLAND 4635 SCORE= 13.5	STRAWBERRY ISLAND 4610 SCORE= 22.0	BIRCH ISLAND (PART O 4492 SCORE= 13.0	PARTRIDGE IS. 4516 SCORE= 15.0	GULL ISLAND (PART OF 4320 SCORE= 16.4
01 NO NAME 4377 SCORE= 13.5	DICKINSON ISLAND 4607 SCORE= 22.0	ARNOLD ISLAND 4358 SCORE= 13.0	AU TRAIN IS 4283 SCORE= 15.0	LITTLE LA SALLE (PAR 4490 SCORE= 16.4
ISLAND NO. 2 4376 SCORE= 13.5	ESPANORE ISLAND 4354 SCORE= 22.0	BELLEVUE ISLAND 4357 SCORE= 13.0	BOOT ISLAND (PART OF 4488 SCORE= 15.0	LITTLE SUMMER ISLAND 4413 SCORE= 16.4

ISLAND MANAGEMENT RANKING TABLE

RANK ACCORDING TO DEVELOPMENT SCORE	RANK ACCORDING TO RECREATION SCORE	RANK ACCORDING TO RESOURCE SCORE	RANK REFLECTING EQUAL DEMAND (COL.I X 0.33 + COL.II X 0.33 + COL.III X 0.33)	RANK REFLECTING HIGH DEVELOPEMNT (COL.I X .25 + COL. II X .50 + COL.III X .25 +
ANDREWS ISLAND 4345 SCORE= 12.5	ISLAND NO. 8 (PART O 4486 SCORE= 22.0	WHITEFISH POINT ISLA 4483 SCORE= 13.0	MEADE ISLAND 4395 SCORE= 15.0	BOIS BLANC 4494 SCORE= 16.4
NORTH MINESHAS ISLAN 4453 SCORE= 12.5	POVERTY ISLAND 4411 SCORE= 22.0	WILLIAMS ISLAND 4292 SCORE= 13.0	WOOD ISLAND 4291 SCORE= 15.0	LITTLE LIME ISLAND 4348 SCORE= 16.1
LITTLE LIME ISLAND 4348 SCORE= 12.5	ROUND IS. 4497 SCORE= 22.0	GARDEN ISLAND 4356 SCORE= 13.0	MARQUETTE IS. (PART 4501 SCORE= 15.0	HART ISLAND 4350 SCORE= 16.1
ROUND ISLAND 4416 SCORE= 12.5	NORTH FOX ISLAND 4481 SCORE= 22.0	LONG ISLAND 4353 SCORE= 13.0	GULL ISLAND 4335 SCORE= 15.0	LA POINTE ISLAND 4363 SCORE= 16.1
NORTH ISLAND 4456 SCORE= 12.5	BIG LA SALLE ISLAND 4489 SCORE= 22.0	LIGHTHOUSE IS. (PART 4519 SCORE= 13.0	ROGG ISLAND 4365 SCORE= 15.0	PECK ISLAND 4361 SCORE= 16.1
TRAVERSE ISLAND 4447 SCORE= 12.5	MANITOU ISLAND 4474 SCORE= 22.0	SHELTER ISLAND 4384 SCORE= 13.0	ASHMAN ISLAND 4362 SCORE= 15.0	WILLIAMS ISLAND 4292 SCORE= 16.1
BIG TROUT ISLAND 4343 SCORE= 12.5	SOUTH FOX ISLAND 4480 SCORE= 22.0	LONG ISLAND (PART OF 4491 SCORE= 13.0	CEDAR ISLAND 4332 SCORE= 15.0	LONG ISLAND 4353 SCORE= 16.1
MAPLE ISLAND 4341 SCORE= 12.5	GRAND ISLAND 4289 SCORE= 22.0	EAST HURON IS. PART 4521 SCORE= 13.0	RUTLAND ISLAND 4360 SCORE= 15.0	PARTRIDGE IS. 4516 SCORE= 16.1
WILSON ISLAND 4333 SCORE= 12.5	NORTH MANITOU ISLAND 4479 SCORE= 22.0	CORVELL ISLAND (PART 4487 SCORE= 13.0	GRASSY ISLANDS 4643 SCORE= 14.8	AU TRAIN IS 4283 SCORE= 16.1
MACOMB ISLAND 4344 SCORE= 12.5	GRASSY ISLANDS 4643 SCORE= 22.0	PARTRIDGE IS. 4516 SCORE= 13.0	ROUND ISLAND 4416 SCORE= 14.7	WOOD ISLAND 4291 SCORE= 16.1
RAINS ISLAND 4380 SCORE= 12.5	CELERON ISLAND 4631 SCORE= 22.0	STRONGS ISLAND (PART 4484 SCORE= 13.0	RAINS ISLAND 4380 SCORE= 14.7	BIG ST. MARTIN IS. 4499 SCORE= 16.1
BURNT ISLAND 4340 SCORE= 12.5	DUCK ISLAND 4397 SCORE= 22.0	AU TRAIN IS 4283 SCORE= 13.0	ROCKY ISLAND 4414 SCORE= 14.7	ROUND ISLAND 4416 SCORE= 15.9
ROCKY ISLAND 4414 SCORE= 12.5	01 NO NAME 4592 SCORE= 21.0	ESPANORE ISLAND 4354 SCORE= 13.0	ROVER ISLAND (PART O 4482 SCORE= 14.7	SILVER ISLAND 4387 SCORE= 15.9
PORTER ISLAND 4473 SCORE= 12.5	ANDREWS ISLAND 4345 SCORE= 21.0	BOOT ISLAND (PART OF 4488 SCORE= 13.0	BIRCH ISLAND (PART O 4492 SCORE= 14.7	ROCKY ISLAND 4414 SCORE= 15.9

ISLAND MANAGEMENT RANKING TABLE

RANK ACCORDING TO DEVELOPMENT SCORE	RANK ACCORDING TO RECREATION SCORE	RANK ACCORDING TO RESOURCE SCORE	RANK REFLECTING EQUAL DEMAND (COL.I X 0.33 + COL.II X 0.33 + COL.III X 0.33)	RANK REFLECTING HIGH DEVELOPEMNT (COL.I X .25 + COL. II X .50 + COL.III X .25 +
ARNOLD ISLAND 4358 SCORE= 12.5	GULL ISLAND 4335 SCORE= 21.0	ISLAND NO. 8 (PART O 4486 SCORE= 13.0	BEAVERTAIL POINT 4503 SCORE= 14.7	BOOT ISLAND (PART OF 4488 SCORE= 15.9
BELLEVUE ISLAND 4357 SCORE= 12.5	ROGG ISLAND 4365 SCORE= 21.0	MEADE ISLAND 4385 SCORE= 13.0	LONG ISLAND (PART OF 4491 SCORE= 14.7	MARQUETTE IS. (PART 4501 SCORE= 15.9
GARDEN ISLAND 4356 SCORE= 12.5	ASHMAN ISLAND 4362 SCORE= 21.0	WOOD ISLAND 4291 SCORE= 13.0	01 NO NAME 4377 SCORE= 14.7	SUGAR ISLAND 4634 SCORE= 15.9
LIGHTHOUSE IS. (PART 4519 SCORE= 12.5	CEDAR ISLAND 4332 SCORE= 21.0	POVERTY ISLAND 4411 SCORE= 13.0	LA POINTE ISLAND 4363 SCORE= 14.7	RAINS ISLAND 4380 SCORE= 15.6
EAST HURON IS. PART 4521 SCORE= 12.5	RUTLAND ISLAND 4360 SCORE= 21.0	GOVERNMENT ISLAND (P 4496 SCORE= 13.0	PECK ISLAND 4361 SCORE= 14.7	KATECHAY ISLAND, MAI 4454 SCORE= 15.6
STRONGS ISLAND (PART 4484 SCORE= 12.5	WILSON ISLAND 4333 SCORE= 21.0	ST. HELENA IS. 4498 SCORE= 13.0	LONG ISLAND 4353 SCORE= 14.7	DICKINSON ISLAND 4607 SCORE= 15.6
ESPANOPE ISLAND 4354 SCORE= 12.5	HARBOR ISLAND 4368 SCORE= 21.0	CHARITY IS 4309 SCORE= 13.0	MAPLE ISLAND 4341 SCORE= 14.4	LITTLE GULL ISLAND 4410 SCORE= 15.6
MEADE ISLAND 4385 SCORE= 12.5	HARSEN'S ISLAND 4608 SCORE= 21.0	ROUND IS. 4497 SCORE= 13.0	WHITEFISH POINT ISLA 4483 SCORE= 14.4	GULL ISLAND 4409 SCORE= 15.6
POVERTY ISLAND 4411 SCORE= 12.5	EAST HURON IS. PART 4521 SCORE= 21.0	LITTLE ST. MARTIN IS 4500 SCORE= 13.0	STRONGS ISLAND (PART 4484 SCORE= 14.4	ROVER ISLAND (PART O 4482 SCORE= 15.6
CHARITY IS 4309 SCORE= 12.5	CORVELL ISLAND (PART 4487 SCORE= 21.0	LITTLE SUMMER ISLAND 4413 SCORE= 13.0	GOVERNMENT ISLAND (P 4496 SCORE= 14.4	BIRCH ISLAND (PART O 4492 SCORE= 15.6
ROUND IS. 4497 SCORE= 12.5	TEMPERANCE ISLAND 4429 SCORE= 21.0	BIG ST. MARTIN IS. 4499 SCORE= 13.0	LITTLE ST. MARTIN IS 4500 SCORE= 14.4	BEAVERTAIL POINT 4503 SCORE= 15.6
SUGAR ISLAND 4634 SCORE= 12.5	HILL ISLAND (PART OF 4485 SCORE= 21.0	SUMMER ISLAND 4412 SCORE= 13.0	ISLAND NO. 2 4376 SCORE= 14.4	LONG ISLAND (PART OF 4491 SCORE= 15.6
GRASSE ISLE 4630 SCORE= 12.5	MIDDLE ISLAND 4300 SCORE= 21.0	DRUMMOND ISLAND 4383 SCORE= 13.0	BUTTERFIELD ISLAND 4342 SCORE= 14.4	STONY ISLAND 4639 SCORE= 15.6
CLAW ISLAND 4339 SCORE= 11.5	HOG IS. (PART OF BEA 4327 SCORE= 21.0	01 NO NAME 4641 SCORE= 13.0	KATECHAY ISLAND, MAI 4454 SCORE= 14.4	01 NO NAME 4377 SCORE= 15.6

ISLAND MANAGEMENT RANKING TABLE

RANK ACCORDING TO DEVELOPMENT SCORE	RANK ACCORDING TO RECREATION SCORE	RANK ACCORDING TO RESOURCE SCORE	RANK REFLECTING EQUAL DEMAND (COL.I X 0.33 + COL.II X 0.33 + COL.III X 0.33)	RANK REFLECTING HIGH DEVELOPEMNT (COL.I X .25 + COL. II X .50 + COL. III X .25 +
HARRIS ISLAND 4338 SCORE= 11.5	HIGH IS. (PART OF BE 4322 SCORE= 21.0	BELLE ISLE 4645 SCORE= 13.0	LITTLE GULL ISLAND 4410 SCORE= 14.4	ANDREWS ISLAND 4345 SCORE= 15.4
GULL ISLAND 4335 SCORE= 11.5	LA POINTE ISLAND 4363 SCORE= 20.0	01 NO NAME 4377 SCORE= 13.0	GULL ISLAND 4409 SCORE= 14.4	BUTTERFIELD ISLAND 4342 SCORE= 15.4
LONG ISLAND 4337 SCORE= 11.5	PECK ISLAND 4361 SCORE= 20.0	ISLAND NO. 2 4376 SCORE= 13.0	ISLAND NO. 1 4374 SCORE= 14.4	MAPLE ISLAND 4341 SCORE= 15.4
SALTONSTALL ISLAND 4336 SCORE= 11.5	BURNT ISLAND 4340 SCORE= 20.0	DUCK ISLAND 4397 SCORE= 13.0	ARNOLD ISLAND 4358 SCORE= 14.0	STONY ISLAND, HEISTE 4455 SCORE= 15.4
GRAVEL ISLAND 4352 SCORE= 11.5	LONG ISLAND 4353 SCORE= 20.0	BEAVERTAIL POINT 4503 SCORE= 12.0	BELLEVUE ISLAND 4357 SCORE= 14.0	HARSEN'S ISLAND 4608 SCORE= 15.4
LOVE ISLAND 4351 SCORE= 11.5	LIGHTHOUSE IS. (PART 4519 SCORE= 20.0	WAUGOSHANE ISLAND 4428 SCORE= 12.0	GARDEN ISLAND 4356 SCORE= 14.0	CLARK ISLAND 4386 SCORE= 15.4
LA POINTE ISLAND 4363 SCORE= 11.5	TROUT ISLAND (PART O 4321 SCORE= 20.0	BIG LA SALLE ISLAND 4489 SCORE= 12.0	STONY ISLAND, HEISTE 4455 SCORE= 14.0	ALBANY ISLAND 4394 SCORE= 15.4
JAMES ISLAND 4359 SCORE= 11.5	MEADE ISLAND 4385 SCORE= 20.0	MARQUETTE IS. (PART 4501 SCORE= 12.0	CROOKED ISLAND 4302 SCORE= 14.0	STRONGS ISLAND (PART 4484 SCORE= 15.4
ROGG ISLAND 4365 SCORE= 11.5	SNAKE ISLAND 4415 SCORE= 19.0	STRICKLANDS POINT 4334 SCORE= 11.0	PIPE ISLAND 4373 SCORE= 13.7	TRAVERSE ISLAND 4447 SCORE= 15.1
STRICKLANDS POINT 4334 SCORE= 11.5	01 NO NAME 4626 SCORE= 19.0	ODIEN IS. 4548 SCORE= 10.0	DUCK ISLAND 4392 SCORE= 13.7	SOUTH MINESHAS ISLAN 4452 SCORE= 15.1
BUTTERFIELD ISLAND 4342 SCORE= 11.5	NORTH MINESHAS ISLAN 4453 SCORE= 19.0	TRAVERSE ISLAND 4447 SCORE= 10.0	SALTONSTALL ISLAND 4336 SCORE= 13.7	STRAWBERRY ISLAND 4610 SCORE= 15.1
PECK ISLAND 4361 SCORE= 11.5	GULL ISLAND 4609 SCORE= 19.0	INDIAN IS. 4547 SCORE= 10.0	GRAVEL ISLAND 4352 SCORE= 13.7	WHITEFISH POINT ISLA 4483 SCORE= 15.1
BOULANGER ISLAND 4367 SCORE= 11.5	LITTLE LIME ISLAND 4348 SCORE= 19.0	STONY ISLAND, HEISTE 4455 SCORE= 10.0	TRAVERSE ISLAND 4447 SCORE= 13.7	GOVERNMENT ISLAND (P 4496 SCORE= 15.1
ASHMAN ISLAND 4362 SCORE= 11.5	ST. VITALS 4417 SCORE= 19.0	KATECHAY ISLAND, MAI 4454 SCORE= 10.0	SOUTH MINESHAS ISLAN 4452 SCORE= 13.7	MIDDLE ISLAND 4300 SCORE= 15.1

ISLAND MANAGEMENT RANKING TABLE

RANK ACCORDING TO DEVELOPMENT SCORE	RANK ACCORDING TO RECREATION SCORE	RANK ACCORDING TO RESOURCE SCORE	RANK REFLECTING EQUAL DEMAND (COL.I X 0.33 + COL.II X 0.33 + COL.III X 0.33)	RANK REFLECTING HIGH DEVELOPEMNT (COL.I X .25 + COL. II X .50 + COL.III X .25 +
CEDAR ISLAND 4332 SCORE= 11.5	LOVE ISLAND 4351 SCORE= 19.0	MANITOU ISLAND 4474 SCORE= 10.0	ANDREWS ISLAND 4345 SCORE= 13.4	LITTLE ST. MARTIN IS 4500 SCORE= 15.1
RUTLAND ISLAND 4360 SCORE= 11.5	HART ISLAND 4350 SCORE= 19.0	BOIS BLANC 4494 SCORE= 10.0	GUARD IS. 4549 SCORE= 13.4	01 NO NAME 4611 SCORE= 15.1
CASS ISLAND 4346 SCORE= 11.5	ROUND ISLAND 4416 SCORE= 19.0	ROUND ISLAND 4635 SCORE= 10.0	SHELTER ISLAND 4384 SCORE= 13.4	GRASSE ISLE 4630 SCORE= 15.1
BALD ISLAND 4366 SCORE= 11.5	01 NO NAME 4393 SCORE= 19.0	HARRIS ISLAND 4338 SCORE= 9.0	ROUND ISLAND 4635 SCORE= 13.4	ISLAND NO. 2 4376 SCORE= 15.1
GRAPE ISLAND 4364 SCORE= 11.5	TRAVERSE ISLAND 4447 SCORE= 19.0	LONG ISLAND 4337 SCORE= 9.0	INDIAN IS. 4547 SCORE= 13.4	DUCK ISLAND 4392 SCORE= 14.9
INDIAN IS. 4547 SCORE= 11.5	INDIAN IS. 4547 SCORE= 19.0	LOVE ISLAND 4351 SCORE= 9.0	DICKINSON ISLAND 4607 SCORE= 13.4	MOON ISLAND 4390 SCORE= 14.9
DICKINSON ISLAND 4607 SCORE= 11.5	SOUTH MINESHAS ISLAN 4452 SCORE= 19.0	SWEETS POINT ISLAND 4347 SCORE= 9.0	HARSEN'S ISLAND 4608 SCORE= 13.4	INDIAN IS. 4547 SCORE= 14.9
HARSEN'S ISLAND 4608 SCORE= 11.5	01 NO NAME 4613 SCORE= 19.0	SOUTH MINESHAS ISLAN 4452 SCORE= 9.0	NORTH MINESHAS ISLAN 4453 SCORE= 13.0	PORTER ISLAND 4473 SCORE= 14.9
LITTLE GULL ISLAND 4410 SCORE= 11.5	01 NO NAME 4612 SCORE= 19.0	LITTLE CHARITY 4310 SCORE= 9.0	MIDDLE ISLAND 4300 SCORE= 13.0	ARNOLD ISLAND 4358 SCORE= 14.9
GULL ISLAND 4409 SCORE= 11.5	STONY ISLAND, HEISTE 4455 SCORE= 19.0	THUNDER BAY ISLAND 4305 SCORE= 9.0	LOVE ISLAND 4351 SCORE= 13.0	BELLEVUE ISLAND 4357 SCORE= 14.9
LITTLE CHARITY 4310 SCORE= 11.5	KATECHAY ISLAND, MAI 4454 SCORE= 19.0	CHERRY ISLAND 4648 SCORE= 9.0	STRICKLANDS POINT 4334 SCORE= 13.0	GARDEN ISLAND 4356 SCORE= 14.9
UNNAMED (BOOTJACK IS 4355 SCORE= 11.5	ROCKY ISLAND 4414 SCORE= 19.0	01 NO NAME 4647 SCORE= 9.0	LITTLE CHARITY 4310 SCORE= 13.0	NORTH MINESHAS ISLAN 4453 SCORE= 14.6
LONG ISLAND 4353 SCORE= 11.5	LITTLE GULL ISLAND 4410 SCORE= 19.0	CLAW ISLAND 4339 SCORE= 8.0	ALBANY ISLAND 4394 SCORE= 12.7	SALTONSTALL ISLAND 4336 SCORE= 14.6
01 NO NAME 4612 SCORE= 10.5	GULL ISLAND 4409 SCORE= 19.0	NORTH MINESHAS ISLAN 4453 SCORE= 8.0	STRAWBERRY ISLAND 4610 SCORE= 12.7	GRAVEL ISLAND 4352 SCORE= 14.6

ISLAND MANAGEMENT RANKING TABLE

RANK ACCORDING TO DEVELOPMENT SCORE	RANK ACCORDING TO RECREATION SCORE	RANK ACCORDING TO RESOURCE SCORE	RANK REFLECTING EQUAL DEMAND (COL.I X 0.33 + COL.II X 0.33 + COL.III X 0.33)	RANK REFLECTING HIGH DEVELOPEMNT (COL.I X .25 + COL. II X .50 + COL.III X .25 +
SAND ISLAND 4379 SCORE= 10.5	LITTLE PRESQUE ISLE 4517 SCORE= 19.0	HARSEN'S ISLAND 4608 SCORE= 8.0	SILVER ISLAND 4387 SCORE= 12.4	LOVE ISLAND 4351 SCORE= 14.6
SHELTER ISLAND 4384 SCORE= 10.5	LITTLE CHARITY 4310 SCORE= 19.0	ANDREWS ISLAND 4345 SCORE= 7.0	GULL IS. 4520 SCORE= 12.4	GUARD IS. 4549 SCORE= 14.6
GIBIALTOR ISLAND 4629 SCORE= 10.5	WILLIAMS ISLAND 4292 SCORE= 19.0	STRAWBERRY ISLAND 4610 SCORE= 7.0	STONY ISLAND 4639 SCORE= 12.4	SAND ISLAND 4379 SCORE= 14.6
STONY ISLAND 4639 SCORE= 10.5	PARTRIDGE IS. 4516 SCORE= 19.0	DICKINSON ISLAND 4607 SCORE= 7.0	GRASSE ISLE 4630 SCORE= 12.4	LITTLE CHARITY 4310 SCORE= 14.6
HICKORY ISLAND 4636 SCORE= 10.5	AU TRAIN IS 4283 SCORE= 19.0	ISLAND NO. 1 4374 SCORE= 7.0	CLARK ISLAND 4386 SCORE= 12.0	HICKORY ISLAND 4636 SCORE= 14.6
01 NO NAME 4611 SCORE= 10.5	WOOD ISLAND 4291 SCORE= 19.0	ISLE ROYALE NATIONAL 4476 SCORE= 6.0	PORTER ISLAND 4473 SCORE= 12.0	ELIZABETH PARK 4640 SCORE= 14.6
ELIZABETH PARK 4640 SCORE= 10.5	SUGAR ISLAND 4304 SCORE= 19.0	CROOKED ISLAND 4302 SCORE= 5.0	SUGAR ISLAND 4304 SCORE= 12.0	01 NO NAME 4370 SCORE= 14.4
ZUG ISLAND 4644 SCORE= 10.5	LITTLE SUMMER ISLAND 4413 SCORE= 19.0	MIDDLE ISLAND 4300 SCORE= 5.0	STURGEON BAR ISLAND 4646 SCORE= 12.0	01 NO NAME 4372 SCORE= 14.4
HENNEPIN POINT 4642 SCORE= 10.5	GARDEN IS. (PART OF 4325 SCORE= 19.0	SUGAR ISLAND 4304 SCORE= 4.0	01 NO NAME 4641 SCORE= 12.0	01 NO NAME 4312 SCORE= 14.4
ISLAND NO. 1 4374 SCORE= 10.5	BOIS BLANC 4494 SCORE= 19.0	GULL ISLAND 4609 SCORE= 3.0	01 NO NAME 4611 SCORE= 12.0	SAND ISLAND 4382 SCORE= 14.4
ISLE ROYALE NATIONAL 4476 SCORE= 9.8	NEEBISH ISLAND 4381 SCORE= 19.0	01 NO NAME 4370 SCORE= 2.0	CLAW ISLAND 4339 SCORE= 12.0	STANDERSON ISLAND 4369 SCORE= 14.4
01 NO NAME 4398 SCORE= 9.5	DUCK ISLAND 4392 SCORE= 18.0	01 NO NAME 4372 SCORE= 2.0	MOON ISLAND 4390 SCORE= 11.7	01 NO NAME 4371 SCORE= 14.4
01 NO NAME 4370 SCORE= 9.5	BUTTERFIELD ISLAND 4342 SCORE= 18.0	01 NO NAME 4312 SCORE= 2.0	HARRIS ISLAND 4338 SCORE= 11.7	BIRD ISLAND 4396 SCORE= 14.4
DUCK ISLAND 4392 SCORE= 9.5	GUARD IS. 4549 SCORE= 18.0	SAND ISLAND 4382 SCORE= 2.0	LONG ISLAND 4337 SCORE= 11.7	GULL ISLAND 4303 SCORE= 14.4

ISLAND MANAGEMENT RANKING TABLE

RANK ACCORDING TO DEVELOPMENT SCORE	RANK ACCORDING TO RECREATION SCORE	RANK ACCORDING TO RESOURCE SCORE	RANK REFLECTING EQUAL DEMAND (COL.I X 0.33 + COL.II X 0.33 + COL.III X 0.33)	RANK REFLECTING HIGH DEVELOPEMNT (COL.I X .25 + COL. II X .50 + COL.III X .25 +
01 NO NAME	MAPLE ISLAND	STANDERSON ISLAND	SAND ISLAND	HAT ISLAND
4372 SCORE= 9.5	4341 SCORE= 18.0	4369 SCORE= 2.0	4379 SCORE= 11.7	4328 SCORE= 14.4
01 NO NAME	RAINS ISLAND	MOON ISLAND	HICKORY ISLAND	MIDDLE IS.
4312 SCORE= 9.5	4380 SCORE= 18.0	4390 SCORE= 2.0	4636 SCORE= 11.7	4518 SCORE= 14.4
SAND ISLAND	ROVER ISLAND (PART O	01 NO NAME	ELIZABETH PARK	ROUND ISLAND
4382 SCORE= 9.5	4482 SCORE= 18.0	4371 SCORE= 2.0	4640 SCORE= 11.7	4301 SCORE= 14.4
STANDERSON ISLAND	BIRCH ISLAND (PART O	01 NO NAME	01 NO NAME	FISHERMAN ISLAND
4369 SCORE= 9.5	4492 SCORE= 18.0	4613 SCORE= 2.0	4370 SCORE= 11.4	4329 SCORE= 14.4
MOON ISLAND	BEAVERTAIL POINT	01 NO NAME	01 NO NAME	01 NO NAME
4390 SCORE= 9.5	4503 SCORE= 18.0	4612 SCORE= 2.0	4372 SCORE= 11.4	4430 SCORE= 14.4
01 NO NAME	SQUAW ISLAND (PART O	SAND ISLAND	01 NO NAME	SULPHUR
4371 SCORE= 9.5	4324 SCORE= 18.0	4379 SCORE= 2.0	4312 SCORE= 11.4	4306 SCORE= 14.4
01 NO NAME	LONG ISLAND (PART OF	BIRD ISLAND	SAND ISLAND	SHELTER ISLAND
4614 SCORE= 9.5	4491 SCORE= 18.0	4396 SCORE= 2.0	4382 SCORE= 11.4	4384 SCORE= 14.4
01 NO NAME	STRONGS ISLAND (PART	SILVER ISLAND	STANDERSON ISLAND	GOOSE ISLAND (PART O
4613 SCORE= 9.5	4484 SCORE= 18.0	4387 SCORE= 2.0	4369 SCORE= 11.4	4493 SCORE= 14.4
STRAWBERRY ISLAND	WISKEY ISLAND (PART	CLARK ISLAND	01 NO NAME	CALF ISLAND
4610 SCORE= 9.5	4323 SCORE= 18.0	4386 SCORE= 2.0	4371 SCORE= 11.4	4638 SCORE= 14.4
BIRD ISLAND	BOOT ISLAND (PART OF	GULL ISLAND	BIRD ISLAND	ROUND ISLAND
4396 SCORE= 9.5	4498 SCORE= 18.0	4303 SCORE= 2.0	4396 SCORE= 11.4	4395 SCORE= 14.4
SILVER ISLAND	LITTLE LA SALLE (PAR	HAT ISLAND	GULL ISLAND	EDMOND ISLAND
4387 SCORE= 9.5	4490 SCORE= 19.0	4328 SCORE= 2.0	4303 SCORE= 11.4	4650 SCORE= 14.4
CLARK ISLAND	BIG ST. MARTIN IS.	MIDDLE IS.	HAT ISLAND	HOPSE ISLAND
4386 SCORE= 9.5	4499 SCORE= 18.0	4518 SCORE= 2.0	4328 SCORE= 11.4	4632 SCORE= 14.4
GULL ISLAND	MACKINAC ISLAND	ROUND ISLAND	MIDDLE IS.	ELBA ISLAND
4303 SCORE= 9.5	4495 SCORE= 18.0	4301 SCORE= 2.0	4518 SCORE= 11.4	4633 SCORE= 14.4
HAT ISLAND	MARQUETTE IS. (PART	ALBANY ISLAND	ROUND ISLAND	SWAN ISLAND
4328 SCORE= 9.5	4501 SCORE= 18.0	4394 SCORE= 2.0	4301 SCORE= 11.4	4637 SCORE= 14.4

ISLAND MANAGEMENT RANKING TABLE

RANK ACCORDING TO DEVELOPMENT SCORE	RANK ACCORDING TO RECREATION SCORE	RANK ACCORDING TO RESOURCE SCORE	RANK REFLECTING EQUAL DEMAND (COL.I X 0.33 + COL.II X 0.33 + COL.III X 0.33)	RANK REFLECTING HIGH DEVELOPEMNT (COL.I X .25 + COL. II X .50 + COL.III X .25 +
MIDDLE IS. 4518 SCORE= 9.5	01 NO NAME 4377 SCORE= 18.0	FISHERNAN ISLAND 4329 SCORE= 2.0	FISHERMAN ISLAND 4329 SCORE= 11.4	ROUND ISLAND 4635 SCORE= 14.4
ROUND ISLAND 4301 SCORE= 9.5	CLAW ISLAND 4339 SCORE= 17.0	01 NO NAME 4430 SCORE= 2.0	01 NO NAME 4430 SCORE= 11.4	HALL ISLAND 4649 SCORE= 14.4
FISHERMAN ISLAND 4329 SCORE= 9.5	SALTONSTALL ISLAND 4336 SCORE= 17.0	SULPHUR 4306 SCORE= 2.0	SULPHUR 4306 SCORE= 11.4	GIBIALTOR ISLAND 4629 SCORE= 14.4
01 NO NAME 4430 SCORE= 9.5	GRAVEL ISLAND 4352 SCORE= 17.0	GOOSE ISLAND (PART O 4493 SCORE= 2.0	GOOSE ISLAND (PART O 4493 SCORE= 11.4	ZUG ISLAND 4644 SCORE= 14.4
SULPHUR 4306 SCORE= 9.5	STRICKLANDS POINT 4334 SCORE= 17.0	CALF ISLAND 4638 SCORE= 2.0	CALF ISLAND 4638 SCORE= 11.4	HENNEPIN POINT 4642 SCORE= 14.4
GOOSE ISLAND (PART O 4493 SCORE= 9.5	GULL IS. 4520 SCORE= 17.0	ROUND ISLAND 4395 SCORE= 2.0	ROUND ISLAND 4395 SCORE= 11.4	01 NO NAME 4389 SCORE= 14.4
CALF ISLAND 4638 SCORE= 9.5	ARNOLD ISLAND 4358 SCORE= 17.0	EDMOND ISLAND 4650 SCORE= 2.0	EDMOND ISLAND 4650 SCORE= 11.4	ISLAND NO. 3 4375 SCORE= 14.4
ROUND ISLAND 4395 SCORE= 9.5	BELLEVUE ISLAND 4357 SCORE= 17.0	HORSE ISLAND 4632 SCORE= 2.0	HORSE ISLAND 4632 SCORE= 11.4	01 NO NAME 4398 SCORE= 14.1
EDMOND ISLAND 4650 SCORE= 9.5	WHITEFISH POINT ISLA 4483 SCORE= 17.0	ELBA ISLAND 4633 SCORE= 2.0	ELBA ISLAND 4633 SCORE= 11.4	PIPE ISLAND 4373 SCORE= 14.1
HORSE ISLAND 4632 SCORE= 9.5	GARDEN ISLAND 4356 SCORE= 17.0	SWAN ISLAND 4637 SCORE= 2.0	SWAN ISLAND 4637 SCORE= 11.4	STRICKLANDS POINT 4334 SCORE= 14.1
ELBA ISLAND 4633 SCORE= 9.5	SHELTER ISLAND 4384 SCORE= 17.0	HALL ISLAND 4649 SCORE= 2.0	HALL ISLAND 4649 SCORE= 11.4	01 NO NAME 4614 SCORE= 14.1
SWAN ISLAND 4637 SCORE= 9.5	GOVERNMENT ISLAND (P 4496 SCORE= 17.0	STONY ISLAND 4639 SCORE= 2.0	GIBIALTOR ISLAND 4629 SCORE= 11.4	01 NO NAME 4531 SCORE= 14.1
HALL ISLAND 4649 SCORE= 9.5	GULL ISLAND (PART OF 4320 SCORE= 17.0	HICKORY ISLAND 4636 SCORE= 2.0	ZUG ISLAND 4644 SCORE= 11.4	SUGAR ISLAND 4304 SCORE= 13.9
01 NO NAME 4531 SCORE= 9.5	LITTLE ST. MARTIN IS 4500 SCORE= 17.0	01 NO NAME 4611 SCORE= 2.0	HENNEPIN POINT 4642 SCORE= 11.4	GULL IS. 4520 SCORE= 13.6

ISLAND MANAGEMENT RANKING TABLE

RANK ACCORDING TO DEVELOPMENT SCORE	RANK ACCORDING TO RECREATION SCORE	RANK ACCORDING TO RESOURCE SCORE	RANK REFLECTING EQUAL DEMAND (COL.I X 0.33 + COL.II X 0.33 + COL.III X 0.33)	RANK REFLECTING HIGH DEVELOPENNT (COL.I X .25 + COL. II X .50 + COL.III X .25 +
01 NO NAME 4389 SCORE= 9.5	SUGAR ISLAND 4634 SCORE= 17.0	ELIZABETH PARK 4640 SCORE= 2.0	01 NO NAME 4389 SCORE= 11.4	CLAW ISLAND 4339 SCORE= 13.4
ISLAND NO. 3 4375 SCORE= 9.5	ROUND ISLAND 4635 SCORE= 17.0	GRASSE ISLE 4630 SCORE= 2.0	ISLAND NO. 3 4375 SCORE= 11.4	STURGEON BAR ISLAND 4646 SCORE= 12.9
GRASSY ISLANDS 4643 SCORE= 8.0	ISLAND NO. 2 4376 SCORE= 17.0	01 NO NAME 4389 SCORE= 2.0	ODIEM IS. 4548 SCORE= 11.1	01 NO NAME 4641 SCORE= 12.9
ODIEM IS. 4548 SCORE= 8.5	HARRIS ISLAND 4338 SCORE= 15.0	ISLAND NO. 3 4375 SCORE= 2.0	01 NO NAME 4398 SCORE= 11.1	HARRIS ISLAND 4338 SCORE= 12.6
GUARD IS. 4549 SCORE= 8.5	PIPE ISLAND 4373 SCORE= 15.0	01 NO NAME 4398 SCORE= 1.0	01 NO NAME 4614 SCORE= 11.1	LONG ISLAND 4337 SCORE= 12.6
01 NO NAME 4641 SCORE= 8.5	LONG ISLAND 4337 SCORE= 15.0	01 NO NAME 4614 SCORE= 1.0	01 NO NAME 4531 SCORE= 11.1	01 NO NAME 4612 SCORE= 12.6
GULL IS. 4520 SCORE= 7.5	ODIEM IS. 4548 SCORE= 15.0	PORTER ISLAND 4473 SCORE= 1.0	CHERRY ISLAND 4648 SCORE= 10.4	01 NO NAME 4613 SCORE= 12.4
STURGEON BAR ISLAND 4646 SCORE= 7.5	STURGEON BAR ISLAND 4646 SCORE= 15.0	GIBIALTOR ISLAND 4629 SCORE= 1.0	01 NO NAME 4647 SCORE= 10.4	ODIEM IS. 4548 SCORE= 12.1
CHERRY ISLAND 4648 SCORE= 7.5	01 NO NAME 4641 SCORE= 15.0	ZUG ISLAND 4644 SCORE= 1.0	01 NO NAME 4612 SCORE= 10.4	GULL ISLAND 4609 SCORE= 11.9
01 NO NAME 4647 SCORE= 7.5	CHERRY ISLAND 4648 SCORE= 15.0	HENNEPIN POINT 4642 SCORE= 1.0	01 NO NAME 4613 SCORE= 10.1	CHERRY ISLAND 4648 SCORE= 11.6
GULL ISLAND 4609 SCORE= 6.5	01 NO NAME 4647 SCORE= 15.0	01 NO NAME 4531 SCORE= 1.0	GULL ISLAND 4609 SCORE= 9.4	01 NO NAME 4647 SCORE= 11.6
04550 SCORE= .0	04550 SCORE= .0	04550 SCORE= .0	04550 SCORE= .0	04550 SCORE= .0

III. INFORMATION GAPS

While it was possible to assemble some of the information necessary for development of the island resource data base, much data was not readily available. The primary cause of this problem was that information, such as soil types, depth to groundwater and bedrock, etc., has not been compiled for islands. This situation was not anticipated at the initiation of data acquisition as such information is readily available for nearly all of Michigan's mainland coastal areas. It has, in fact, been available for so long that it was difficult to identify an alternate source once such conventional avenues as the Soil Conservaton Service had proven unsuccessful.

The necessity for inclusion of much of this data was its relevance to understanding the impacts which could result from physical development of islands. Current pressure for leisure home development and the demand for other intensive uses on islands makes these crucial elements of the data base.

There are other missing data items which, while perhaps unrelated to development potential, are nonetheless important parts of the data base. In the following paragraphs, each of the major information gaps are documented - what is missing, why it is important, alternate source of data, and the procedure for obtaining the data, when applicable. At the end of this section is a matrix which shows which data items are already obtained. The source for those which need to be obtained and the expected level of difficulty of obtaining them.

A. Island Location - Township, Range and Section Numbers

In order to be compatible with other MDNR maintained data bases, it was determined that the location of each island would be listed by township, range, and section (TRS) number. Unfortunately, unlike the mainland of Michigan, doing this proved to be more than merely checking an atlas to identify the correct TRS number for a particular island. Since islands are not part of Michigan's contiguous land mass, they were never assigned TRS numbers at the same time as the mainland. In fact, the Heritage Conservation and Recreation Service Island Inventory locates Michigan's islands according to latitude and longitude. This was not deemed an acceptable procedure for the project at hand since it was not consistent with other MDNR information files and, therefore, would limit the usefulness of the data base.

Converting latitude and longitude to TRS numbers was not feasible. There is no specific formula which can be applied to transform Township and Range coordinates to latitude and longitude, or vice-versa. Because the 360° side of the earth's surface measures fewer and fewer miles with increasing distance north or south from the equator, the number of linear miles per degree of longitude (E-W) decreases. Since the Township and Range system is based on a rectangular grid of square mile units (with some exceptions), all the north-south running lines are broken from time to time and offset to the east or west to allow the system of square-mile sections to be maintained. This is to avoid the convergence that would occur if the N-S lines were continued without a break, which would eventually render a regular division of the intervening space into square miles impossible. East and west township lines may also be offset north or south as the system intersects county boundaries. As these offsets are not systematic, there is no material or statewide conversion possible from one system to the other; although there is a regular transformation of miles north and east of a zero point into degrees of latitude and longitude, the same is not true for the Township and Range system.

The only available means of supplying TRS numbers for islands involves extending the TRS Grid System from the mainland out over the intervening water surface to the island. This extension can only be done accurately in an east or west direction, any extension to the north or south involves inaccuracies described above. While this process will be time consuming, it will produce the needed information. It should also be noted that TRS numbers have been generated for a limited number of islands already by local officials and these could be obtained from county plat maps thereby reducing the generation task.

B. Soil Suitability for On-Site Wastewater Treatment

Development on an island should be predicated on the suitability of soils for on-site treatment of wastewater (i.e., septic tank and drainfield). If development is allowed in spite of the lack of suitability, or without prior knowledge, then groundwater quality degradation is inevitable. Suitability of the soils for on-site treatment can be determined by applying Soil Conservation

Service standards. These standards classify soils as to their limitations upon successful operation of on-site treatment systems such as septic tanks and/or drainfields.

Unfortunately, the necessary soils maps are not available for all of Michigan. Contact with the Soil Conservation Service revealed that a number of counties do not have a published soil survey and many of these are coastal counties. Those coastal counties with soil surveys already published includes interpolated data on the islands within that political jurisdiction. (See Appendix C for status of soil surveys)

In those counties without published soil surveys, it is possible to obtain information on area soils from the County Environmental Health Officer. This avenue was suggested by Robert F. Gurchiek, Chief, Land Subdivision and Planning Section, Michigan Department of Public Health. As individual requests for on-site systems fall under the rules and regulations of local (county) sanitary codes, the local health officer or sanitarian will prove to be the best alternate source of soil conditions. (See Appendix D for listing of local environmental health offices.)

C. Presence of an Identified, Exploitable Mineral Resource

Knowledge of the presence of an identified, exploitable mineral resource provides a dependable means of anticipating the demand for mineral exploitation of an island. The ongoing extraction of limestone on Drummand Island is a good example of the type of exploitation which can occur. It is anticipated that the demand for industrial sands could cause the exploitation of the sand fields and dunes which are located on some of Michigan's Great Lakes islands.

At present though, the knowledge about location of mineral resources on islands is very limited. While some research is conducted by the MDNR Geological Survey Division, only rarely have the efforts been directed at, or include, islands. (Report of Investigation #18, Drill Core Investigation of the Fiborn Limestone Member in Schoolcraft, Mackinac and Chippewa Counties, Michigan, 1978, Geological Survey Division), explores the potential for a commercially exploitable limestone product in an area which includes some of the islands in the Garden Peninsula area.

In spite of the limited amount of research conducted, the Geological Survey Division is the best source of information on mineral resources. While there is not at present a standard reference which can be referred to, the contact which Geological Survey Divison maintains with the mining industry will allow them to provide information on specific islands in many instances. It should also be noted that Geological Survey Division, through the Sand Dune Protection and Management Act, has been given the responsibility of identifying Michigan's sand dune resources and this will represent a valuable source of information once it has been completed for all of Michigan's Great Lakes shoreline.

D. Presence of an Identified, Exploitable Timber Resource

Knowledge of the presence of an identified exploitable timber resource provides a reliable means of anticipating a demand for timber harvesting of an island while modern timber management practices can limit the adverse impact of harvesting upon an ecological system. There is still good cause for concern when this takes place upon an island. An island may provide essential habitat that would be lost, at least temporarily, if the timber were harvested. Disruption of an isolated habitat opportunity could have a serious impact on wildlife.

Unfortunately, inventorying existing timber resources on private lands is not the responsibility of any public agency. The Forest Management Division of the MDNR does maintain records on the value of timber resources on State owned lands. This information could be utilized whenever an island was owned by the State; only if that particular property had been evaluated.

It should be noted that in conversations with Forest Management personnel, it was revealed that exploitation of timber resources on islands is severely constrained by the costs associated with working on an island. In most instances, the costs are too great to make the operation commercially feasible unless the timber is processed (i.e., sawmill required) on the island itself as happens on Beaver Island. Even then, transportation can be a severe problem in terms of access to the island for large ships.

E. Minimum Depth to Water Table

The seasonal high depth to groundwater is an extremely important factor when considering development of land if the groundwater periodically is in close proximity to the surface. Physical development, especially when it includes use of on-site wastewater treatment, can cause degradation of groundwater quality.

While this information is readily obtained for the mainland, there is no easily referenced source for Michigan's Great Lakes Islands. Groundwater maps prepared for political jurisdictions in the state, do not extend to the adjacent islands. This information can be eventually obtained from the MDNR Geological Survey Division for an individual case specific request. Geological Survey has access to well (water supply) data which would include depth to groundwater. Unfortunately, there may be instances when no wells have been constructed on an island, or the island is too large to predict overall groundwater depths from the well log data available. Examination of the islands elevation above lake level, conversations with local health officials, or perhaps field checks would then be the only recourse.

F. Average Depth to Bedrock

The depth to bedrock, as an indicator of the extent of overburden present, can be of extreme importance in anticipating the potential impact of development. In those instances where the layer of overburden or topsoil is thin (less than 8 feet for example) the impact of development through compaction of the soil, etc., can be extensive. Also, on-site treatment of wastewater, and construction in general, can be difficult when bedrock is close to the surface.

Information on the depth to bedrock is well documented for some areas in Michigan especially where quarrying or other extractive operations are being pursued. This does not, unfortunately, include all but a handfull of Michigan's Great Lakes islands. As in the case with depth to groundwater, this information may eventually be obtained through examination of available well log data which can be done on a case specific basis by Geological Survey Division. The same limitations on use of the well log data mentioned in regard to groundwater investigations also apply here.

G. Missing Data in the Heritage Conservation and Recreation Service (HCRS) Dataset and Other Information Gaps.

The dataset prepared by the HCRS from their island inventory is missing data for some of the inventory questions for particular islands. When the problem of missing data is encountered for an island being reviewed, the following procedure is suggested. Contact should be made with the appropriate division/agency within the state or federal government depending upon the nature of the missing data for their possible assistance. If this avenue is not helpful, contact should be made with local officials from the political jurisdiction within which the island is located. As a last resort, field checks can be performed if the missing data is deemed to be of crucial importance.

DATA SOURCES FOR ISLAND CLASSIFICATION SYSTEM/DATA BASE

DATA ENTRY POINTS \ DATA SOURCE	HCRS ISLAND INVENTORY	MDNR LRPD	LOCAL HEALTH OFFICERS	MDNR GEOLOGICAL SURVEY	MDNR FOREST MANGEMENT
1. Island Name	✓				
2. I.D. Code	✓				
3. Body of Water		✓			
4. I.D. Code		✓			
5. County Name	✓				
6. I.D. Code		✓			
7. Location (T.R.S. #)		!			
8. Ownership	✓				
9. Island Size	✓				
10. Access	✓				
11. Distance from Mainland	✓				
12. Urban Proximity		*			
13. Soil Suitability for On-Site Wastewater Treatment			!		
14. Potable Water	✓				
15. Acreage Available for Recreation	✓				
16. % Developed	✓				
17. Programmed Future Recreation Development	✓				
18. Acreage Suitable for Recreation Use	✓				
19. # of Public Parks	✓				
20. Potential Recreational Activities	✓				
21. Seasons of Potential Recreational Use	✓				
22. Elevation	✓				
23. Topography Types	✓				
24. Shoreline Types	✓				
25. Vegetative Cover Types	✓				
26. Quality Characteristics	✓				
27. Mineral Resources				!	
28. Timber Resources					!
29. Depth of Water Table				!	
30. Depth to Bedrock				!	

KEY

✓ - Existing
* - Readily Obtained
! - Difficult to Obtain

APPENDIX B

DATA ACQUISITION CONTACTS

DATA ACQUISITION CONTACTS

The following is a list of the governmental agencies, research institutes and libraries contacted for information in the Data Review and Analysis Effort. For the convenience of the reader the listing is organized by level of government (federal, state, regional) with the research institutes and libraries listed separately.

FEDERAL AGENCIES:

1. U.S. Department of Interior, National Park Service

   Field Office
   Apostle Islands National Lakeshore
   Bayfield, WI
   (715) 779-3397

   Field Office
   Sleeping Bear Sand Dunes National Lakeshore (Manitou Islands)
   Frankfort, MI
   (616) 352-9611

   Heritage Conservation & Recreation Service
   Lake Central Region
   Ann Arbor, MI
   (313) 668-2025

   Heritage Conservation & Recreation Service
   Pension Building
   440 G Street, N.W.
   Washington, D.C. 20243
   (202) 343-4793

   U.S. Army Corps of Engineers
   Waterways Experiment Station
   Environmental Laboratory
   P.O. Box 631
   Vicksburg, MS 39180
   (601) 634-3702

2. Canada

   Parks Canada
   Indian & Northern Affairs
   440 Laurier Avenue, West
   Ottawa, Canada K1A OH4
   (613) 997-0088

STATE AGENCIES:

Florida

Coastal Coordinating Council
309 Magnolia Office Plaza
Tallahassee, FL 32301
(904) 488-8614

Louisiana

State Planning Office
P.O. Box 44425
Baton Rouge, LA 70804
(504) 342-7591

Maine

State Planning Office
184 State Street
Augusta, ME 04330
(207) 289-3155

Maryland

Coastal Zone Management Program
Water Resources Administration
Department of Natural Resources
Tawes State Office Building
Annapolis, MD 21401
(301) 269-3382

Michigan

Department of Natural Resources
Stevens T. Maxon Building
P. O. Box 30028
Lansing, Michigan 48926

Forest Management Division
5th Floor - Mason Building
(517) 373-1275

Geological Survey Division
4th Floor - Mason Building
(517) 373-1256

Lands Division
5th Floor - Mason Building
(517) 373-1270

Michigan Land Trust Fund
7th Floor - Mason Building
(517) 373-1750

Parks Division
5th Floor - Mason Building
(517) 373-1270

Waterways Division
3rd Floor - Secondary Complex
(517) 322-1311

Wildlife Division
6th Floor Mason Building
(517) 373-1263

History Division
Department of State
3rd Floor - Mutual Building
208 N. Capital Avenue
Lansing, Michigan 48918
(517) 373-0510

Massachusetts

Executive Office of Environmental Affairs
18 Tremont Street
Boston, MA 02108
(617) 727-9530

New Hampshire

Division of State Planning
State House
Concord, New Hampshire
(603) 271-1110

North Carolina

Department of Natural & Economic Resources
116 West Jones Street
Raleigh, NC 37611
(919) 733-2293

Ohio

Department of Natural Resources
Coastal Planning
1930 Belcher Drive
Columbus, OH 43224
(614) 466-3066

South Carolina

Coastal Zone Management Council
P.O. Box 547
Beaufort, SC 29902
(803) 792-5808

Texas

State Land Commissioner
General Land Office
P.O. Box 12428
Capitol Station
Austin, TX 78711
(512) 475-1539

Virginia

Commerce & Resources Section
Division of State Planning & Community Affairs
1010 James Madison Building
109 Governor Street
Richmond, VA 23219
(804) 786-7652

Wisconsin

State Planning Office
B-130
One West Wilson Street
Madison, WI 53702
(608) 266-3382

REGIONAL AGENCIES

Great Lakes Information Center
(Great Lakes Basin Commission)
3475 Plymouth Road
Ann Arbor, MI 48106
(313) 668-2330

Central Upper Peninsula Planning and
Development Regional Commission
2415 14th Avenue, South
Escanaba, MI 49829
(906) 786-9234

Eastern Upper Peninsula Regional Planning
Land Development Commission
Lake Superior State College
Sault Ste. Marie, MI 49783
(906) 635-1581

Northeast Michigan Council of Governments
Old Hospital Building
131 Shipp Street
P.O. Box 457
Gaylord, MI 49735
(517) 732-3551

Northwest Michigan Regional Planning
and Development Commission
2334 Aero Park Court
Traverse City, MI 49684
(616) 946-5922

St. Lawrence-Eastern Ontario Commission
New York State Executive Department
317 Washington Street
Watertown, NY 13601
(315) 782-0100, X-263

Western Upper Peninsula Planning
and Development Regional Commission
P. O. Box 365
Houghton, MI 49931
(906) 482-7205

RESEARCH INSTITUTES

Bowling Green State University
Great Lakes Research Center
214 Graduate Center
Bowling Green, OH 43402
(419) 372-2474

University of Illinois
Water Resources Center
2535 Hydrosystems Laboratory
Urbana, IL 61801
(217) 333-0536

University of Michigan
Great Lakes Research Division
Institute of Science & Technology Building
Ann Arbor, MI 48109
(313) 764-2422

University of Michigan
Sea Grant Program
1101 N. University Building
Ann Arbor, MI 48109
(313) 763-1437

State University of New York - Buffalo
Great Lakes Laboratory
1300 Elmwood Avenue
Buffalo, NY 14222
(716) 878-5422

Purdue University
Great Lakes Coastal Research Laboratory
Department of Geosciences
West Lafayette, IN 47907
(317) 494-8171

LIBRARIES

Case Western Reserve University
Sears Library
10900 Euclid Avenue
Cleveland, OH 44106
(216) 368-4246

University of Michigan
Institute of Science & Technology Library
3112 IST Building
North Campus
Ann Arbor, MI 48161
(313) 764-5217

State University of New York - Stony Brook
Environmental Information Service
Library Reference Department
Stony Brook, NY 11790
(516) 246-5975

Pennsylvania State University
Institute for Research on Land and
Water Resources Library
Land & Water Research Building
University Park, PA 16802
(814) 863-0598

University of Wisconsin - Milwaukee
Center for Great Lakes Study Library
1900 East Kenwood Boulevard
Milwaukee, WI 53201
(414) 224-3000

University of Wisconsin - Superior
Center for Lake Superior Environmental Studies Library
Superior, WI 54880
(715) 392-8101, X-315

APPENDIX C

COMPARISON OF HCRS AND BLM ISLAND INVENTORY DATASETS

COMPARISON OF HCRS AND BLM ISLAND INVENTORY DATASETS

The Heritage Conservation and Recreation Service (HCRS) and Bureau of Land Management (BLM) both performed surveys/inventories of the islands in Michigan. The HCRS study was done in the late 1960's and predates the BLM project which was performed in 1971-1972. The similarities and differences in the data accumulated in the two efforts are as follows:

A. Ownership/Management

The BLM dataset contains a single entry for ownership and does not provide for split ownership or management. The HCRS dataset lists this item by acres controlled by management level (federal, state, other public, quasi-public and private).

B. Size

The BLM dataset has a single entry point for estimated acreage. The HCRS dataset lists acreage for single islands, island groups (where applicable) and then breaks down the island groups by number of islands which fall into a range of sizes (10 acres, 100 acres, 500 acres, 1000 acres, 999 acres).

C. Acreage Available for Recreation

While the BLM dataset does list current use (occupancy) it does not indicate the availability of all, or any portion, of the island for recreation use. The HCRS, dataset lists acreage available for recreation use by management level (federal, state, other public, quasi-public, and private).

D. Existing Recreation Facilities

The BLM dataset does not specifically list existing recreation facilities on the islands. The HCRS dataset notes the existence of recreation facilities by management level (federal, state, other).

E. Extent of Existing Development

The BLM dataset does not note the level of existing residential, commercial or industrial uses on the island. The HCRS dataset indicates the percentage of development (five ranges: 0, 1-25, 26-50, 51-75, 76-100).

F. Existing Plans for Recreation Development

The BLM dataset does not include information on plans for future recreation development for the islands. The HCRS dataset indicates the existence/non-existence of such plans and the level of management (federal, state, other public, quasi-public, private) responsible for the plan.

G. Specific Island Characteristics

The BLM dataset includes information on types of vegetative cover and wildlife species present. The HCRS provides only the opportunity to note that significant plant or animal communities are present, but does not list them by name. It should be noted that this particular item in the HCRS dataset also provides the opportunity to list many other "Quality Characteristics" of the island (scenic, historical, geological, archeological, cultural, natural and wilderness, and fish or wildlife habitat qualities) which the BLM dataset does not include.

H. Recreation Opportunities

The BLM dataset lists the types of recreation opportunities present on the island. The HCRS dataset lists potential recreation activities contained on the island.

I. Access

Both datasets indicate the type of access to the island which is currently available, though the HCRS list is more extensive.

J. Elevation

Both datasets list the elevation above MHW (mean high water datum).

K. Distance

Both datasets list the shortest distance of the island from the mainland.

L. Slope

The BLM dataset indicates the general slope of the island in a single figure. The HCRS dataset expresses slope by indicating the percentage of island acreage which falls into four categories (level, rolling, mountainous, other).

M. Cover

As noted previously, the BLM dataset lists the vegetative cover types present by name. The HCRS dataset expresses vegetative cover types by indicating the percentage of island acreage which falls into ten categories (grass or pasture, forest, shrub, swamp or marsh, cultivated, naturally barren, water, mangrove, developed land, other).

N. Rating of Vegetative Cover

The BLM dataset produces a rating of the value of the vegetative cover of the island. The HCRS dataset does not provide this information.

O. Seasons of Potential Recreation Use

Both datasets list the seasons of potential recreation use.

P. Shoreline Types

The BLM dataset notes the predominant shore use of the island along with the percentage developed. The HCRS dataset expresses shoreline type by indicating the percentage of the island acreage which falls into four categories (beach, bluff, swamp or marsh, other).

Q. Presence of Potable Water

The BLM dataset does not note the presence of potable water on the island. The HCRS dataset does include this information.

R. Acreage Suitable for Recreation

The BLM dataset does not indicate the acreage of the island suitable for recreation use. The HCRS dataset does include this information.

S. Location

The BLM dataset use TRS #'s when available as the means of indicating the location of the island. The HCRS dataset uses latitude and longitude as the means of indicating the location of the island.

SUMMARY

Review of the above comparison of the two datasets indicates that the HCRS data is the most comprehensive. It also appears to contain information which is of more value from a management perspective. Perhaps the biggest advantage of the HCRS dataset is the format in which the dataset is stored. The HCRS dataset is on computer tape and can easily be accessed for the purpose of sorting, constructing tables, etc. As the BLM data is stored on microfilm, the problem with accessibility limits its potential for effective use.

APPENDIX D

STATUS OF SOIL SURVEYS

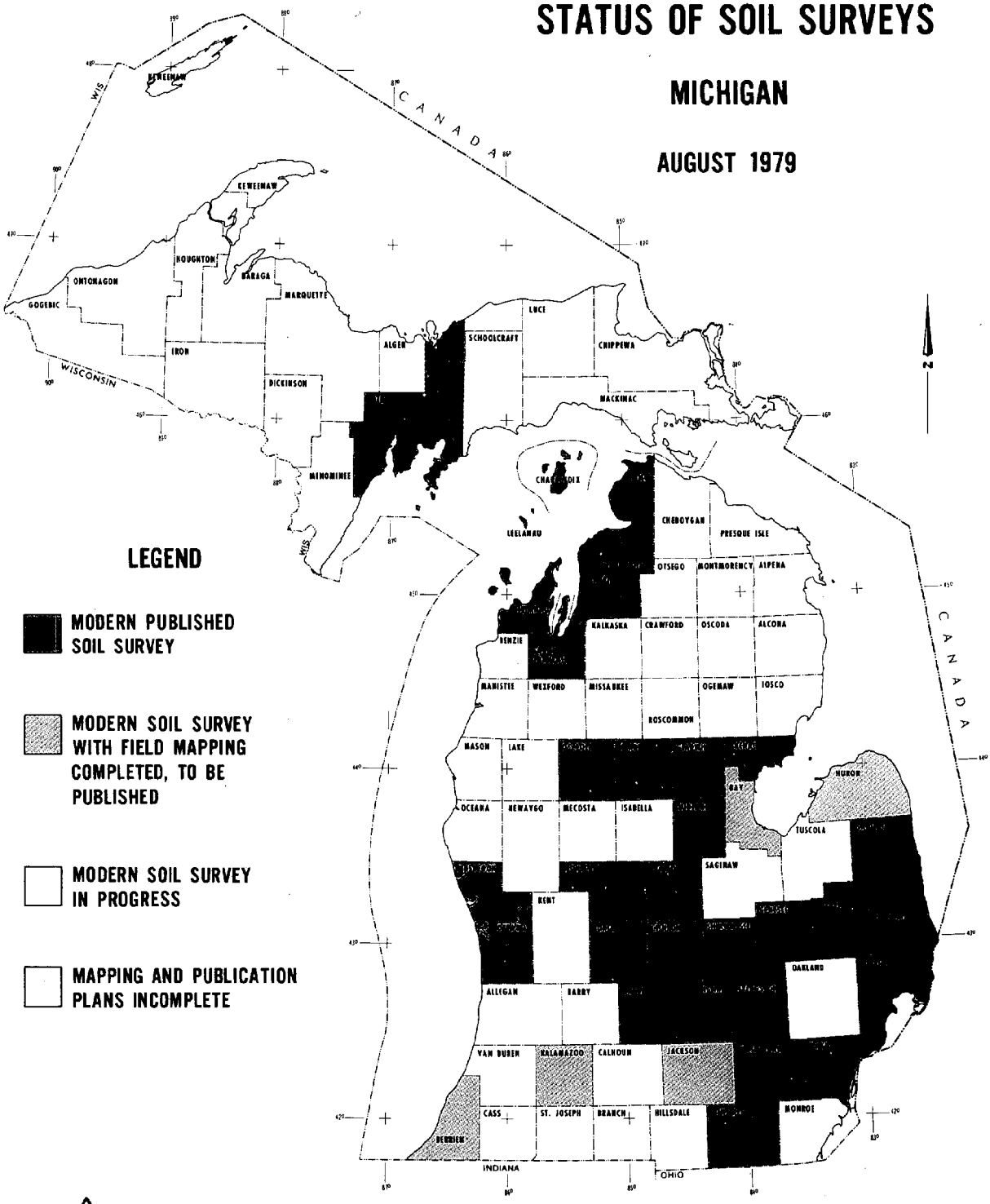
U. S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

STATUS OF SOIL SURVEYS

MICHIGAN

AUGUST 1979



LEGEND

- MODERN PUBLISHED SOIL SURVEY
- MODERN SOIL SURVEY WITH FIELD MAPPING COMPLETED, TO BE PUBLISHED
- MODERN SOIL SURVEY IN PROGRESS
- MAPPING AND PUBLICATION PLANS INCOMPLETE

SOURCE:
FAMILY OF MAPS DRWG. NO. 5,S-32,577 (7-74)
AND INFORMATION FROM SCS FIELD PERSONNEL
ALBERS EQUAL AREA PROJECTION

SCALE 0 10 20 30 40 50 60 70 80 90 MILES
0 20 40 60 80 100 120 140 KILOMETERS

REV. 8-2-79
5,P-36,339

USDA-SCS-LINCOLN, NEBR. 1979

Status of Soil Surveys

An Update
4/15/80

Modern Published Soil Survey	Add	Huron, Bay Kalamazoo Counties
Modern Soil Survey with field mapping completed - to be published	Add	Oakland and Monroe Counties
Modern Soil Survey in Progress	Add	Dickinson County

APPENDIX E

LOCAL ENVIRONMENTAL
HEALTH OFFICES

LOCAL HEALTH DEPARTMENT ENVIRONMENTAL HEALTH OFFICES LISTING PERSON IN RESPONSIBLE CHARGE

ALLEGAN COUNTY

William Hinz, R.S., Allegan County Service Bldg., 2233 33rd Street, Allegan 49010

BARRY-EATON DISTRICT

Robert Shaffer, R.S., 208 W. Court St., Hastings 49058 (BARRY COUNTY)
*EATON - 528 Beech St., Charlotte 48813

BAY COUNTY

Edward M. Golson, R.S., Washington Park Plaza, 301 Second Street, Bay City 48706

BERRIEN COUNTY

Don Oderkirk, R.S., 769 Pipestone, P.O. Box 706, Benton Harbor 49022

BRANCH-HILLSDALE-ST. JOSEPH DISTRICT

Noel Wiley, R.S., 441 E. Main, Box 66, Centreville 49032 (ST. JOSEPH COUNTY)
*BRANCH - 809 Marshall Rd., Coldwater 49036
HILLSDALE - 155 W. Fayette St., Hillsdale 49242

CALHOUN COUNTY

Fred Havens, R.S., 190 E. Michigan Avenue, Battle Creek 49017

CASS COUNTY

Dale Hippensteel, R.S., R# 2, Hospital Road, Cassopolis 49031

CENTRAL MICHIGAN DISTRICT

Marvin Baumann, R.S., 1222 North Drive, Mt. Pleasant 48858 (*ISABELLA COUNTY)
ARENAC - Courthouse, Box 478, Standish 48658
CLARE - Courthouse, Harrison 48625
GLADWIN - 555 West Cedar Avenue, Gladwin 48624
OSCEOLA - 115 N. Sears St., Reed City 49677
ROSCOMMON - Courthouse, Box 208, Roscommon 48653

CHIPPEWA COUNTY

James Shifflet, R.S., Comm. Bldg., Newberry 49868
Kurt Yacuone, R.S., 139 Arlington St., Sault Ste. Marie 49783

DELTA-MENOMINEE DISTRICT

David Bylund, R.S., 2920 College Avenue, Escanaba 49829 (*DELTA COUNTY)
MENOMINEE - 909 10th Ave., Menominee 49858

DICKINSON-IRON DISTRICT

Ronald Matonich, R.S., 800 Crystal Lake Blvd., Iron Mountain 49801 (DICKINSON COUNTY)
*IRON - Commercial Bank Building, 130 Third St., Stambaugh 49964

GENESEE COUNTY

Fred Germaine, R.S., 310 W. Oakley St., Flint 48503

GRAND TRAVERSE-LEELANAU-BENZIE DISTRICT

Milton Stanton, R.S., 10767 Traverse Hwy., P.O. Box 905, Traverse City 49684 (*GRAND TRAVERSE COUNTY)
BENZIE - Benzie County Governmental Building, P.O. Box 335, Beulah 49617

HURON COUNTY

William Jennings, R.S., Huron County Building, Bad Axe 48413

INGHAM COUNTY

John Ruskin, P.E., 403 W. Greenlawn Ave., P.O. Box 40061, Lansing 48901

IONIA COUNTY

Robert Shaffer, R.S., 208 W. Court St., Hastings 49058
Don MacLachlan, R.S., Perrone Building, 111 N. Kidd St., Ionia 48846

JACKSON COUNTY

Richard Hardy, R.S., 410 Erie St., Jackson 49202

KALAMAZOO COUNTY

James Akers, R.S., 418 W. Kalamazoo Ave., Kalamazoo 49007

KENT COUNTY

George Pio, R.S., 700 Fuller, N.E., Grand Rapids 49503

LAPEER COUNTY

Raphael Gaynier, R.S., 1575 Suncrest Drive, Lapeer 48446

LENAWEE COUNTY

Fred Keeslar, R.S., 1301 N. Main Street, Adrian 49221

LIVINGSTON COUNTY

Barry R. Burns, R.S., 210 S. Highlander Way, Howell 48843

LUCE-MACKINAC-ALGER-SCHOOLCRAFT DISTRICT

James Shifflet, R.S., Community Building, Newberry 49868 (*LUCE COUNTY)
ALGER - Medical Arts Building, Sand Point Road, Munising 49862
MACKINAC - Med. Care Facility, St. Ignace 49781
SCHOOLCRAFT - Schoolcraft County Courthouse, Manistique 49854

MACOMB COUNTY

Merlin Damon, R.S., 43525 Elizabeth Rd., Mt. Clemens 48043

MANISTEE-MASON DISTRICT

James Lerg, R.S., Courthouse, Manistee 49660 (*MANISTEE COUNTY)
Robert Dixon, R.S., 1110 S. Washington Ave., Ludington 49431 (MASON)

MARQUETTE COUNTY

Alan Budinger, R.S., 184 U.S. 41 Highway, Negaunee 49866

MECOSTA COUNTY

William Baldwin, R.S., 400 Elm Street, County Building, Big Rapids, 49307

MIDLAND COUNTY

Doug Diak, R.S., Post Office Building, 125 W. Main St., Midland 48640

MID-MICHIGAN DISTRICT

Lyle L. Livasy, R.S., Box 336, 617 N. State Rd., Stanton 48888 (*MONTCALM COUNTY)
CLINTON - 306 Elm Street, St. Johns 48879
GRATIOT - 204 S. Main, Ithaca 48847

MONROE COUNTY

Harry Grenawitzke, R.S., 650 Stewart Road, Monroe 48161

MUSKEGON COUNTY

Michael Vanden Heuvel, R.S., 1611 E. Oak Ave., Muskegon 49442

OAKLAND COUNTY

Edward O'Rourke, R.S., 1200 N. Telegraph Rd., Pontiac 48053

OTTAWA COUNTY

Leslie Toth, R.S., Ottawa County Bldg., 414 Washington Ave., Grand Haven 49417

SAGINAW COUNTY

Bennie Woodard, Jr., R.S., 1600 N. Michigan Avenue, Saginaw 48602

ST. CLAIR COUNTY

John O. Tironi, R.S., 108 McMorran Blvd., Port Huron 48060

SANILAC COUNTY

Grant Carman, R.S., 115 N. Elk Street, Sandusky 48471

SHIAWASSEE COUNTY

Charles Newell, R.S., 110 E. Mack St., Corunna 48817

TUSCOLA COUNTY

Edward Kimbrue, R.S., 2266 W. Caro Road, Caro 48723

VAN BUREN COUNTY

Frank Zaidel, R.S., P.O. Box 307, Hartford 49057

WASHTENAW COUNTY

Barry Johnson, P.E., P.O. Box 8645, Ann Arbor 48107

WAYNE COUNTY

Glenn Brown, P.E., Wayne County Complex, Westland 48185

WESTERN UPPER PENINSULA DISTRICT

Ben Ricchi, R.S., 1100 Quincy St., Hancock 49930 (*HOUGHTON COUNTY)
BARAGA - Baraga County Memorial Hospital, L'Anse 49946
GOGEBIC - 210 E. Mary St., Bessemer 49911
ONTONAGON - Ontonagon County Medical Care Facility, Ontonagon 49953

DISTRICT HEALTH DEPARTMENT #1

Bruce Reynolds, R.S., 6180 W. Sanborn Rd., P.O. Box T, Lake City 49651 (*MISSAUKEE COUNTY)
CRAWFORD - Courthouse, Grayling 49738
KALKASKA - 503 N. Birch Street, P.O. Box 677, Kalkaska 49646
WEXFORD - 401 Lake St., Cadillac 49601

DISTRICT HEALTH DEPARTMENT #2

James Hasty, R.S., 806 W. Houghton St., P.O. Box 38, West Branch 48661 (*OGEMAW COUNTY)
ALCONA - Courthouse, Harrisville 48740
IOSCO - 339 S. State St., Oscoda 48750
OSCODA - Courthouse Annex, P.O. Box 268, Mio 48647

DISTRICT HEALTH DEPARTMENT #3

Dean Mikulski, R.S., 203 Antrim St., Charlevoix 49720 (*CHARLEVOIX COUNTY)
ANTRIM - County Building, Bellaire 49615
EMMET - 116 W. Mitchell St., Petoskey 49770
OTSEGO - 826 North Court Street, Gaylord 49735

DISTRICT HEALTH DEPARTMENT #4

Larry Losinski, R.S., 719 W. Chisholm, Alpena 49707 (*ALPENA COUNTY)
CHEBOYGAN - 870 S. Main St., Cheboygan 49721
MONTMORENCY - P.O. Box 183, Atlanta 49709
PRESQUE ISLE - 1400 Larke Ave., Rogers City 49779

DISTRICT HEALTH DEPARTMENT #5

Michael Nelson, R.S., Courthouse, White Cloud 49349 (*NEWAYGO COUNTY)
LAKE - Courthouse, Baldwin 49304
OCEANA - 114 Dryden, P.O. Drawer 72, Hart 49420

MICHIGAN DEPARTMENT OF PUBLIC HEALTH
Northern Peninsula Office
Cletus Courchaine, Engineer-in-Charge
305 Ludington Street
Escanaba, Michigan 49829

Note: The following city health departments also provide environmental health services:

DETROIT CITY HEALTH DEPARTMENT

Harry Boyle (Sanitary Engineering)
William L. Young (Food Service)
Herman Kiefer Health Complex
1151 Taylor
Detroit 48202

HIGHLAND PARK HEALTH DEPARTMENT

Anthony P. Miano, M.P.H., 351 Glendale Ave., Highland Park 48203

HOLLAND CITY DEPARTMENT OF ENVIRONMENTAL HEALTH

Roger Stroh, R.S., City Hall, Holland 49423

For further information concerning local health department sanitarians, contact the Michigan Department of Public Health, 3500 North Logan Street, Lansing, Michigan 48909
Telephone: (517) 373-1373

* Indicates the county in which the main office of the health department is located.

For counties not listed in alphabetical sequence, see Cross Reference Table on reverse side.

CROSS REFERENCE TABLE FOR COUNTIES NOT LISTED IN
ALPHABETICAL SEQUENCE ON REVERSE SIDE

Alcona - District Health Department #2
Alger - Luce-Mackinac-Alger-Schoolcraft District Health Department
Alpena - District Health Department #4
Antrim - District Health Department #3
Arenac - Central Michigan District Health Department
Baraga - Western Upper Peninsula District Health Department
Benzie - Grand Traverse-Leelanau-Benzie District Health Department
Charlevoix - District Health Department #3
Cheboygan - District Health Department #4
Clare - Central Michigan District Health Department
Clinton - Mid-Michigan District Health Department
Crawford - District Health Department #1
Eaton - Barry-Eaton District Health Department
Emmet - District Health Department #3
Gladwin - Central Michigan District Health Department
Gogebic - Western Upper Peninsula District Health Department
Gratiot - Mid-Michigan District Health Department
Hillsdale - Branch-Hillsdale-St. Joseph District Health Department
Houghton - Western Upper Peninsula District Health Department
Iosco - District Health Department #2
Iron - Dickinson-Iron District Health Department
Isabella - Central Michigan District Health Department
Kalkaska - District Health Department #1
Keweenaw - Western Upper Peninsula District Health Department
Lake - District Health Department #5
Leelanau - Grand Traverse-Leelanau-Benzie District Health Department
Mackinac - Luce-Mackinac-Alger-Schoolcraft District Health Department
Mason - Manistee-Mason District Health Department
Menominee - Delta-Menominee District Health Department
Missaukee - District Health Department #1
Montcalm - Mid-Michigan District Health Department
Montmorency - District Health Department #4
Newaygo - District Health Department #5
Oceana - District Health Department #5
Ogemaw - District Health Department #2
Ontonagon - Western Upper Peninsula District Health Department
Osceola - Central Michigan District Health Department
Oscoda - District Health Department #2
Otsego - District Health Department #3
Presque Isle - District Health Department #4
Roscommon - Central Michigan District Health Department
St. Joseph - Branch-Hillsdale-St. Joseph District Health Department
Schoolcraft - Luce-Mackinac-Alger-Schoolcraft District Health Department
Wexford - District Health Department #1

APPENDIX F

REVIEW OF LEGAL OPINION

LAW OFFICES
BOOTH, PATTERSON, LEE, KARLSTROM & STECKLING
1080 WEST HURON STREET
PONTIAC, MICHIGAN 48053
(313) 681-1200

CARL-GUNNAR KARLSTROM
PARVIN LEE, JR.
J. TIMOTHY PATTERSON
JOHN W. STECKLING
DAVID J. LEE
THOMAS L. GRUICH
GARY L. DOVRE
GREGORY K. NEED

OF COUNSEL
DOUGLAS W. BOOTH
CALVIN E. PATTERSON

April 22, 1980

Mr. Carl Stapleton
Johnson & Anderson, Inc.
P. O. Box 1166
2300 Dixie Highway
Pontiac, Michigan 48056

Re: Ownership of Great Lakes Islands

Dear Mr. Stapleton:

Our opinion has been requested regarding a question as to the ownership of certain Great Lake islands within the boundaries of the State of Michigan. Specifically, we have been asked whether or not there is authority to conclude that the State of Michigan has title to all islands in the Great Lakes region within its boundaries.

It is our opinion that title to all islands, whether naturally made or man made, within the boundaries of the State of Michigan, rests in the State of Michigan, for reasons as more particularly described herein. This opinion conforms to that of the U.S. Solicitor General, dated December 20, 1963, hereafter cited as "opinion", which you have provided to us for our review.

Initially, we would point out that the Solicitor General in his opinion, posed certain assumptions from which he narrowed the question presented to that of whether land naturally formed as islands in the marginal sea, within the boundaries of an admitted State but before the enactment of the Submerged Lands Act, belongs to the States, (and their grantees) or to the United States.

The first assumption made by the Solicitor General is that "sovereignty over islands existing when a state was admitted to the Union, passed to the State". (Opinion, pg.6)

We would note that, as the Solicitor General discussed, this assumption does not mean that title to these lands necessarily passed to the State upon admission. The United States may have transferred title to some of these islands to private hands prior to the admission of Michigan into the Union in 1837, or the United States may have reserved title to some of these islands. An examination of title records will be necessary to determine whether any of these grants or reservations occurred.

In the case of United States v Chandler-Dunbar Water Power Company, [206 US 447 52 LED 881 28 S.Ct. 579 (1908)] it was held that certain small islands situated in the St. Marys River were transferred to the State of Michigan through the act of admission of the State into the Union. The islands in question contained respectively a small fraction of an acre and a little more than an acre. This case was one of a long line of cases, establishing the proposition that title to the lands in question passed to the State, a line of cases which was over-ruled by the Supreme Court in United States v California, 332 US 19 91 LEd 1889, 67 S.Ct. 1658 (1947), and subsequently reinstated through passage of the Submerged Lands Act, discussed later.

The second assumption made by the Solicitor General is that "islands in the marginal sea formed after May 22, 1953, belong to the State as the owner of the bed" (opinion pg. 6, citing City of St. Louis v Rutz, [168 (138)U.S. 226, 247].

The third assumption made by the Solicitor General is that the plain language of the Submerged Lands Act, discussed herein, specifically grants title to man-made islands to the States. (Opinion, Section I)

With the qualification regarding assumption number one discussed above, we find no reason to dispute these assumptions made by the Solictor General, and therefore submit that the only question remaining is whether the islands naturally formed in the marginal sea after the state was admitted to the Union, but before enactment of the Submerged Lands Act, (May 22, 1953) belong to the State or the United States.

The operative statute is the Submerged Lands Act, 43 USC 1301 et seq.

43 USC §1311a provides that:

> It is determined and declared to be in the public interest that (1) title to and ownership of the lands beneath navigable waters within the boundaries of the respective States, and the natural resources within such lands and waters, and (2) the right and power to manage, administer, lease, develop, and use the said lands and natural resources all in accordance with applicable State law,be, and they are, subject to the provisions hereof, recognized, confirmed, established, and vested in and assigned to the respective States or the persons who were on June 5, 1950, entitled thereto under the law of the respective States in which the land is located, and the respective grantees, lessees, or successors in interest thereof;
>
> (b) (1) The United States releases and relinquishes unto said States and persons aforesaid, except as otherwise reserved herein, all right, title, and interest of the United States, if any it has, in and to all said lands, improvements, and natural resources;...

The exceptions referred to are found in 43 USC §1313, which provides that:

> There is excepted from the operation of Section 1311 of this title -
>
> (a) all tracts or parcels of land together with all accretions thereto, resources therein, or improvements thereon, title to which has been lawfully and expressly acquired by the United States from any State or from any person in whom title had vested under the law of the State or of the United States, and all lands which the United States lawfully holds under the law of the State; all lands expressly retained by or ceded to the United States when the State entered the Union (otherwise than by a general retention or cession of lands underlying the marginal sea); all lands acquired by the United States by eminent domain proceedings, purchase, cession, gift, or otherwise in a proprietary capacity; all lands filled in, built up, or otherwise reclaimed by the United States for its own use; and any rights the

United States has in lands presently and actually occupied by the United States under claim of right;

(b) such lands beneath navigable waters held, or any interest in which is held by the United States for the benefit of any tribe, band or group of Indians or for individual Indians; and

(c) all structures and improvements constructed by the United States in the exercise of its navigational servitude. May 22, 1953, c. 65, Title II, § 5, 67 Stat. 32.

The critical question therefore involves the definition of the term "lands beneath navigable waters". 43 USC 1301 provides that:

(a) The term "lands beneath navigable waters" means -

(1) all lands within the boundaries of each of the respective States which are covered by nontidal waters that were navigable under the laws of the United States at the time such State became a member of the Union, or acquired sovereignty over such lands and waters thereafter, up to the ordinary high water mark as heretofore or hereafter modified by accretion, erosion, and reliction;

(2) all lands permanently or periodically covered by tidal waters up to but not above the line of mean high tide and seaward to a line three geographical miles distant from the coast line of each such State and to the boundary line of each such State where in any case such boundary as it existed at the time such State became a member of the Union, or as heretofore approved by Congress, extends seaward (or into the Gulf of Mexico) beyond three geographical miles, and

(3) <u>all filled in, made, or reclaimed lands which formerly were lands beneath navigable waters, as hereinabove defined</u>; (emphasis added)

We, as the Solicitor General, have been unable to find any cases which would apply to the question at hand. However, the

case law which does deal with the Submerged Lands Act, contained no language which would contradict the opinion formed herein. In United States v Florida, 425 US 791, 48 L.Ed. 2d 388, 96 S. Ct. 1840, (1976), the Court's decree stated that "as against the United States, the State of Florida is entitled to all the lands, minerals, and other natural resources underlying the Atlantic Ocean extending seaward from its coastline for a distance of three geographical miles, and the United States is not entitled, as against the State of Florida, to any interest in such land, minerals or resources, with the exceptions provided by Section 5 of the Submerged Lands Act..." (Section 5 is 43 USC §1313, quoted above)

Similar language is found in the final decree of the United States v Louisiana, et al, supplemental decree, 409 U.S. 17, 34 L.Ed. 2d. 705, 93 S. Ct. 1478 (1972), and United States v California, 381 U.S. 139, 14 L.Ed. 2d. 296, 85 S. Ct. 1401, hearing denied 382 U.S. 80, 15 L.Ed. 2d. 127, 86, S.Ct. 159 (1964).

It must be stressed that all the preceding cases dealt with the question of the location of the boundary to be used to calculate the three mile limit. The question of ownership of islands, whether naturally made or man-made, does not arise in any case law interpreting the Submerged Lands Act.

The only authority which deals with this specific question is the Solicitor General's opinion referenced above, and the opinion rendered by the Department of the Interior in the Floyd A. Wallis case, (opinion, pg. 7) which was reversed by the opinion of the Solicitor General. Initially, it should be pointed out that the Solicitor General's opinion should not be considered as binding authority in any court of law. It is merely an expression of opinion by an attorney, albeit the top attorney representing the federal government. However, the document should be taken to be no more than what it purports to be, that is, an opinion.

With the above in mind, since you are familar with the Solicitor General's opinion, for sake of clarity I will follow the organizational pattern found in that opinion.

Basically, in support of his opinion, the Solicitor General explored three areas of legal analysis:

1. An application of the rules of statutory construction to the words of the Submerged Lands Act.

2. An analysis of the legislative history behind the passage of the Submerged Lands Act in order to determine the intent of the Congress in passing the Act.

3. Policy argument which would support the conclusions reached.

With respect to the initial line of analysis, we should first point out that every interpretation of a statute requires that certain rules and principals be employed. These rules and principals are what are known as "rules of statutory construction". In summary, we support the conclusion reached by the Solicitor General that application of both principals of statutory construction as well as literal dictionary definitions are not definitive to resolve the issue presented.

With respect to the second line of analysis, that of examining legislative history to determine legislative intent, we would first point out that in an independent examination by ourselves of the legislative history of the Act would be impossible within the time limit put on this opinion. We would merely note that the legislative history found in 1953 USC Congressional Administrative News, pages 1385 through 1640 is accessible, and can be examined if desired. We will, for purposes of this discussion, rely upon the summaries provided by the Solicitor General in his opinion and by the Supreme Court in United States v Louisiana, 363 US 14 L.E2d. 1025, 80 S.Ct. 961 (1960), which contains an excellent summary of the legislative history of the Act.

After examining the foregoing, we again must conclude along with the Solicitor General that the legislative history does not clearly show that Congress had any intention either to retain or release naturally made islands. However, to the extent that it can be determined that the intent of the Submerged Lands Act was to restore to the State what was withdrawn by U.S. v California, supra, we would concur with the Solicitor General that the legal theory behind the passage of the Submerged Lands Act does not support distinction between naturally made and man-made islands.

Finally, with respect to the policy argument, it is our opinion that here the greatest support can be found for reaching the conclusion that no distinction should be made between naturally made and man-made islands. The central elements of this argument rest upon the proposition that to make such a distinction would create imprecise arbitrary distinctions which would require much complicated litigation to resolve.

While we agree with the Solicitor General as to the questions presented, we additionally would point out that the federal government has retained certain powers which might affect use made of these islands. The title of the State of Michigan is subject to federal appropriation, use, development, improvement and control for purposes of navigation, flood control, production of power and the national defense. 43 USC 1311 (d); 43 USC 1314.

Section 6 of the Submerged Lands Act, 43 USC 1314 provides, in pertinent part, that:

> (a) The United States retains all its navigational servitude and rights in and powers of regulation and control of said lands and navigable waters for the constitutional purposes of commerce, navigation, national defense, and international affairs, all of which shall be paramount to, but shall not be deemed to include, proprietary rights of ownership, or the rights of management, administration, leasing, use, and development of the lands and natural resources which are specifically recognized, confirmed, established, and vested in and assigned to the respective States and others by section 1311 of this title. (emphasis added)
>
> (b) In time of war or when necessary for national defense, and the Congress or the President shall so prescribe, the United States shall have the right of first refusal to purchase at the prevailing market price, all or any portion of the said natural resources, or to acquire and use any portion of said lands by proceeding in accordance with due process of law and paying just compensation therefor.

Of course, the invoking of these powers would require affirmative action of the federal government as well as the payment of just compensation. However, it must be stressed that this power is present within the federal government, and that this possibility must be kept in mind.

There are also Michigan statutes which authorize the State to convey lands to the federal government in certain circumstances. 1874 PA 4; 1955 PA 247; the Michigan Submerged Lands Act.

We have not discussed Michigan statues and case law in this opinion for the reason that the constitutional doctrine of the federal supremacy mandates that the law in this area is made by the federal government. The State of Michigan cannot acquire title to these islands vs. the federal government through actions of its own.

There are additional areas of inquiry with respect to this general area of law. Upon request, we could:

1. Examine Michigan statutes and case law to determine the regulatory scheme, if any, in this area.

2. Examine statutes and case laws from other states to determine how these other jurisdictions have regulated this area, if at all.

For the foregoing reasons, and subject to the qualifications expressed herein, we concur in the opinion expressed by the Solicitor General and conclude that title to islands resting within ghe boundaries of the State of Michigan within the Great Lakes is in the State of Michigan and its successors and assigns and not in the United States Government.

If you have any questions about any of the foregoing, please feel free to contact me.

Very truly yours,

BOOTH, PATTERSON, LEE, KARLSTROM
& STECKLING

Gregory K. Need

GKN/jaf