

## Appendix C: Land Protection Plan

### Land Protection Plan for the Expansion of Green Bay and Michigan Islands National Wildlife Refuges (NWR, Refuge)

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Green Bay NWR: Door County, Wisconsin and Delta County, Michigan

Michigan Islands NWR: United States Portions of Lakes Superior, Huron, and Michigan

#### Key Points

- Protection of additional **Great Lakes island habitat** critical for **rare and declining species** as well as other unique, **underrepresented habitats**
- Preservation of stopover sites along key **bird migration corridors**
- **Highly vulnerable** to climate change, colonization by invasive species, and development
- **Acquisition priority based** on criteria from the **Conserving the Future** vision document
- Acquisition by a **combination of fee title and less-than-fee title** is preferred
- Diverse ownership patterns encourage potential **partnering** with other conservation agencies



## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Washington, D.C. 20240



In Reply Refer To:  
FWS/ANRS/052804

JAN 15 2013

### Memorandum

To: Regional Director, Region 3

From: Director

Subject: Approval to Proceed with Publication and Distribution of the Final Planning Documents for the Expansion of the Green Bay National Wildlife Refuge in Wisconsin, and Michigan Islands National Wildlife Refuge in Michigan

I approve your request dated September 28, 2012, to expand both the Green Bay NWR by 4,133 acres and also the Michigan Islands NWR by 10,000.

This request is based on the preferred alternative (Alternative C) in the Comprehensive Conservation Plan covering Green NWR, Michigan Islands NWR, Gravel Island NWR, Harbor Island NWR, and Huron NWR, collectively referred to as the Great Lakes Islands NWR, which was initiated in February, 2009. Public participation was solicited during the planning process. Federal, State, and local governments, as well as private organizations and citizens have provided input.

The Decision Package you submitted for my review included an Environmental Assessment, Land Protection Plan, and other related documents indicative of detailed planning. These documents comply with the requirements of the Director's land acquisition planning procedures memo dated August 11, 2000.

The lands targeted for protection will assist the refuge in addressing three priority conservation objectives: recovering listed threatened and endangered species, conserving migratory birds in decline, and protecting highly threatened island habitat that is underrepresented and unique.

Attachments

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## Introduction

With over 32,000 islands, the North American Great Lakes contain the largest collection of freshwater islands in the world. Extremely variable in nature, from size to complexity, these islands contain amazing biodiversity. However, many of them with the highest biodiversity are also under the greatest threat from human activity. Therefore, in 1996, a Preliminary Project Proposal (PPP) was approved to begin detailed planning for the addition of up to 4,133 acres in the Grand Traverse archipelago and an unknown amount in the upper end of Green Bay to Green Bay NWR (figure C-1). Likewise, in 2010 a PPP was approved to begin detailed planning to consider expansion of Michigan Islands NWR by approximately 10,000 acres within Lake Michigan and the United States' portions of Lakes Superior and Huron (figure C-1). This Land Protection Plan (LPP) is a portion of the detailed planning initiated by the approval of both PPPs.

In 2009, an Environmental Assessment (EA) and Draft Comprehensive Conservation Plan (CCP) were initiated for both these refuges as well as other refuges in the Great Lakes (i.e., Gravel Island, Huron, and Harbor Island NWRs). Expansions of these two refuges are part of the preferred alternative in the CCP. The purpose of this LPP is to provide information to the public in a clear and concise format outlining resource protection needs, the implementation schedule and priorities, and the dimensions of Service preservation proposals.

The following factors, consistent with U.S. Fish and Wildlife Service (FWS, Service) policy, generally guide land acquisition:

- The Service establishes new national wildlife refuges and expands existing refuge boundaries in order to fulfill the mission and goals of the National Wildlife Refuge System (NWRS, Refuge System) and the purpose(s) of individual refuges within the Refuge System.
- The Service acquires land only when other means of achieving program goals and objectives, such as zoning or regulation, are not appropriate, available, effective, or consistent with Service purpose and direction.
- The Service acquires land and water interests including, but not limited to, fee title, easements, leases, and other interests. Donations of desired lands or interests are encouraged.
- The Service respects the rights and interests of private landowners. Service policy has been and continues to be that land is purchased from willing sellers. As a result, the lands within a given project boundary that are of greatest interest to the Service because of their biological importance are not necessarily the first made available by willing sellers. In some cases lands within a project boundary may never become available for purchase.
- Law requires the Service to offer fair market value when acquiring lands. The Service must offer to buy the whole property when acquisition of only a portion of the property would leave the owner with an uneconomic remnant. The Service strives to minimize or eliminate any adverse impact on the landowner due to the acquisition process.

## Proposed Action and Objective

The proposed action is to permanently protect additional (strategically prioritized) island habitat (approximately 14,133 acres) in the Great Lakes by expanding Green Bay and Michigan Islands NWRs. As more thoroughly explained below, many of the Great Lakes islands:

- Harbor significant biodiversity;
- Support endangered, threatened, and candidate species;
- Serve as important breeding and staging areas for colonial nesting waterbirds;
- Provide re-fueling stopover sites for migrating birds; and
- Contain relict, unusual, and high quality plant and wildlife communities.

Many of the qualities that make Great Lakes islands unique also make them vulnerable to a variety of threats, with climate change, invasive species, and residential development topping the list. The acquisition priority of each island is based on criteria set forth by the Conserving the Future vision Strategic Growth implementation team. The guiding document for this team is *Conserving the Future: Wildlife Refuges and the Next Generation* (FWS, 2011). This document states, “The **future growth of the Refuge System** will be guided by the following priorities: habitats to fulfill the goals and objectives identified in **threatened and endangered species recovery** or habitat conservation plans; habitats to fulfill the goals and objectives identified in **national bird . . . management plans; habitats** that are **unique, rare, declining or under-represented** in existing protection efforts; climate refugia . . . ; and modifications to existing refuge boundaries to adapt to climate change . . . ”

The objective then, of this proposal, is:

*To protect highly threatened Great Lakes islands’ habitat that is either underrepresented and unique; or critical for threatened and endangered species, focal colonial nesting waterbird species, or birds of conservation concern for Region 3 of the U.S. Fish and Wildlife Service.*

## Project Description

### Location and Size

#### Green Bay National Wildlife Refuge

Green Bay NWR (330.7 acres) currently consists of Hog Island (2 acres), Plum Island (325 acres), and Pilot Island (3.7 acres) (see map in CCP). The islands are located in Lake Michigan near Washington Island, off the tip of Wisconsin’s Door County Peninsula. Hog Island was set aside by Executive Order in 1913 as a preserve and breeding ground for native birds. Plum and Pilot Islands were transferred from the U.S. Coast Guard (USCG) to the Service in 2007. The islands were acquired to protect native bird habitat and endangered species habitat in the Great Lakes Basin Ecosystem. In 1970, Hog Island and Gravel Island NWR were designated as the Wisconsin Islands Wilderness. The refuge is managed by staff at Horicon NWR in Mayville, WI.

Hog Island supports a nesting colony of Herring Gulls and a few nesting Great Blue Herons and Red-breasted Mergansers. No development has occurred on Hog Island due to its small size, remoteness, and landing difficulties.

Portions of Plum and Pilot Islands were developed to serve as lighthouse facilities or lifesaving stations during the late 19th century. Plum Island essentially functions as a small ecosystem and retains natural qualities absent on the nearby mainland. Today Pilot Island supports nesting

colonies of Double-crested Cormorants and Herring Gulls. A handful of Great Blue Herons and Black-crowned Night-Herons also nest on Pilot Island.

All public use is prohibited on Hog and Pilot Islands due to ground nesting by migratory birds and the limited and treacherous access. Plum Island may offer public use opportunities in the future provided they are compatible with the refuge's purpose and mission.

## Michigan Islands National Wildlife Refuge

Michigan Islands NWR (744 acres) is comprised of nine islands in Lakes Michigan and Huron (see map in CCP). Thunder Bay (122 acres), Scarecrow (9 acres) and Sugar (144 acres) Islands in Thunder Bay (near Alpena, MI), and Charity (214 acres) and Little Charity (11 acres) islands in Saginaw Bay are managed by Shiawassee NWR in Saginaw, MI. Seney NWR has management responsibility for Gull (230 acres), Pismire (2 acres), Hat (11 acres), and Shoe (0.5 acres) Islands, part of the Beaver Island Group in the northern portion of Lake Michigan.

Shoe and Pismire Islands in Lake Michigan and Scarecrow Island in Lake Huron were the first acquired. Thunder Bay Island in Lake Huron was added in 1965 by a USCG/ Service agreement. The USCG ceded Lake Michigan's Gull Island to the Service in 1969. In 1970, Scarecrow, Pismire, and Shoe Islands were officially designated as Michigan Islands Wilderness Area. A sixth island was added to the refuge in 1995, when The Nature Conservancy (TNC) transferred Hat Island in Lake Michigan to the Service. Charity and Little Charity Islands in Lake Huron's Saginaw Bay were added to the refuge in 1999. The most recent addition to Michigan Island NWR was Sugar Island in December of 2010.

In 2000, Scarecrow and Thunder Bay Islands were designated part of the Thunder Bay National Marine Sanctuary and Underwater Preserve. The designation gives federal protection to over 100 well-preserved shipwrecks that litter the bottom of Thunder Bay, located near Alpena, MI. Once part of a major shipping channel, this 448-square-mile sanctuary is the first national marine sanctuary in fresh water and is located in an area that was known as "Shipwreck Alley" in the 1800s. Big Charity and Thunder Bay Islands have lighthouses and keeper's quarters.

The islands are used for nesting by American Redstarts, Herring and Ring-billed Gulls, Double-crested Cormorants, Great Blue Herons, Black-crowned Night-Herons, and Common and Caspian Terns. Thunder Bay Island is a rare, distinctive, alvar ecological community with a little bluestem alvar grassland, alvar pavement, and a limestone bedrock lakeshore. The refuge is closed to the public.

## Joint Detailed Planning

This LPP is a joint detailed effort for both of the aforementioned PPPs. The approved study areas from both PPPs were initially reduced by eliminating the western portion of Lake Superior and Lake St. Clair between Lakes Huron and Erie (figure C-1, Initial Focus Area). This was primarily due to the large amount of public land, state parks, national parks, etc. and heavy development on much of the remaining private land already existing in these areas. Then, a GIS analysis, based on data representing three priorities set forth by the Conserving the Future vision Strategic Growth implementation team, was used to prioritize islands for future protection. The three priorities include:

- Presence of federal threatened, endangered, and candidate species;

- Presence of birds in decline; and
- Presence of underrepresented unique habitat types.

In particular for this project, the “birds in decline” included three Upper Mississippi River/Great Lakes Region Joint Venture (UMR/GLRJV ) focal colonial nesting waterbird species (i.e., Common Tern, Black Tern, and Black-crowned Night-Heron) and Forester’s Tern (per communication with a Region 3 migratory bird biologist) as well as 20 other species (table C-1) on the 2008 Region 3 Birds of Conservation Concern (BCC) List for Bird Conservation Regions (BCR) 12 and 23 (FWS, 2008). The BCC species use islands for stop-over sites to rest and refuel during migration as well as for breeding.

Also, in particular for this project, the “underrepresented unique habitat types” is based on the presence of key ecological systems (which includes rare plant communities and globally rare communities) from the *Islands of Life: A Biodiversity and Conservation Atlas of the Great Lakes Islands* study published by TNC of Canada in 2010 (Henson et al., 2010).

All islands (68) known to have threatened, endangered, and candidate species or colonial nesting waterbirds present were considered a priority, except seven of the largest and most developed (i.e., Sugar – 31,574 acres, Bois Blanc – 23,660 acres, Washington – 14,362 acres, Drummond – 83,258 acres, Beaver – 36,787 acres, Neebish – 13,768 acres, North Manitou – 14,415 acres) and one that is known to contain environmental contaminants (Shelter Island). While these islands contain priority species and critical habitat for the endangered Hine’s emerald dragonfly (Washington and Bois Blanc), their highly developed nature more easily lends itself to handling any potential acquisition on a case-by-case basis. Three other islands (in addition to the 60 islands mentioned above) also contain critical habitat for the Hine’s emerald dragonfly and, therefore, were considered a priority as well. These 63 priority islands were then ranked based on the sum of normalized scores for the presence of those species as well as the 20 BCC and “underrepresented unique habitat types.” So, the higher the final score, the more rare and declining species and habitat types the island contains (figures C-2 through C-6 and tables C-2 and C-3).

In the event that two or more priority islands become available for protection at the same time, threat potential could be used to prioritize them. Based on extrapolation from a crude analysis of existing “highly developed” islands, larger islands and those within five miles of the mainland appear to be more threatened by future development. Therefore, size and proximity to the mainland should be considered when poised with the option to buy two or more different priority islands at the same time with limited funding. “Highly developed” islands considered in the crude analysis mentioned above were determined by threat scores obtained from the *Islands of Life* study and are primarily based on housing density but also include roads, cropland, quarries, and mines.

The priority island analysis described above is essentially a model, which is based on three criteria that are part of the future vision of the Refuge System. The data used in the model may change over time, with more complete or more accurate information as it becomes available—for example, if a new island is found to have an endangered species. However, the model and the criteria it’s based on should not change until the vision of the Refuge System changes. Therefore, the 63 islands in figures C-2 through C-6 and tables C-2 and C-3 are the highest priority for growing the Refuge System today. In ten years with new data, assuming the Refuge System visions holds constant, the model may deliver a list of slightly different islands, perhaps

more or fewer that are of high priority. The list of high priority islands to acquire may change over time, therefore, allowing this proposal to be adaptable.

## Description of Habitat

The priority islands contain a variety of habitat types. Table C-5 shows the major and generally more common habitats found on some of the islands. Rare habitats including rare plant communities and globally rare communities, represented here by “key ecological systems,” occur on nearly 75 percent of the priority islands as well. The “key ecological systems” include the following:

- True alvar (grassland, savanna, and sparsely vegetated rock barrens that develop on flat limestone where soils are very shallow);
- Other alvars (including anthropogenic);
- Wetlands (swamp, marsh, bog, fen, muskeg);
- Grass and meadow;
- Prairie and savanna;
- Limestone plain forest complexes (this forest is likely to have more rare species and community types);
- All top scoring terrestrial blueprint systems (TNC, U.S. Great Lakes terrestrial portfolio); and
- All top scoring aquatic blueprint systems (TNC, U.S. Great Lakes aquatic portfolio).

Alvars thrive where environmental extremes (e.g., seasonal hot, cold, drought, and flood) create naturally open landscapes, and therefore contain their own distinctive ecology. They support a unique set of plants—uncommon wildflowers, mosses and lichens, many kinds of grasses and sedges, and even some stunted trees. Animals common to alvars include birds, land snails, leafhoppers, and other invertebrates.

Limestone plain forest complexes include coniferous, deciduous, and mixed forests. They can be dominated by species like white cedar, white spruce, aspen, and white birch. They often include a complex patchwork of wetlands and naturally open areas of thin soil over limestone or bedrock, which hosts a distinctive vegetation community, including a considerable number of rare plants.

## Major Wildlife Values

The priority islands also contain a variety of wildlife that colonizes islands through a variety of means. Species such as reptiles and amphibians can float on debris; birds such as gulls can carry seeds on their feet and feathers; migratory birds use islands as stop-over sites, and some stay to breed; mammals such as black bears, coyotes and wolves can swim or walk on ice to reach islands. Other species arrive through deliberate or accidental anthropogenic introductions. Twenty-three of the priority islands also contain threatened, endangered, and candidate species including the following:

- Piping Plover (endangered)
- Pitcher's thistle (threatened)
- Houghton's goldenrod (threatened)
- Dwarf lake iris (threatened)
- Eastern massasauga rattlesnake (candidate species)

Piping Plover (*Charadrius melodus*) pairs have been documented nesting for one or more years on eight (six priority) islands since the mid-1980s. Historically they bred extensively on the coastal sand and gravel beaches and fore-dunes of Great Lakes islands. However, the number of nesting pairs declined drastically in the 1940s and 1950s with increased shoreline development. Threats include predation, degradation of habitat (primarily from shoreline development), and human disturbance. Emerging potential threats include disease, wind turbine generators, and climate change.

Pitcher's thistle (*Cirsium pitcheri*) is found only in the Great Lakes Region and occurs in dune grasslands. The eleven (eight priority) islands on which it occurs contain some of the largest populations of this species. Bees and butterflies are important pollinators of Pitcher's thistle, and its seeds are dispersed by wind and water. Pitcher's thistle is adapted to a changing environment; however, intensive foot and vehicular traffic can increase erosion, destroy vegetation, and introduce competitive non-native species.

Houghton's goldenrod (*Solidago houghtonii*) was first discovered in Mackinac County, Michigan and grows nowhere else in the world outside the Great Lakes. It occurs on eight (six priority) islands and is typically found on moist sandy beaches and shallow depressions between low sand ridges along the shoreline (interdunal wetlands). Fluctuating water levels of the Great Lakes play a role in maintaining this unique goldenrod. During high water years, colonies of Houghton's goldenrod may be submerged. When water levels recede some plants survive the inundation, and new seedlings establish on the moist sand.

Dwarf lake iris (*Iris lacustris*) grows on alvar barrens only around the Great Lakes. The lakeshore habitat of dwarf lake iris has been greatly reduced by shoreline development, and it now resides only on 16 (12 priority) islands. Residential and vacation homes as well as associated road-widening, chemical spraying and salting, and off-road vehicle use have caused disturbance and destruction of habitat.

Eastern massasauga rattlesnake (*Sistrurus catenatus*) occurs on three (two priority) islands with wetlands or shrub swamps with adjacent natural habitat in the uplands, including drier open shrub forest, open fields, grassy meadows, etc. This snake is a federal candidate species for which the Service has sufficient information on its biological status and threats to propose them as endangered or threatened. Candidate species receive no legal protection; however, conservation is encouraged since they may warrant future protection under the Endangered Species Act. Primary threats to the snake include human harassment and loss of wetland habitat.

Three islands contain critical habitat (habitat believed to be essential to the species' conservation) for the Hine's emerald dragonfly (*Somatochlora hineana*). The Hine's emerald dragonfly is among the most endangered dragonflies in the United States and is restricted to wetland habitats characterized by thin soils over dolomite bedrock with marshes, seeps, and

sedge meadows. Fragmentation and destruction of suitable habitat are believed to be the main reasons for this species' endangered status and continue to be the primary threats to its recovery.

## Migration Corridors

Several of the priority islands also occur within Important Bird Areas (IBAs). The American Bird Conservancy's IBA program is a global effort to identify and protect areas that are exceptionally important, even essential, for bird conservation (figure C-1). The program not only recognizes the sites as important, but mobilizes resources needed to protect them.

The large shallow Saginaw Bay of Lake Huron is one IBA that is used by an array of waterbird species as a migratory stopover site, wintering ground, and breeding ground. Large migratory congregations of Tundra Swans, American Black Ducks, Mallards, Redheads, Common Goldeneyes, Mergansers, and Scaup have all been recorded in this area. Several important waterbird breeding colonies also exist within this IBA, including Common Tern, Caspian Tern, Ring-billed Gull, Great Egret, and Black-crowned Night-Heron. This area also supports the lower peninsula's largest spring raptor migration, with at least 18 species of hawks, eagles, vultures, and falcons concentrated in areas from Caseville, MI to Huron City, MI, up to two miles inland and occasionally over water. This IBA sits within an area of one of the state's largest wind power resources and is being targeted for several wind farms. At least one project is already completed (Harvest Wind Farm).

The area from Sturgeon Bay, between St. Ignace, MI and Mackinaw City, MI, over to Saint Martin Bay (including Bois Blanc Island) is a key migration corridor. Since migratory birds (especially raptors) avoid crossing large bodies of water during migration, this area is an important migration route. Raptors (especially Bald Eagles) and songbirds "island hop" along this route and, therefore, concentrate in and around peninsulas. Two other key migration corridors encompassing priority islands for acquisition include the following:

- The area from Grand Traverse Bay north toward Naubinway, MI, including North and South Manitou Islands, North and South Fox Islands and Beaver Island; and
- The chain of islands from the Door County Peninsula in Wisconsin to the Delta County Peninsula in Michigan (Big Bay de Noc), including Washington Island.

## Potential Population Benefit Examples

Due to the large number of bird species occurring in the Great Lakes and Big Rivers Region (Region 3, also known as the Midwest Region) of the Service and the limited resources available for conservation, the UMR/GLRJV selected several "JV focal species" for breeding habitat planning and population monitoring. The use of focal species is a conservation shortcut, reducing the number of models required for developing habitat objectives for a full suite of species. In effect, JV focal species were selected to represent cover types used by multiple species within that bird group. Monitoring results (i.e., population change) based on focal species are assumed to reflect the suite of species they represent. The following three species are provided as possible examples of how the proposed expansion could benefit such colonial nesting waterbird populations. The habitat objectives for protection, breeding territory size, and habitat requirements (area, type, etc.) are all from the UMR/GLRJV Waterbird Conservation Strategy completed in 2007.

Black Terns have been recorded nesting in three wetlands adjacent to priority islands. Their habitat needs include marshes with extensive stands of emergent vegetation and large areas of open water. The minimum habitat area required per colony is 50 acres with an average of 40 birds per colony. The estimated area of quality habitat needed to accommodate current breeding populations is 23,350 acres. Acquiring the colony nest sites on those three islands would maintain and protect existing habitat for approximately 120 Black Terns (60 breeding pairs).

Black-crowned Night-Herons have used 15 of the 63 priority islands and prefer large marshes with a mix of open water, herbaceous vegetation, and nearby woody cover. The minimum habitat area required per colony is nearly 500 acres with an average of 220 birds per colony. The estimated area of quality habitat needed to accommodate current breeding populations is 29,160 acres. Acquiring the colony nest sites on those 15 islands would maintain and protect existing habitat for approximately 3,300 Black-crowned Night-Herons (1,650 breeding pairs).

Common Terns have used 16 of the 63 priority islands and primarily need large lakes often with marsh habitat and abundant small forage fish available from the surface. They prefer island or peninsula nest sites with sand, gravel, shell, or cobble substrates and scattered vegetation. A typical colony is 100 breeding pairs (200 birds) on a 400 square meter site (0.1 acres). The estimated area of quality habitat needed to accommodate current breeding populations is 38 islands and associated territories. Acquiring the colony nest sites on those 16 islands would maintain and protect existing habitat for approximately 3,200 Common Terns (1,600 breeding pairs).

## **Threat to and Status of Resources to be Protected**

Size, isolation, physical location, parent material, wave action exposure, fluctuating water levels, climate, and age all contribute to the biodiversity and distinctiveness of the islands in the Great Lakes. In particular, climate (where some islands experience warmer winters, later springs, and cooler summers) and location (such as separation from the mainland) allow some of the islands to act as refugia with extremely diverse biota, often genetically and ecologically divergent from mainland populations (Vigmostad et al., 2007). Not surprisingly then, some islands contain threatened, endangered, and candidate species and some provide the most significant nesting and dry-land roosting habitat for colonial nesting waterbirds (Wires et al., 2010).

Some of the characteristics that make these islands so diverse and distinct also make them the most vulnerable. In particular, the relatively small size and isolation of islands makes them subject to quick change by both natural and anthropogenic forces. Fluctuating water levels, increases in deer density and colonization, and abandonment by colonial nesting waterbirds have all triggered fast ecological change on islands in the past (Vigmostad et al., 2007).

This combination of unique diversity and vulnerability subject these islands to several significant threats. Climate change, colonization by invasive species, and development (mostly residential) top the list (Wires et al., 2010). Some examples include the following:

- Islands that are distant from the mainland generally experience less predation, less competition, and are less disturbed by humans; however, they are often more vulnerable to storm-driven waves and climate-induced water level change.

- Islands that are isolated often contain unique floral communities; however, colonization by invasive species, particularly plants, quickly changes their structure, composition, and character.
- Larger islands (and sometimes closer to the mainland) often contain habitat for rare or declining species, however, those qualities also promote development and colonization by humans.

Climate change will likely add another layer of stress to the Great Lakes and, therefore, the islands within them, as they are particularly susceptible to the effects of rapid global warming (Wires et al., 2010). Water temperatures are expected to rise—with an expected average air temperature increase of 2–4 °C—reducing seasonal mixing and biomass productivity (i.e., reduced aquatic organisms that form the base of the food chain), and decreasing water quality characterized by increased algal blooms (Wires et al., 2010). Precipitation is expected to increase 25 percent by the end of the 21<sup>st</sup> century; however, lake water levels are predicted to fall (by the year 2100) due to the increased temperatures and related evaporation. This could create new mainland connections and, therefore, increase predation, competition, and disturbance. While some level of adaptation is expected for some species, certain barriers and invasive species will likely limit that adaptation. Losses then, in local biodiversity, are likely to accelerate towards the end of the 21<sup>st</sup> century (Wires et al., 2010).

Other lingering threats, including wind turbine generators, increased recreation (especially foot and vehicular traffic), and disease will also add to the vulnerability of these island systems.

## Protection Alternatives

### Alternative 1 – No Action

The No-Action Alternative includes no expansion or additional acquisition by Green Bay or Michigan Islands NWRs. The existing islands within these two refuges would remain in the Refuge System, and management of them would continue as currently planned. This alternative is not preferred, because it does not increase protection of high priority habitat that will help the Service achieve the following important priorities:

- Threatened and endangered species recovery plan goals;
- Joint Venture waterbird population objectives; and
- A trend reversal for other “birds in decline.”

While this alternative would be the least expensive approach, it does not meet the objective of this proposal.

### Alternative 2 – Acquisition and/or Management by Others (State, County, Non-Governmental Organizations, etc.)

In Alternative 2, Green Bay and Michigan Islands NWRs would be expanded based on the priority list generated above; however, acquisition and/or management of that expansion would be undertaken by a partner agency and not by the Service. This alternative is not preferred, because other partner agencies are unlikely to have sufficient funds for acquisition or adequate

staff for management. The Service is the principal federal agency responsible for administering the Endangered Species Act and managing and conserving migratory birds in the United States. Therefore, threatened and endangered species as well as migratory birds are essential Service priorities. Partner agencies have their own unique missions, responsibilities, and priorities that differ from those of the Service. Conservation of the priority islands, then, may not be their first interest. This alternative would:

- Have minimal or no cost to the Service;
- Meet the objective of this proposal; however, it would
- Not be a reasonable option since partner agencies have not expressed interest in such acquisition and/or management.

### **Alternative 3 – Acquisition by Fee Title (Service)**

In Alternative 3, Green Bay and Michigan Islands NWRs would be expanded based on the priority list generated above through outright purchase of the islands at fair market value. That is, the Service would own all or portions of the islands acquired as part of the expansion. This alternative is not preferred, because some existing island owners may not be willing to sell their property to the Service. They may, however, be willing to sell and give up certain property rights to protect rare species and habitats. This alternative excludes the use of easements in which the Service would purchase development and other rights but not the actual property to protect rare species and their habitats. While this alternative would meet the objective of this proposal, it:

- Is likely the most costly option since all properties would be acquired outright (including all rights);
- May prove ineffective as many landowners may not be willing to sell their properties; and
- Is unnecessary as the Service can use less-than-fee title acquisition to conserve at least some rare species and their habitats.

### **Alternative 4 – Acquisition by Less-Than-Fee Title (Service)**

In Alternative 4, Green Bay and Michigan Islands NWRs would be expanded based on the priority list generated above through purchase of certain rights to the island properties but not the actual properties. That is, the Service would not own any of the islands (or portions of them) acquired for the expansion. This alternative is not preferred, because some species (i.e., colonial nesting waterbirds, Piping Plovers, eastern massasauga rattlesnakes) require habitat free from human disturbance. This alternative is also limiting, because some island property owners may not be interested in selling only certain property rights to the Service. They may only be interested in selling their properties outright. This alternative, then, eliminates the use of fee title purchase as a conservation tool, in which the Service actually owns the property. This alternative:

- Is likely to be less costly than Alternative 3, since only certain rights are purchased and not the entire property;

- May prove ineffective, since some landowners may be unwilling to sell only certain rights to their property; and
- Would not effectively meet the objective of this proposal by eliminating human disturbance to colonial nesting waterbirds, other species, and unique habitats.

### **Alternative 5 – Acquisition by a Combination of Fee Title and Less-Than-Fee Title (Service) as well as Acquisition and for Management by Others (State, County, Non-Governmental Organization, etc.) (Preferred Alternative)**

This alternative is essentially a combination of Alternatives 3 and 4 above. In this alternative, Green Bay and Michigan Islands NWRs would be expanded based on the priority list generated above through a combination of outright purchase of islands and through the purchase of certain rights to the island properties via conservation easements. In addition, other governmental and non-governmental partners would be encouraged to pursue similar conservation measures. **This alternative is preferred, because:**

- It is the most cost-effective approach to meeting the objective of this proposal; and
- Is also very adaptable, allowing for a variety of means to conserve island property, therefore allowing more options to work with island property owners.

Fee title acquisition would be preferred for acquiring all islands where colonial nesting waterbirds, Piping Plovers, and eastern massasauga rattlesnakes occur. Since human disturbance is a major threat to these species, fee title acquisition of a property that can be closed to public use, at least partially or seasonally, would provide the best protection. Less-than-fee title acquisition is preferred for all other island properties (tables C-2 and C-3). Important rights for the Service to consider when acquiring priority island property with the less-than-fee title option include: development (all types including roads), off-road vehicle use, party hunting, and use of herbicide or other appropriate tools to manage invasive species. Allowing or disallowing these activities is important to protecting the sensitive resources around which this proposal is built.

## **Acquisition Alternatives**

### **Purchase**

There are two different types of “purchase” that can be used to protect habitat. *Fee* purchase involves buying—as the availability of funding allows—a parcel of land outright from a willing seller in fee title, which involves all rights and complete ownership. *Easement* purchase refers to the purchase of limited rights (i.e., less-than-fee title) from an interested landowner. The landowner retains ownership of the land but sells certain rights identified and agreed upon by both parties. The objectives and conditions of proposed conservation easements recognize lands for their importance to wildlife habitat or outdoor recreational activities.

Funding to buy land comes primarily from the Land and Water Conservation Fund (LWCF), which derives from certain user fees, the proceeds from the disposal of surplus federal property, the federal tax on motor boat fuels, and oil and gas lease revenues. About 90 percent of that

fund now derives from Outer Continental Shelf oil and gas leases. The federal government receives about 40 percent of that fund to acquire and develop nationally significant conservation lands. Other sources of funding to purchase land include the Migratory Bird Conservation Fund, which derives from Federal Duck Stamp revenue, Environmental Protection Agency grants (albeit rare), and other funds geared for a specific use—of which one of the islands may fit. These funds, but primarily LWCF, will be used to acquire either full or partial interest in the priority islands listed above as opportunities in both land and funding arise.

## **Donation**

Generally, donations in the approved area as fee title or conservation easement are encouraged and welcomed as long as management concerns, such as contaminants, are not a major issue. Presently, there are no known opportunities to accept donations.

## **Exchange**

The Service has the authority to exchange land in Service ownership for other land that has greater habitat/wildlife value. Inherent in this concept is the requirement to get dollar-for-dollar value with, occasionally, an equalization payment. Exchanges are attractive, because they usually do not increase federal land holdings or require purchase funds; however, they also may be very labor and time intensive to complete. Presently, there are no known opportunities for exchange.

## **Transfer**

Transfer of military, USCG, and other lands declared excess to the Service is also acceptable. Poverty Island (one of the 63 priority islands) is currently in the process of being transferred to General Services Administration from the Bureau of Land Management and the USCG with plans for eventual transfer to the Service.

## **Coordination**

Coordination efforts for the proposed expansion have been somewhat limited given the scattered nature of the islands of concern and the vastness of the Great Lakes. However, the diverse ownership pattern on many of the islands lends itself to many potential partners once the expansion is approved. For example, many of the islands contain at least some state property, which opens the doors to coordinating with Wisconsin and Michigan state conservation agencies. The Bureau of Land Management, U. S. Coast Guard, and other agencies divest properties from time to time making them ideal for coordination, as has been the case in the past.

The Service coordinated with several agencies to gather data as input for the model used to prioritize islands for acquisition. TNC has been involved with island transfers and other island acquisitions in the past. Data from TNC's *Islands of Life* study was used as a basis for the model providing digitized islands as well as many attributes associated with them. The University of Minnesota contributed to the analysis for this proposal through the data collected from colonial nesting waterbird surveys. The UMR/GLRJV provided guidance for this proposal regarding focal colonial nesting waterbirds. Also, threatened and endangered species

information was provided through the Natural Heritage Inventory data from Wisconsin and Michigan.

And finally, there are several “islands” FWS Friends Groups who have rallied behind expansion of these two refuges and support the criteria used to prioritize islands for acquisition.

## **Sociocultural Impacts**

There are no anticipated negative sociocultural impacts associated with this proposal; however, there may be some positive impacts. Acquisition of the priority islands by the Service may prevent them from being developed. This may result in a slight improvement to public health (water quality) and safety (fewer roads, airports, congestion, etc.). Acquisition of the priority islands may also allow for some public use that currently does not exist due to private ownership. This may result in a slight increase in recreational opportunities for the general public. Public use opportunities will, however, be very situational given the sensitivity of the species and habitats on the islands that are being acquired. Furthermore, if any of the islands acquired contain cultural resources or heritage assets including archaeological sites, buildings and structures, landscapes, objects, and historic documents, they will be protected in perpetuity along with the rare species and habitats of concern.

## **Strategic Habitat Conservation**

This proposal has been developed with a Strategic Habitat Conservation framework:

### **Biological Planning**

Federal trust and other species and habitats of interest have been identified as well as population objectives for some focal species earlier in this document, including: Piping Plover, Hine’s emerald dragonfly (critical habitat), Pitcher’s thistle, Houghton’s goldenrod, dwarf lake iris, eastern massasauga rattlesnake, Common Tern, Forester’s Tern, Black-crowned Night-Heron, Black Tern, alvars, wetlands, and limestone plain forest complexes.

### **Conservation Design**

Islands within the approved study areas from the two PPPs were prioritized by determining species and habitats of interest. These species and habitats of interest formed the three criteria that were used to drive a model. This model, which included a ranking of islands considered a priority, produced an organized list of priority islands for future acquisition.

### **Conservation Delivery**

This planning process was used to determine the best approach (e.g., fee title, easement, partnership, etc.) to protect and restore essential habitat for the species of interest as well as other underrepresented and unique habitats through the possible expansion of two refuges.

### **Assumption-driven Research and Outcome-based Monitoring**

If this proposal is approved and the two refuges are expanded, management activities (or lack thereof in the case of disturbance being a big threat to colonial nesting waterbirds, etc.) and

their effect on the species and habitats of interest will be evaluated, so the assumptions made from the previous planning can be adapted and refined as necessary. “Lessons learned” will be shared and utilized for improvement of future management decisions.

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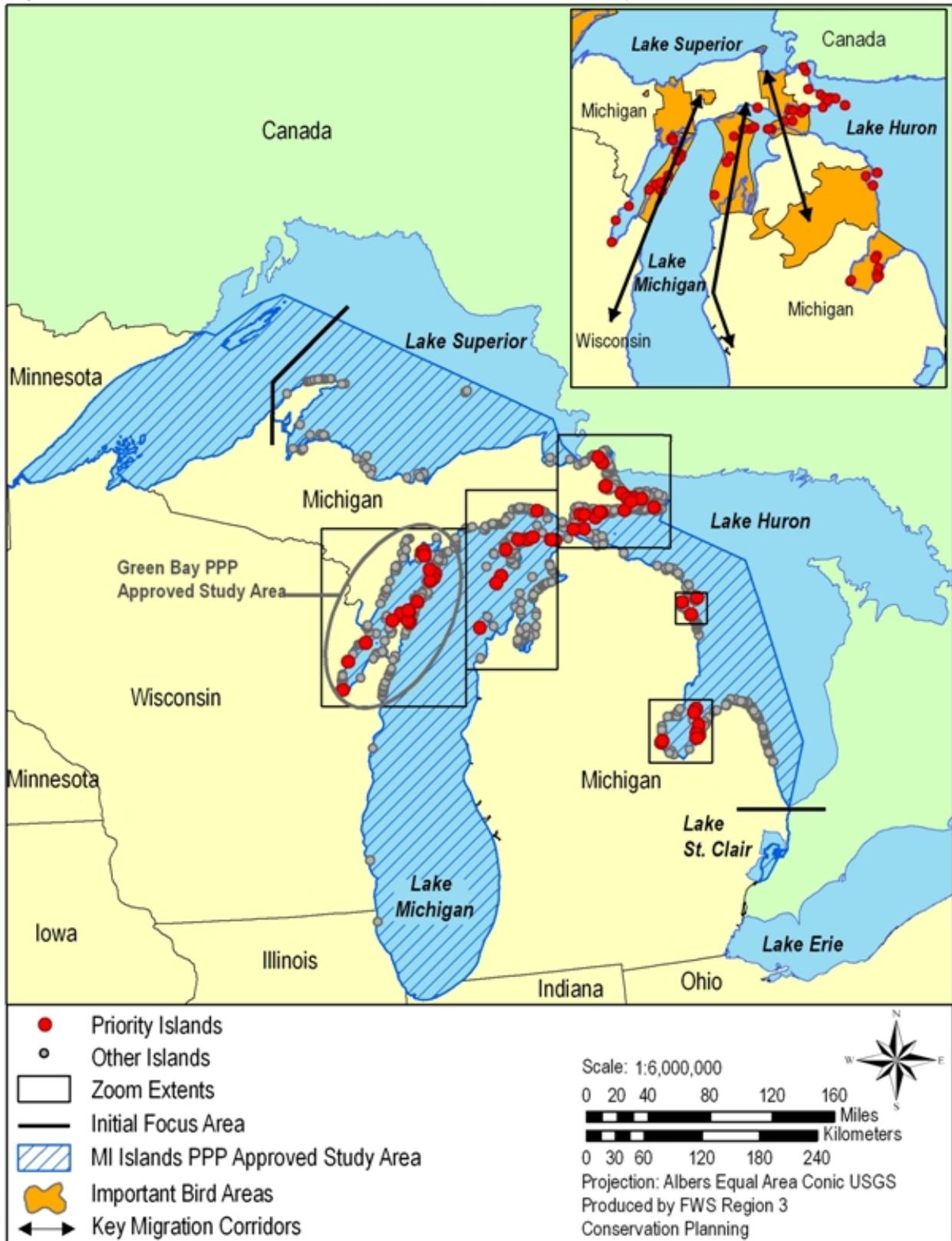
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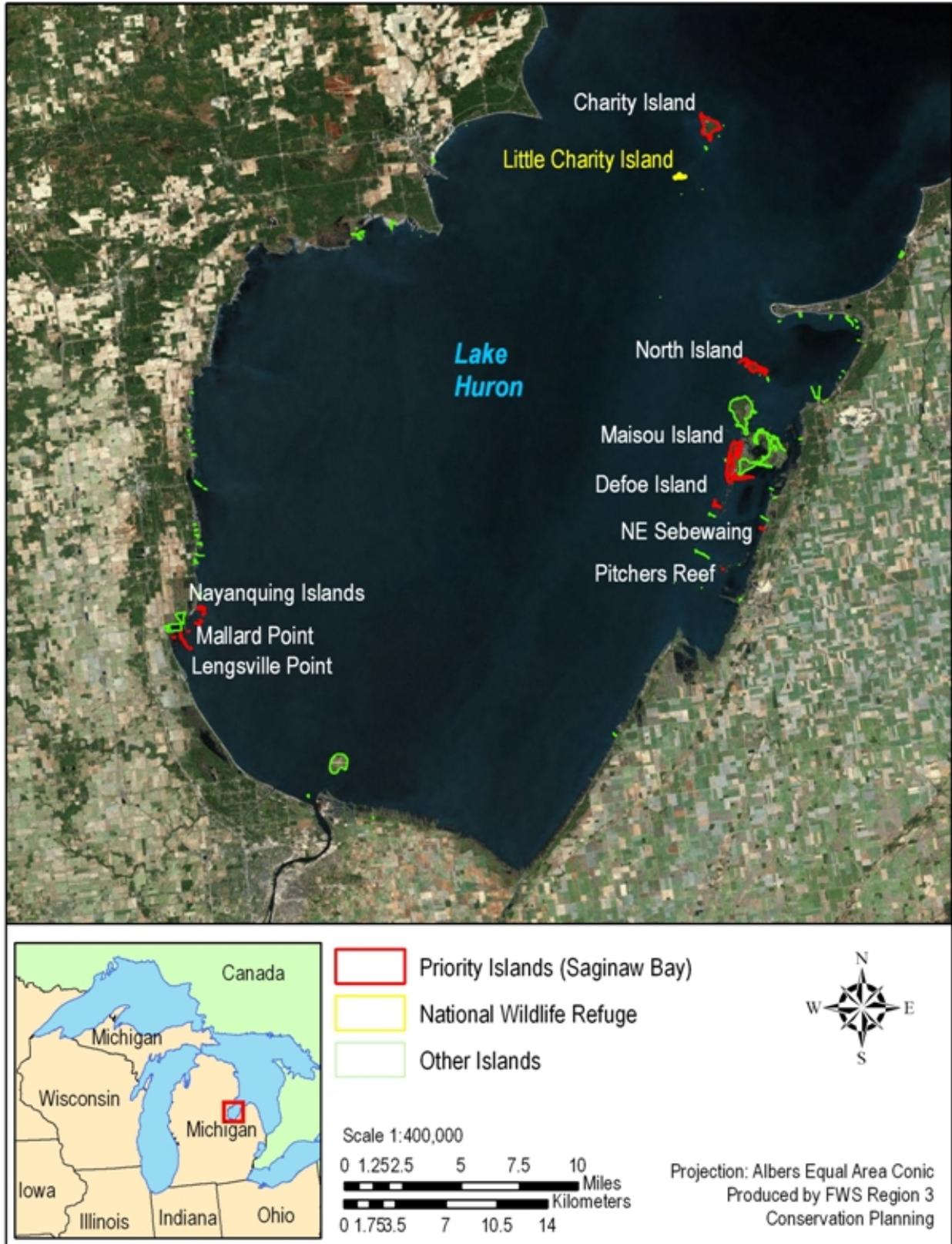
Wires, L. R., S. J. Lewis, G. J. Soulliere, S. W. Matteson, D. V. “Chip” Weseloh, R. P. Russell, and F. J. Cuthbert. 2010. *Upper Mississippi River/Great Lakes Region Waterbird Conservation Strategy. A plan associated with the Waterbird Conservation for the Americas Initiative. Final Report submitted to the U. S. Fish and Wildlife Service, Fort Snelling, MN.*

More detailed information on the sources for data used in this document and the spatial analysis completed can be found in the project file.

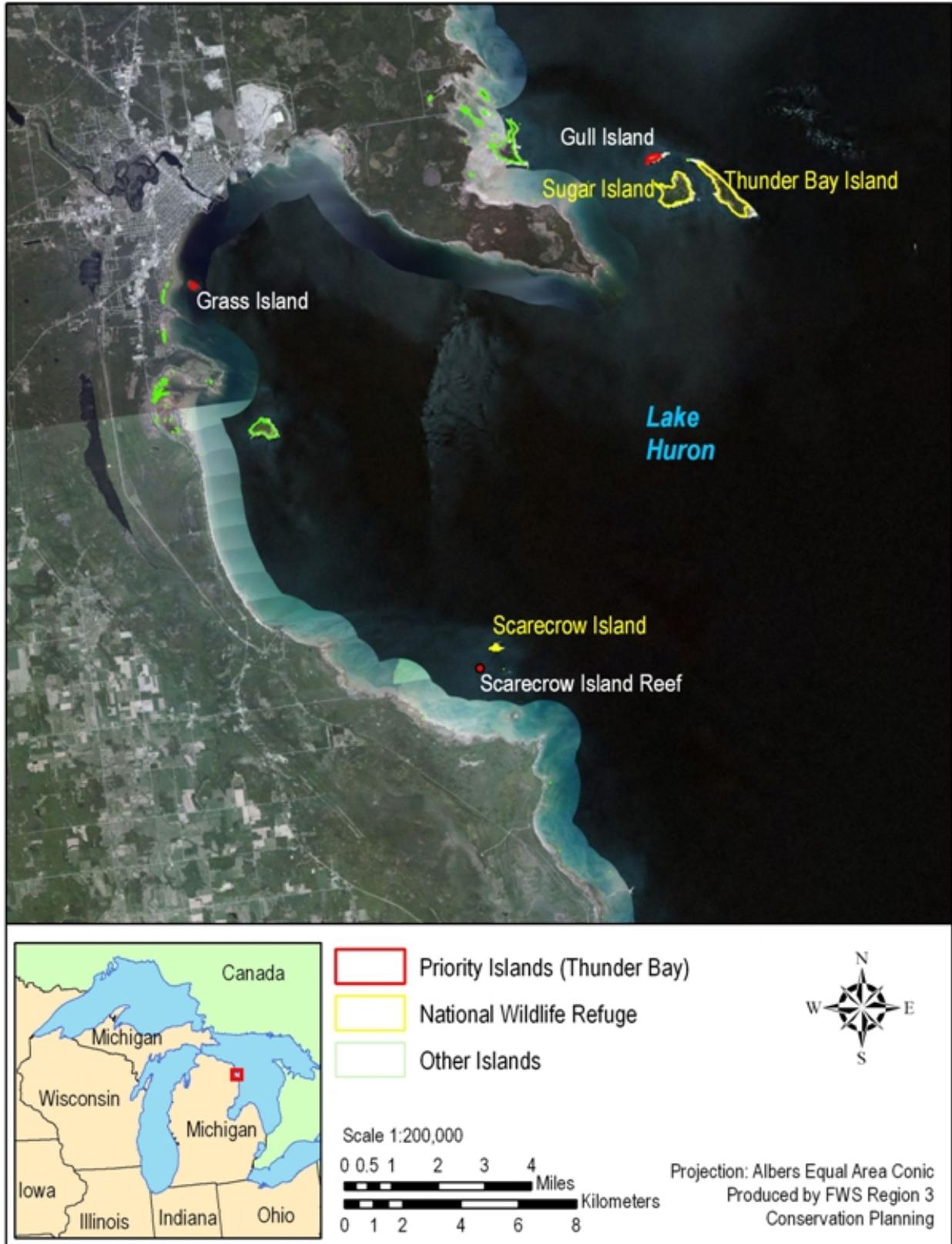
Figure C-1: Great Lakes Islands Expansion Approved Study Area



**Figure C-2: Priority islands for the expansion of Green Bay and Michigan Islands National Wildlife Refuges, Saginaw Bay Area**



**Figure C-3: Priority islands for the expansion of Green Bay and Michigan Islands National Wildlife Refuges, Thunder Bay Area**



**Figure C-4: Priority islands for the expansion of Green Bay and Michigan Islands National Wildlife Refuges, Green Bay Area**

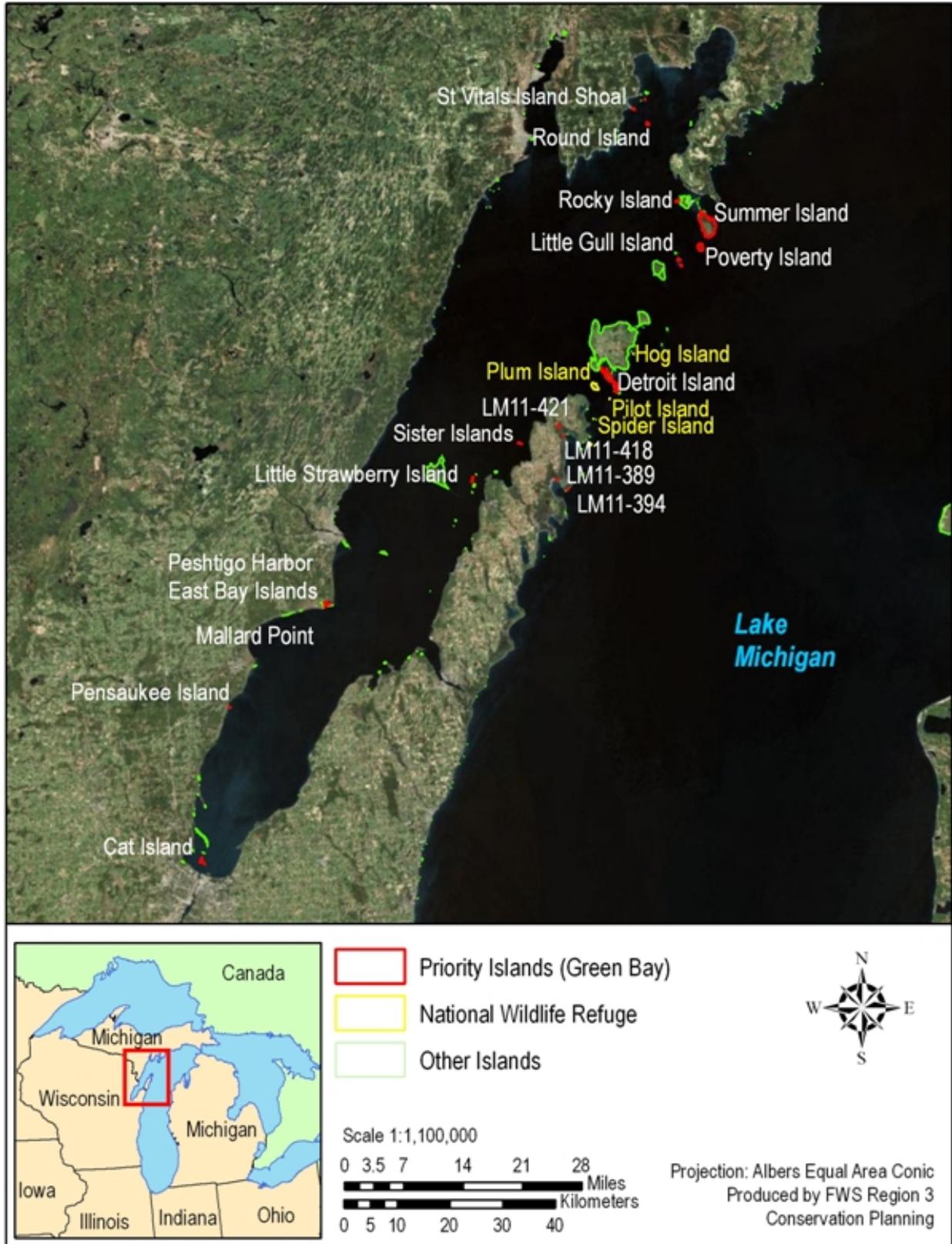
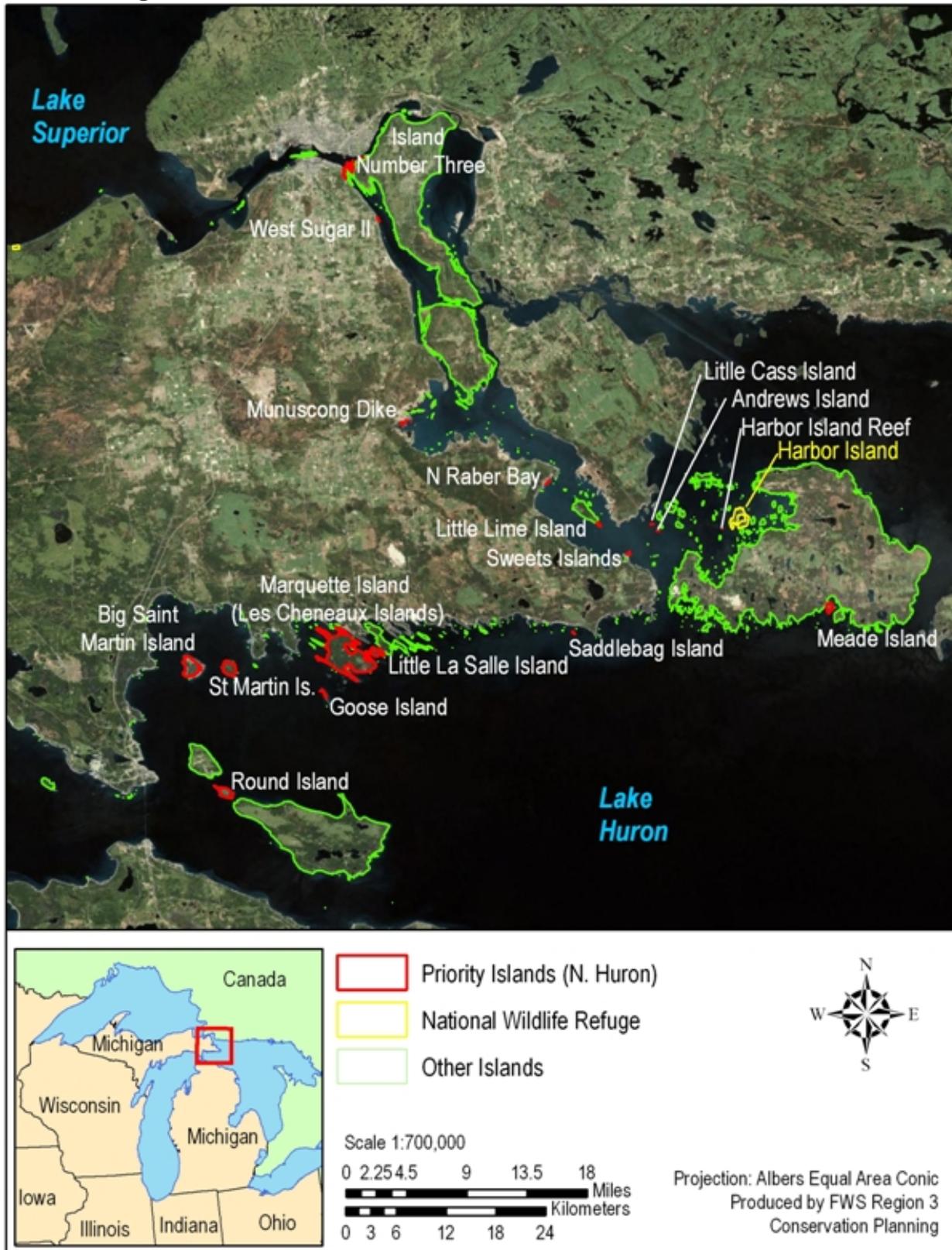
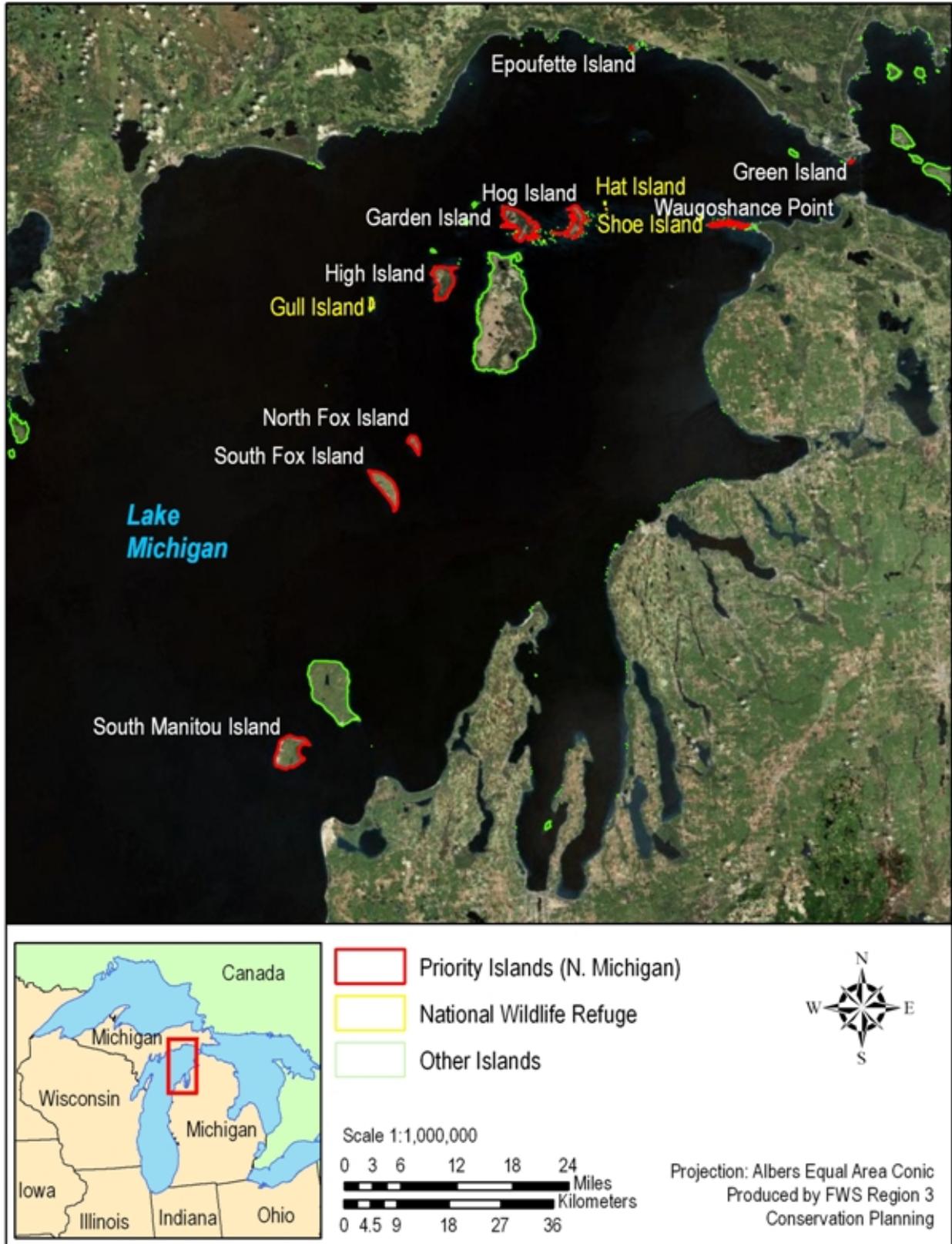


Figure C-5: Priority islands for the expansion of Green Bay and Michigan Islands National Wildlife Refuges, Northern Lake Huron Area



**Figure C-6: Priority islands for the expansion of Green Bay and Michigan Islands National Wildlife Refuges, Northern Lake Michigan Area**



**Table C-1: Birds of Conservation Concern (BCC) for Region 3 of the U.S. Fish and Wildlife Service that occur within Bird Conservation Regions (BCR) 12 and 23 and the project area**

American Ornithologists Union Code	Common Name	Scientific Name	Primary Habitat
HOGR	Horned Grebe	<i>Podiceps auritus</i>	Wetland
AMBI	American Bittern	<i>Botaurus lentiginosus</i>	Wetland
BAEA	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Lake
YERA	Yellow Rail	<i>Coturnicops noveboracensis</i>	Wetland
SOSA	Solitary Sandpiper	<i>Tringa solitaria</i>	Wetland
UPSA	Upland Sandpiper	<i>Bartramia longicauda</i>	Grassland
WHIM	Whimbrel	<i>Numenius phaeopus</i>	Wetland
REKN	Red Knot ( <i>rufa</i> )	<i>Calidris canutus rufa</i>	Wetland
BBSA	Buff-breasted Sandpiper	<i>Tryngites subruficollis</i>	Grassland
SBDO	Short-billed Dowitcher	<i>Limnodromus griseus</i>	Wetland
BBCU	Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	Shrub-Forest
SEOW	Short-eared Owl	<i>Asio flammeus</i>	Grassland
WPWI	Whip-poor-will	<i>Caprimulgus vociferus</i>	Shrub-Forest
OSFL	Olive-sided Flycatcher	<i>Contopus cooperi</i>	Wetland-Coniferous Forest
WOTH	Wood Thrush	<i>Hylocichla mustelina</i>	Deciduous Forest
GWWA	Golden-winged Warbler	<i>Vermivora chrysoptera</i>	Shrub-Wetland
CAWA	Canada Warbler	<i>Wilsonia canadensis</i>	Mixed Forest
NSTS	Nelson's Sparrow	<i>Ammodramus nelsoni</i>	Wetland-Grassland
SMLO	Smith's Longspur	<i>Calcarius pictus</i>	Grassland
RUBL	Rusty Blackbird	<i>Euphagus carolinus</i>	Wetland-Forest

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**Table C-2: Summary of the proposed action: Attributes used to determine and rank sixty-three priority islands for the expansion of Green Bay and Michigan Islands National Wildlife Refuges**

TNC Complex Number	TNC Complex Name	Houghton's Goldenrod	Dwarf Lake Iris	Pitcher's Thistle	Hine's Emerald Dragonfly	Hine's Emerald Dragonfly Critical Habitat	Piping Plover	Eastern Massasauga Rattlesnake	Key Ecological Systems (#)	Colonial Nesting Waterbird (AOU code)	Birds of Conservation Concern (AOU code)	Priority Rank
LM11-394		no	no	no	no	yes	no	no	2			1.4
LM11-418		no	no	no	no	yes	no	no	2			1.4
LM11-421		no	no	no	no	yes	no	no	2			1.4
LH5-1333	Charity Island	no	no	yes	no	no	no	yes	1	COTE	BAEA	1.4
LM12-1435	Hog Island	yes	yes	yes	no	no	no	no	2		BAEA	1.3
LH10-1323	Big Saint Martin Island	yes	yes	no	no	no	no	no	3		BAEA	1.3
LH10-1324	Saint Martin Island	yes	yes	no	no	no	no	no	3		BAEA	1.3
LM12-1436	Garden Island	yes	no	yes	no	no	no	no	3		BAEA	1.3
LH5-1337	Maisou Island	no	no	no	no	no	no	no	2	COTE	BAEA	1.2
LM9-274	Cat Island	no	no	no	no	no	no	no	1	COTE, BCNH		1.2
LM9-344	Peshtigo Harbor E. Bay	no	no	no	no	no	no	no	3	COTE		1.1
LM12-1438	Waugoshance Island	no	no	no	no	no	yes	no	2	COTE		1.1
LM13-1272	South Manitou Island	no	no	yes	no	no	no	no	2		BAEA	0.9
LM12-1443	High Island	no	no	yes	no	no	yes	no	1		BAEA	0.9
LM13-1270	South Fox Island	no	no	yes	no	no	yes	no	1		BAEA	0.9
LH10-719	Goose Island	no	no	no	no	no	no	no	2	BCNH		0.9
LH5-127	Lengsville Point	no	no	no	no	no	no	no	2	FOTE		0.9
LH5-128	Mallard Point	no	no	no	no	no	no	no	2	FOTE		0.9
LH5-129	Cattails E. of Pitchers Reef	no	no	no	no	no	no	no	2	FOTE		0.9
LH5-133	Nayanquing Offshore	no	no	no	no	no	no	no	2	FOTE		0.9
LH5-136	Northeast	no	no	no	no	no	no	no	2	FOTE		0.9

TNC Complex Number	TNC Complex Name	Houghton's Goldenrod	Dwarf Lake Iris	Pitcher's Thistle	Hine's Emerald Dragonfly	Hine's Emerald Dragonfly Critical Habitat	Piping Plover	Eastern Massasauga Rattlesnake	Key Ecological Systems (#)	Colonial Nesting Waterbird (AOU code)	Birds of Conservation Concern (AOU code)	Priority Rank
	Sebewaing											
LH5-142	Defoe Island	no	no	no	no	no	no	no	2	FOTE		0.9
LH9-773	Saddlebag Island	no	no	no	no	no	no	no	2	BCNH		0.9
LM12-942	Epoufette Island	no	no	no	no	no	no	no	2	BCNH		0.9
LS5-1014	North Raber Bay	no	no	no	no	no	no	no	2	BLTE		0.9
LS5-1076	West Sugar II	no	no	no	no	no	no	no	2	COTE		0.9
LS5-1090	Island Number Three	no	no	no	no	no	no	no	2	COTE		0.9
LS5-964	Little Lime Island	no	no	no	no	no	no	no	2	COTE		0.9
LS6-1037	North of Munuscong River	no	no	no	no	no	no	no	2	BLTE		0.9
LS6-1038	Munuscong Dike	no	no	no	no	no	no	no	2	BLTE		0.9
LS6-917	Sweets Islands	no	no	no	no	no	no	no	2	COTE		0.9
LH5-1334	North Island	no	no	no	no	no	no	yes	3			0.8
LM12-1437	Temperance Island	no	no	no	no	no	yes	no	3			0.8
LM10-606	Round Island	no	no	no	no	no	no	no	0	BCNH	BAEA	0.8
LH10-1322	Little La Salle Island	no	yes	yes	no	no	no	no	2			0.8
LH10-824	Pleasant Point	yes	yes	no	no	no	no	no	2			0.8
LM11-1461	Detroit Island	no	yes	no	no	no	no	no	1		BAEA	0.7
LM13-1269	North Fox Island	no	no	yes	no	no	no	no	1		BAEA	0.7
LM10-400	Little Strawberry Island	no	no	no	no	no	no	no	1	BCNH		0.7
LM10-416	Sister Islands	no	no	no	no	no	no	no	1	BCNH		0.7
LM9-308	Pensaukee Island	no	no	no	no	no	no	no	1	COTE		0.7
LH10-1439	Waugoshance Point	no	no	no	no	no	yes	no	2			0.6

TNC Complex Number	TNC Complex Name	Houghton's Goldenrod	Dwarf Lake Iris	Pitcher's Thistle	Hine's Emerald Dragonfly	Hine's Emerald Dragonfly Critical Habitat	Piping Plover	Eastern Massasauga Rattlesnake	Key Ecological Systems (#)	Colonial Nesting Waterbird (AOU code)	Birds of Conservation Concern (AOU code)	Priority Rank
LM11-1445	Summer Island	no	yes	no	no	no	no	no	2			0.6
LM11-389		no	yes	no	no	no	no	no	2			0.6
LM12-609		no	no	no	no	no	yes	no	2			0.6
GB6-939	Harbor Island Reef	no	no	no	no	no	no	no	0	COTE		0.5
GB6-944	Andrews Island	no	no	no	no	no	no	no	0	COTE		0.5
GB6-954	Little Cass Island	no	no	no	no	no	no	no	0	COTE		0.5
LH10-692	Green Island	no	no	no	no	no	no	no	0	BCNH		0.5
LH5-202	Charity Island	no	no	no	no	no	no	no	0	BCNH		0.5
LH6-326	Scarecrow Island	no	no	no	no	no	no	no	0	COTE		0.5
LH7-351	Grass Island	no	no	no	no	no	no	no	0	BCNH		0.5
LH7-358	Gull Island	no	no	no	no	no	no	no	0	BCNH		0.5
LM10-537	Rocky Island	no	no	no	no	no	no	no	0	BCNH		0.5
LM10-652	Shoal South of Martin Bay	no	no	no	no	no	no	no	0	COTE		0.5
LM10-673	St Vitals Island Shoal	no	no	no	no	no	no	no	0	COTE		0.5
LM11-501	Little Gull Island	no	no	no	no	no	no	no	0	BCNH		0.5
LM11-504	Gull Island	no	no	no	no	no	no	no	0	BCNH		0.5
LM12-675	Shoe Island	no	no	no	no	no	no	no	0	BCNH		0.5
LH8-1326	Round Island	no	yes	no	no	no	no	no	1			0.4
LM11-1446	Poverty Island	no	yes	no	no	no	no	no	1			0.4
LH9-1309	Meade Island	no	yes	no	no	no	no	no	0			0.2

**Table C-3: Summary of the proposed action: Other attributes of sixty-three priority islands for the expansion of Green Bay and Michigan Islands National Wildlife Refuges**

TNC Complex Number	TNC Complex Name	Acres	Houses per Acre (year 2000)	TNC Threat Score	Gov't Owned (%)	Private Owned (%)	NGO Owned (%)	Lighthouse	Elevation, from water surface (m)	Miles to Closest NWR	Type of Protection	Type of Acquisition	NWR to Expand
LH10-1316	Marquette Island	4,420	0.0	1	0	74	26	no	65	28	Less-Than-Fee Title	any	Michigan Islands
LM11-394		1	0.0	0	0	100	0	no	1	1	Less-Than-Fee Title	any	Green Bay
LM11-418		1	0.0	0	0	100	0	no	0	1	Less-Than-Fee Title	any	Green Bay
LM11-421		2	0.0	1	0	100	0	no	2	0	Less-Than-Fee Title	any	Green Bay
LH5-1333	Charity Island	267	0.0	0	77	11	11	yes	16	0	Fee Title	any	Michigan Islands
LM12-1435	Hog Island	2,272	0.0	0	100	0	0	no	36	1	Less-Than-Fee Title	any	Michigan Islands
LH10-1323	Big Saint Martin Island	822	0.0	2	0	100	0	no	34	33	Less-Than-Fee Title	any	Michigan Islands
LH10-1324	Saint Martin Island	505	0.0	0	0	100	0	no	31	36	Less-Than-Fee Title	any	Michigan Islands
LM12-1436	Garden Island	4,580	0.0	1	98	2	0	no	75	1	Less-Than-Fee Title	any	Michigan Islands
LH5-1337	Maisou Island	298	0.0	1	99	1	0	no	12	12	Fee Title	any	Michigan Islands
LM9-274	Cat Island	11	0.0	0	0	100	0	no	1	62	Fee Title	any	Green Bay
LM9-344	Peshtigo Harbor E. Bay	30	0.0	0	0	100	0	no	0	3	Fee Title	any	Green Bay
LM12-1438	Waugoshance Island	226	0.0	0	99	1	0	no	11	11	Fee Title	any	Michigan Islands
LM13-1272	South Manitou Island	5,308	0.4	15	68	32	0	yes	425	41	Less-Than-Fee Title	any	Michigan Islands
LM12-1443	High Island	3,587	0.0	1	100	0	0	no	238	7	Fee Title	any	Michigan Islands
LM13-1270	South Fox Island	3,434	0.0	0	35	65	0	yes	351	34	Fee Title	any	Michigan Islands
LH10-719	Goose Island	20	0.0	0	0	100	0	no	14	3	Fee Title	any	Michigan Islands
LH5-127	Lengsville Point	8	0.0	0	0	100	0	no	2	50	Fee Title	any	Michigan Islands
LH5-128	Mallard Point	1	0.0	0	0	100	0	no	2	50	Fee Title	any	Michigan Islands
LH5-129	Cattails E. of Pitchers	0	0.0	0	0	100	0	no	0	7	Fee Title	any	Michigan Islands

TNC Complex Number	TNC Complex Name	Acres	Houses per Acre (year 2000)	TNC Threat Score	Gov't Owned (%)	Private Owned (%)	NGO Owned (%)	Lighthouse	Elevation, from water surface (m)	Miles to Closest NWR	Type of Protection	Type of Acquisition	NWR to Expand
	Reef												
LH5-133	Nayanquing Offshore	7	0.0	0	0	100	0	no	1	55	Fee Title	any	Michigan Islands
LH5-136	Northeast Sebewaing	1	0.0	0	0	100	0	no	0	3	Fee Title	any	Michigan Islands
LH5-142	Defoe Island	11	0.0	0	96	4	0	no	6	41	Fee Title	any	Michigan Islands
LH9-773	Saddlebag Island	5	0.0	0	84	16	0	no	0	57	Fee Title	any	Michigan Islands
LM12-942	Epoufette Island	4	0.0	0	0	100	0	no	7	3	Fee Title	any	Michigan Islands
LS5-1014	North Raber Bay	1	0.0	0	19	81	0	no	0	3	Fee Title	any	Michigan Islands
LS5-1076	West Sugar II	5	0.0	0	0	100	0	no	4	11	Fee Title	any	Michigan Islands
LS5-1090	Island Number Three	60	0.0	1	0	99	1	no	17	1	Fee Title	any	Michigan Islands
LS5-964	Little Lime Island	15	0.0	0	99	1	0	no	11	28	Fee Title	any	Michigan Islands
LS6-1037	North of Munuscong River	0	0.0	0	0	100	0	no	0	36	Fee Title	any	Michigan Islands
LS6-1038	Munuscong Dike	8	0.0	0	88	12	0	no	0	5	Fee Title	any	Michigan Islands
LS6-917	Sweets Islands	3	0.0	0	0	100	0	no	2	35	Fee Title	any	Michigan Islands
LH5-1334	North Island	129	0.0	1	0	100	0	no	16	8	Fee Title	any	Michigan Islands
LM12-1437	Temperance Island	221	0.0	0	98	2	0	no	11	13	Fee Title	any	Michigan Islands
LM10-606	Round Island	34	0.0	0	0	100	0	no	9	14	Fee Title	any	Green Bay
LH10-1322	Little La Salle Island	273	0.0	1	0	61	39	no	21	28	Less-Than-Fee Title	any	Michigan Islands
LH10-824	Pleasant Point	1	0.0	2	0	100	0	no	1	35	Less-Than-Fee Title	any	Michigan Islands
LM11-1461	Detroit Island	639	0.3	17	0	100	0	no	82	27	Less-Than-Fee Title	any	Green Bay
LM13-1269	North Fox Island	832	0.0	0	100	0	0	no	168	35	Less-Than-Fee Title	any	Michigan Islands
LM10-400	Little Strawberry Island	15	0.0	0	0	100	0	no	12	3	Fee Title	any	Green Bay

TNC Complex Number	TNC Complex Name	Acres	Houses per Acre (year 2000)	TNC Threat Score	Gov't Owned (%)	Private Owned (%)	NGO Owned (%)	Lighthouse	Elevation, from water surface (m)	Miles to Closest NWR	Type of Protection	Type of Acquisition	NWR to Expand
LM10-416	Sister Islands	6	0.0	0	0	100	0	no	2	55	Fee Title	any	Green Bay
LM9-308	Pensaukee Island	4	0.0	0	0	100	0	no	0	1	Fee Title	any	Green Bay
LH10-1439	Waugoshance Point	240	0.0	0	99	1	0	no	4	14	Fee Title	any	Michigan Islands
LM11-1445	Summer Island	2,205	0.0	0	58	42	0	no	119	16	Less-Than-Fee Title	any	Green Bay
LM11-389		0	0.0	0	0	100	0	no	0	53	Less-Than-Fee Title	any	Green Bay
LM12-609		15	0.0	0	98	2	0	no	3	18	Fee Title	any	Michigan Islands
GB6-939	Harbor Island Reef	0	0.0	0	0	100	0	no	0	19	Fee Title	any	Michigan Islands
GB6-944	Andrews Island	0	0.0	0	0	100	0	no	1	10	Fee Title	any	Michigan Islands
GB6-954	Little Cass Island	1	0.0	0	0	100	0	no	2	11	Fee Title	any	Michigan Islands
LH10-692	Green Island	12	0.0	0	0	100	0	no	10	4	Fee Title	any	Michigan Islands
LH5-202	Charity Island	17	0.0	0	98	2	0	no	16	38	Fee Title	any	Michigan Islands
LH6-326	Scarecrow Island	0	0.0	0	0	100	0	no	0	9	Fee Title	any	Michigan Islands
LH7-351	Grass Island	5	0.0	0	0	100	0	no	1	11	Fee Title	any	Michigan Islands
LH7-358	Gull Island	15	0.0	0	0	100	0	no	10	23	Fee Title	any	Michigan Islands
LM10-537	Rocky Island	26	0.0	0	0	4	96	no	11	33	Fee Title	any	Green Bay
LM10-652	Shoal South of Martin Bay	0	0.0	0	0	100	0	no	0	30	Fee Title	any	Green Bay
LM10-673	St Vitals Island Shoal	0	0.0	0	0	100	0	no	0	30	Fee Title	any	Green Bay
LM11-501	Little Gull Island	10	0.0	0	0	100	0	no	13	8	Fee Title	any	Green Bay
LM11-504	Gull Island	20	0.0	0	0	100	0	no	12	10	Fee Title	any	Green Bay
LM12-675	Shoe Island	1	0.0	0	81	19	0	no	4	8	Fee Title	any	Michigan Islands
LH8-1326	Round Island	376	0.0	0	99	1	0	no	110	33	Less-Than-Fee Title	any	Michigan Islands
LM11-1446	Poverty Island	224	0.0	0	0	100	0	yes	53	35	Less-Than-Fee Title	any	Green Bay

TNC Complex Number	TNC Complex Name	Acres	Houses per Acre (year 2000)	TNC Threat Score	Gov't Owned (%)	Private Owned (%)	NGO Owned (%)	Lighthouse	Elevation, from water surface (m)	Miles to Closest NWR	Type of Protection	Type of Acquisition	NWR to Expand
LH9-1309	Meade Island	162	0.0	2	0	100	0	no	24	8	Less-Than-Fee Title	any	Michigan Islands

**Table C-4: Number of islands, acres, and privately owned acres for all Great Lakes islands (within the United States) within the Initial Focus Area^ as well as the priority islands**

	Number of Islands	Acres	Privately Owned (Acres)
<b>All Islands (Within the United States) in Initial Focus Area^</b>	1,093	282,820	93,502
<b>Priority Islands</b>	63	31,426	11,264

^See figure C-1.

**Table C-5: Major (and generally common) habitat types found on some of the priority islands for the expansion of Green Bay and Michigan Islands National Wildlife Refuges**

General Island Areas	Major Habitat Types										
	Temperate Broadleaf Forest	Broadleaf Deciduous Forest	Woody Wetlands	Coniferous Forest	Beaches	Shrub / Scrub	Grasslands	Sand Plain Mixed Forests	Limestone Plain Coniferous Forests	Emergent Herbaceous Wetlands	Rock
Green Bay area (Peshtigo Harbor East Bay Islands)	X		X		X	X					
Mackinac and Eastern Door County area (Garden, Hog, High, Waugoshance and Rock Islands)	X		X		X		X				
Manitou and Fox Islands area (South Manitou, North Fox and South Fox Islands)		X			X						
Lake Huron northern coast area (Saint Martin, Marquette, and Waugoshance Point Islands)			X					X	X		
Saginaw Bay area (Charity, North and Maisou Islands)		X	X				X			X	X
Lake Huron northwest coast area (Round Island)		X	X	X							

Attachment 1: Attributes for the seven largest and more highly developed islands as well as Shelter Island (environmental contaminant site) that are not considered a priority but would have acquisition considered on a case by case basis (see figure C-1).

TNC Complex Number	TNC Complex Name	Houghton's Goldenrod	Dwarf Lake Iris	Pitcher's Thistle	Hine's Emerald Dragonfly	Hine's Emerald Dragonfly Critical Habitat	Piping Plover	Eastern Massasauga Rattlesnake	Key Ecological Systems (#)	Colonial Nesting Waterbird (AOU code)	Birds of Conservation Concern (AOU code)
LS5-1410	Sugar Island	no	no	no	no	no	no	no	2	COTE	BAEA
LM13-1271	North Manitou Island	no	no	yes	no	no	yes	no	2		BAEA
LS5-1416	Neebish Island	no	no	no	no	no	no	no	3	COTE, BLTE	BAEA
LM12-1442	Beaver Island	yes	yes	yes	no	no	yes	no	2		AMBI, BAEA
LH8-1327	Bois Blanc Island	yes	yes	yes	yes	yes	no	yes	2		AMB, IBAEA
LM10-1459	Washington Island	no	yes	no	yes	yes	no	no	3		UPSA
GB6-1305	Drummond Island	no	yes	no	no	no	no	no	3	BLTE	AMBI, BAEA, YERA
LH5-1341	Shelter Island	no	no	no	no	no	no	no	0	COTE, BCNH	

TNC Complex Number	TNC Complex Name	Acres	Houses per Acre (year 2000)	TNC Threat Score	Gov't Owned (%)	Private Owned (%)	NGO Owned (%)	Lighthouse	Elevation, from water surface (m)	Miles to Closest NWR
LS5-1410	Sugar Island	31,574	1.9	572	0	90	10	no	322	25
LM13-1271	North Manitou Island	14,415	0.0	1	100	0	0	no	409	38
LS5-1416	Neebish Island	13,768	0.6	142	0	100	0	no	127	21
LM12-1442	Beaver Island	36,787	4.7	686	34	66	0	yes	215	3
LH8-1327	Bois Blanc Island	23,660	1.8	355	30	69	1	yes	112	34
LM10-1459	Washington Island	14,362	1.9	491	0	100	0	yes	175	27
GB6-1305	Drummond Island	83,258	2.2	730	55	44	2	no	184	1
LH5-1341	Shelter Island	292	0.0	0	0	100	0	no	29	18

Attachment 2: Attributes for all other islands within the Initial focus Area (see figure C-1).

TNC Complex Number	TNC Complex Name	Acres	Houses per Acre (year 2000)	TNC Threat Score	Gov't Owned (%)	Private Owned (%)	NGO Owned (%)	Lighthouse	Elevation, from water surface (m)	Miles to Closest NWR	Key Ecological Systems (#)	Birds of Conservation Concern (AOU code)
LH9-885	Adelaide Island	6	0.0	0	0	100	0	No	6	20	0	
LS5-1067	Advance Island	2	0.0	0	0	100	0	No	1	19	2	
LM10-399	Adventure Island	34	0.0	0	0	100	0	No	5	10	1	
LS11-1141	Agate Point	6	0.0	0	0	100	0	No	0	7	1	
GB6-950	Andrews Island	14	0.0	0	0	100	0	No	3	1	0	
GB6-1428	Ashman Island	62	0.0	0	0	100	0	No	7	2	1	
LH6-214	Au Gres Coastal Marsh	2	0.0	0	0	100	0	No	1	14	0	
LS9-1384	Au Train Island	102	0.0	0	0	100	0	No	33	36	0	BAEA
GB6-952	Bacon Island	4	0.0	0	0	100	0	No	4	4	1	
LH4-223	Bald Eagle Point	5	0.0	0	0	100	0	No	2	1	0	
GB6-1429	Bald Island	75	0.0	0	0	100	0	No	22	0	0	
LM9-725	Bass Islands	24	0.0	0	0	100	0	No	0	40	2	
LS5-1004	Bass Reef Island	1	0.0	0	0	100	0	No	1	17	2	
LM2-312	Basset Island	1	0.0	0	0	100	0	No	0	4	2	
GB6-940	Bay Island	3	0.0	0	0	100	0	No	1	3	0	
LS7-1077	Bay Mills Point	1	0.0	0	0	100	0	No	0	52	0	
LH10-834	Bear Island	1	0.0	0	0	100	0	No	0	13	2	
LM13-491	Beaver Archipelago	0	0.0	0	0	100	0	No	0	22	0	
LM13-492	Beaver Archipelago	0	0.0	0	0	100	0	No	0	16	1	
LM13-485	Beaver Archipelago	0	0.0	0	0	100	0	No	0	48	0	
LM13-481	Beaver Archipelago	0	0.0	0	0	100	0	No	0	52	1	
LH10-1315	Beaver Tail Point	42	0.0	3	0	100	0	No	3	20	2	
LS6-829	Bellevue Island	74	0.0	0	0	63	37	No	10	10	0	
LM2-376	Bellow Island	5	0.0	2	0	6	94	No	4	2	0	
LM10-464	Big Susie Island	17	0.2	3	0	100	0	No	1	16	1	
GB6-1431	Big Trout Island	96	0.0	0	0	100	0	No	19	4	1	
LH10-844	Birch Island	14	0.0	0	0	100	0	No	4	38	2	
LH10-1321	Boot Island	138	0.0	2	0	48	52	No	9	24	2	
LH9-794	Bootjack Island	8	0.0	0	0	100	0	No	3	28	2	
GB6-1432	Boulanger Island	48	0.0	0	0	100	0	No	16	0	0	
GB6-927	Bow Island	7	0.0	0	0	100	0	No	4	0	1	
LH10-880	Burnham Island	1	0.0	0	0	100	0	No	0	27	2	
LH4-237	Burnt Cabin Point	17	0.0	0	0	100	0	No	4	47	0	
GB6-1418	Burnt Island	433	0.0	0	0	100	0	No	17	3	2	BAEA
LH10-860	Bush Bay Island	0	0.0	0	0	100	0	No	0	19	2	
LM9-699	Butlers Island	8	0.0	0	0	100	0	No	0	65	0	
GB6-983	Butterfield Island	35	0.0	0	0	100	0	No	7	30	0	BAEA
GB6-1427	Cass Island	87	0.0	0	0	100	0	No	3	5	1	
GB6-1420	Cedar Island	69	0.0	0	0	100	0	No	7	1	1	BAEA

TNC Complex Number	TNC Complex Name	Acres	Houses per Acre (year 2000)	TNC Threat Score	Gov't Owned (%)	Private Owned (%)	NGO Owned (%)	Lighthouse	Elevation, from water surface (m)	Miles to Closest NWR	Key Ecological Systems (#)	Birds of Conservation Concern (AOU code)
LM10-1455	Chambers Island	2,820	0.7	55	0	100	0	Yes	18	29	3	BAEA
GB6-993	Cherry Island	2	0.0	0	0	100	0	No	3	1	1	
LH10-1318	Coryell Island	100	0.0	3	0	100	0	No	8	25	2	
LH9-875	Cove Island	2	0.0	0	0	100	0	No	0	14	0	
LH10-836	Cove Island	1	0.0	0	0	100	0	No	0	15	2	
LS6-817	Crab Island	5	0.0	0	0	100	0	No	0	58	0	
LH7-1329	Crooked Island	126	0.0	0	0	100	0	No	4	4	2	
LH10-820	Crow Island	3	0.0	0	0	100	0	No	3	19	2	
LS6-855	Small island in Whitney Bay	0	0.2	0	0	100	0	No	0	56	0	
LS6-866	Duck Island	21	0.5	6	0	100	0	No	7	25	1	
LH10-814	Eagle Island	5	0.0	0	0	100	0	No	0	32	2	
LS5-999	Edward Island	2	0.0	0	0	100	0	No	3	31	2	
LM12-923	Epoufette Island	6	0.0	0	0	100	0	No	2	17	0	
LH9-1313	Espanore Island	131	0.0	0	0	100	0	No	7	7	1	BAEA
GB6-884	Fairbank Island	2	0.0	0	0	100	0	No	1	3	0	
LM11-483	Fish Island	2	0.0	0	0	100	0	No	1	32	0	
LM1-427	Fisherman Island	11	0.0	0	58	42	0	No	3	9	1	
LM11-479	Fisherman Shoal	1	0.0	0	0	100	0	No	1	39	0	
LH4-229	Flat Rock Point	0	0.0	0	0	100	0	No	0	49	0	
LS6-865	Frying Pan Island	4	0.0	0	0	100	0	No	1	55	2	
LS6-1311	Garden Island	42	0.0	0	0	100	0	No	10	15	0	
LS9-1392	Garlic Island	6	0.0	0	0	100	0	No	0	27	0	
LS5-1078	Gem Island	2	0.0	0	0	100	0	No	0	19	2	
LH10-870	Goat Island	3	0.0	2	0	100	0	No	0	8	2	
LH10-1320	Government Island	224	0.0	0	0	100	0	No	11	26	2	
LS9-1382	Grand Island	13,563	0.4	12	100	0	0	Yes	120	19	3	BAEA
LS9-1386	Granite Island	5	0.0	0	0	100	0	No	0	27	0	
GB6-1430	Grape Island	83	0.0	0	0	100	0	No	13	1	1	
LH9-741	Gravel Island	23	0.0	0	0	100	0	No	4	9	1	BAEA
LM11-424	Gravel Island	1	0.0	0	0	100	0	No	0	50	2	
LM12-969	Gravel Island	1	0.0	0	0	100	0	No	0	2	0	
LM11-507	Gravelly Island	4	0.0	0	0	100	0	No	2	12	0	
LH10-779	Gravelly Island	8	0.0	0	0	100	0	No	4	18	2	
LM10-1454	Green Island	55	0.0	2	0	100	0	Yes	7	14	1	
LM13-1268	Gull Island	247	0.0	0	98	2	0	No	8	0	0	BAEA
GB6-924	Gull Island	18	0.0	0	0	100	0	No	7	1	0	
LH8-572	Gull Island	8	0.0	3	0	100	0	No	0	24	0	
LH5-109	Gull Island	3	0.0	0	0	100	0	No	0	12	2	

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LS6-1023	Gull Island	0	0.0	0	0	100	0	No	0	20	2	
LS10-1128	Gull Rock	0	0.0	0	0	100	0	Yes	1	30	0	
GB6-1000	Harris Island	23	0.0	0	0	100	0	No	5	3	0	
LS5-989	Hart Island	19	0.0	0	99	1	0	No	3	32	2	
LM12-684	Hat Island	15	0.0	0	93	7	0	No	2	24	0	
LM10-382	Hat Island	5	0.0	0	0	100	0	No	1	3	1	
LH10-873	Haven Island	1	0.0	0	0	100	0	No	0	24	2	
LH5-1335	Heisterman Island	570	0.0	0	99	1	0	No	5	10	4	BAEA
LS5-1057	Hen and Chicken Islands	32	0.0	0	0	100	0	No	0	31	2	
LM11-473	Hog Island	2	0.0	0	0	100	0	No	3	40	1	
LH10-838	Holsinger Island	0	0.0	0	0	100	0	No	1	16	2	
LM10-404	Horseshoe Island	30	0.0	0	0	100	0	No	9	3	1	
GB6-921	Howard Island	1	0.0	0	0	100	0	No	1	1	0	
LS10-1114	Huron NWR - Gull Island and Others	14	0.0	0	90	10	0	No	13	46	0	BAEA
LS10-1110	Huron NWR - Island off McIntyre Island	0	0.0	0	34	66	0	No	1	47	0	
LS10-1109	Huron NWR - Island off Lighthouse Island	0	0.0	0	0	100	0	No	0	47	0	
LS10-1108	Huron NWR - Islands next to Lighthouse Islands	10	0.0	0	72	28	0	No	25	1	0	BAEA
LS10-1113	Huron NWR - Lighthouse Island	44	0.0	1	86	14	0	Yes	44	43	0	
LS10-1112	Huron NWR - McIntyre Island	81	0.0	0	93	7	0	No	51	46	0	
LH10-816	Huron Point	2	0.0	0	0	100	0	No	0	3	2	
LS7-1088	Iroquois Island	6	0.0	0	0	100	0	No	2	6	0	
LS5-1086	Island Number Four	8	0.0	1	0	100	0	No	3	27	2	
LS5-1413	Island Number One (East)	69	0.0	1	0	100	0	No	4	37	2	
LS5-1415	Island Number One (West)	53	0.0	0	0	100	0	No	3	37	2	
LS5-1414	Island Number Two	60	0.0	0	0	100	0	No	4	37	2	
GB6-949	James Island	30	0.0	0	0	100	0	No	7	2	1	
GB6-951	Jim Island	1	0.0	0	0	100	0	No	1	1	0	
LS6-858	Jones Island	0	0.0	0	0	100	0	No	1	55	0	
LH10-1314	La Salle Island	1,037	0.0	1	0	100	0	No	23	27	2	
LS9-1390	Larus Island	2	0.0	0	0	100	0	No	11	58	0	
LH10-876	Avery Point Island	1	0.0	0	0	100	0	No	1	27	2	
LH10-868	Horse Rock Point	0	0.0	0	0	100	0	No	0	24	2	

TNC Complex Number	TNC Complex Name	Acres	Houses per Acre (year 2000)	TNC Threat Score	Gov't Owned (%)	Private Owned (%)	NGO Owned (%)	Lighthouse	Elevation, from water surface (m)	Miles to Closest NWR	Key Ecological Systems (#)	Birds of Conservation Concern (AOU code)
	Island											
LH10-770	Island south of Bosely Channel	1	0.0	0	0	100	0	No	0	2	2	
LH10-864	Island off of White Loon Island	0	0.0	0	0	100	0	No	2	19	2	
LS5-1421	Lime Island	908	0.0	1	99	1	0	No	33	10	2	BAEA
LH5-209	Little Charity Island	3	0.0	0	0	100	0	No	1	33	0	
LM12-959	Little Hog Island	3	0.0	0	0	100	0	No	2	25	0	
LM12-653	Little Island	14	0.0	0	99	1	0	No	3	6	0	
LH10-832	Little Island	3	0.0	0	0	100	0	No	2	37	2	
LS9-1391	Little Presque Isle	10	0.0	0	67	33	0	No	0	37	0	
LH10-749	Little Saint Martin Island	3	0.0	0	0	100	0	No	0	27	2	
LM10-1444	Little Summer Island	590	0.0	0	17	83	0	No	16	18	2	BAEA
GB6-938	Little Trout Island	8	0.0	0	0	100	0	No	4	8	0	
LH5-139	Lone Tree Island	5	0.0	0	94	6	0	No	2	46	2	
LH9-1310	Long Island	43	0.0	0	0	100	0	No	10	6	0	
GB6-977	Long Island	18	0.0	0	0	100	0	No	9	30	1	
LH10-1319	Long Island	70	0.0	3	0	100	0	No	4	32	2	
LM9-1451	Long Tail Point	79	0.0	0	0	100	0	Yes	0	65	1	BAEA
LS5-1001	Love Island	10	0.0	0	91	9	0	No	3	16	2	BAEA
LH10-1325	Mackinac Island	2,366	11.4	335	96	4	0	No	99	31	1	
GB6-1423	Macomb Island	232	0.0	0	0	100	0	No	25	4	1	
LH5-146	Maisou Island	1	0.0	0	67	33	0	No	2	2	2	
LS20-1267	Manitou Island	1,033	0.0	3	30	61	9	No	7	35	1	BAEA
GB6-1426	Maple Island	124	0.0	0	0	100	0	No	17	3	1	
LM2-1449	Marion Island	199	0.0	0	0	100	0	No	47	32	2	BAEA
LM9-379	Mekaunee Shoal	22	0.2	0	0	100	0	No	0	17	1	
LH5-1336	Middle Grounds Island - North	154	0.0	1	97	3	0	No	2	11	2	
LH5-1338	Middle Grounds Island - South	167	0.0	0	99	1	0	No	2	12	2	
LH7-1328	Middle Island	280	0.0	1	12	88	0	Yes	5	11	1	BAEA
LS9-1987	Middle Island	12	0.0	0	0	100	0	No	19	25	0	
LS6-1047	Moon Island	53	0.0	0	0	100	0	No	0	38	2	
LH10-882	Mortsen Point and Mill Pond Peninsula	2	0.0	0	0	100	0	No	2	27	2	
LS6-1044	Munuscong Island	26	0.0	0	0	100	0	No	0	36	2	
LS7-1087	Naomikong Island	0	0.0	0	0	100	0	No	1	54	0	
LM12-966	Naubinway Island	1	0.0	0	0	100	0	No	0	8	0	

TNC Complex Number	TNC Complex Name	Acres	Houses per Acre (year 2000)	TNC Threat Score	Gov't Owned (%)	Private Owned (%)	NGO Owned (%)	Lighthouse	Elevation, from water surface (m)	Miles to Closest NWR	Key Ecological Systems (#)	Birds of Conservation Concern (AOU code)
LH5-1339	Nayanquing Point	68	0.0	3	100	0	0	No	1	48	2	
GB6-1003	Norris Island	6	0.0	0	0	100	0	No	4	8	0	
LH4-224	Orion Rock	1	0.0	0	0	100	0	No	0	2	0	
LH4-213	Oscube Point	3	0.0	0	0	100	0	No	0	54	0	
LS9-1385	Partridge Island	93	0.0	0	0	100	0	No	67	38	0	BAEA
GB6-1422	Peck Island	54	0.0	0	0	100	0	No	13	2	0	BAEA
LH10-767	Penny Island	2	0.0	0	0	100	0	No	0	2	2	
LS10-1107	Pequaming Point	1	0.0	2	0	100	0	No	1	30	0	
LM9-1452	Peshtigo Harbor Peninsula	113	0.0	2	94	6	0	No	1	31	2	
LH9-808	Peters Island	6	0.0	0	0	100	0	No	1	19	2	
GB6-886	Picnic Island	7	0.0	0	0	100	0	No	4	3	0	
LS9-1393	Picnic Rocks	2	0.0	0	0	100	0	No	10	9	0	
LS6-1028	Pilot Island	1	0.0	0	0	100	0	No	0	60	2	
LS6-1027	Pine Island	4	0.0	1	0	100	0	No	3	7	2	
LS6-893	Pipe Island	15	0.0	0	0	100	0	No	5	24	2	
LS6-903	Pipe Island Twins	1	0.0	0	0	100	0	No	2	53	2	
LM10-403	Pirate Island	0	0.0	0	0	100	0	No	0	3	1	
LM12-626	Pismire Island	2	0.0	2	89	11	0	No	0	3	0	
LH5-134	Pitchers Reef	9	0.0	1	0	100	0	No	2	46	2	
LS11-1137	Porters Island	19	0.0	0	66	34	0	No	0	24	1	
LS9-1388	Presque Isle Point Rocks	2	0.0	0	0	100	0	No	0	14	0	
GB6-979	Propeller Island	1	0.0	0	0	100	0	No	1	2	0	
LM10-322	Quarry Point	7	0.0	0	0	100	0	No	1	12	1	
LM10-314	Rileys Point	22	0.0	3	0	100	0	No	5	27	1	
LM11-1463	Rock Island	975	0.0	2	97	3	0	Yes	65	26	2	BAEA
LS5-1071	Rock Island	2	0.0	2	0	100	0	No	2	18	2	
LH10-874	Roger Island	1	0.0	0	0	100	0	No	5	25	2	
GB6-932	Rogg Island	67	0.0	0	0	100	0	No	7	0	1	
LH7-372	Round Island	24	0.0	0	0	100	0	No	3	4	2	
LS5-1009	Round Island	9	0.0	0	0	100	0	Yes	10	40	2	
LS5-1081	Round Island	8	0.0	0	0	100	0	No	8	12	0	
LH10-828	Rover Island	18	0.0	0	0	100	0	No	3	30	2	
GB6-1424	Rultand Island	72	0.0	0	0	100	0	No	23	2	1	
LH10-1433	Saint Helena Island	288	0.0	0	0	5	95	Yes	7	0	0	BAEA
LH10-871	Saint Ledger Island	13	0.0	3	0	100	0	No	3	10	2	
LM10-1448	Saint Martin Island - Northwest	1,358	0.0	0	0	100	0	Yes	53	10	1	BAEA
LM10-681	Saint Vital Island	23	0.0	0	96	4	0	No	3	4	0	

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GB6-907	Sam Island	2	0.0	0	0	100	0	No	3	1	0	
LM9-602	Sand Island	30	0.0	3	0	100	0	Yes	1	21	0	
GB6-913	Seastone Point	2	0.0	3	0	100	0	No	3	3	1	
LS11-1125	Sevenmile Point	0	0.0	0	0	100	0	No	0	18	0	
LH1-1312	Shelter Island	67	0.0	0	0	100	0	No	3	12	0	
LH9-775	Silver Island	9	0.0	0	0	100	0	No	3	3	0	
LM10-318	Snake Island	23	0.0	0	0	100	0	No	1	46	2	
LM10-590	Snake Island	9	0.0	0	0	100	0	No	0	30	0	
LM10-466	Snake Island	1	0.0	0	0	100	0	No	0	2	1	
LM11-410	Spider Island	18	0.0	0	0	100	0	No	4	52	2	
LM12-1434	Squaw Island	75	0.0	0	0	100	0	Yes	7	8	1	
GB6-925	Squaw Island	1	0.0	0	0	100	0	No	1	3	0	
GB6-962	Staltonstall Island	22	0.0	0	0	100	0	No	5	2	1	
GB6-965	Standerson Island	24	0.0	0	0	100	0	No	2	2	0	
LS6-1033	Steamboat Island	1	0.0	0	0	100	0	No	0	59	2	
LH7-353	Stony Point	4	0.0	0	0	100	0	No	0	0	1	
LS6-830	Strawberry Island	5	0.0	0	0	100	0	No	1	58	2	
LH10-1317	Strong's Island	100	0.0	3	0	100	0	No	7	24	2	
LH7-1331	Sugar Island	192	0.0	0	0	100	0	No	6	0	1	BAEA
LH7-1332	Sulphur Island	82	0.0	2	0	100	0	No	3	6	0	BAEA
LS6-847	Surgeon Island	2	0.0	0	0	100	0	No	3	10	0	
GB6-914	Surveyors Island	10	0.0	0	0	100	0	No	9	0	0	
LS7-1096	Tahquamenon Island	2	0.0	2	0	100	0	No	1	54	0	
LS10-1381	Traverse Island	91	0.0	0	0	100	0	No	15	36	0	BAEA
LM12-1441	Trout Island	85	0.0	0	0	100	0	No	4	8	0	
LS5-1019	Twin Island	2	0.0	2	0	100	0	No	0	19	2	
GB6-984	Twin Sister Island	3	0.0	0	0	100	0	No	1	3	0	
LS5-1040	Two Tree Island	1	0.0	0	0	100	0	No	0	15	2	
LH10-747	Voight Bay Islands	2	0.0	0	0	100	0	No	0	20	2	
LM12-1440	Whisky Island	90	0.0	0	0	100	0	No	6	8	1	BAEA
LH10-862	White Loon Island	0	0.0	0	0	100	0	No	1	19	2	
LS9-1091	Williams Island	32	0.0	0	0	100	0	No	6	14	0	BAEA
GB6-891	Willoughby Island	3	0.0	0	0	100	0	No	1	2	0	
GB6-1419	Wilson Island	163	0.0	0	0	100	0	No	10	2	1	
LS9-1383	Wood Island	196	0.0	0	0	100	0	No	21	14	0	BAEA
GB6-919	Wreck Island	1	0.0	0	0	100	0	No	2	1	0	
GB6-883	Young Island	2	0.0	0	0	100	0	No	1	6	0	
LM9-341		2	0.0	0	0	100	0	No	0	17	1	YERA

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LH5-1340		108	0.0	1	100	0	0	No	3	21	2	
LS5-1411		81	0.0	1	0	100	0	No	11	33	0	
LM9-1450		70	0.0	0	0	100	0	No	3	65	2	
LS5-1093		47	0.0	2	0	100	0	No	10	24	0	
LM9-294		41	0.0	1	95	5	0	No	1	25	0	
LS5-1083		38	0.0	0	0	100	0	No	0	21	0	
LH9-784		34	0.0	2	0	100	0	No	7	31	0	
LS6-1045		29	0.0	0	0	100	0	No	0	38	2	
LM9-278		28	0.0	0	0	100	0	No	0	34	1	
LM9-273		27	0.0	0	0	100	0	No	0	14	1	
LS5-1059		25	0.0	0	0	100	0	No	0	38	2	
LS5-1085		25	0.0	1	0	100	0	No	3	25	2	
LS5-1098		19	0.0	0	0	100	0	No	0	26	2	
LH4-236		16	0.0	1	0	100	0	No	4	47	0	
LM10-320		15	1.5	9	0	100	0	No	2	25	1	
LH7-346		14	0.0	0	0	100	0	No	0	2	1	
LM9-328		14	0.0	0	0	100	0	No	2	7	0	
LS5-1062		13	0.0	0	0	100	0	No	0	17	2	
LS5-1051		12	0.0	0	0	100	0	No	0	39	2	
LH5-198		12	0.0	0	35	65	0	No	1	16	2	
LH10-856		12	0.0	0	0	14	86	No	3	8	2	
LH5-171		11	0.0	1	0	100	0	No	2	25	2	
LS6-1048		11	0.0	0	0	100	0	No	0	39	2	
LM9-339		10	0.0	0	0	100	0	No	1	15	1	
LH10-787		10	0.0	1	0	100	0	No	0	16	2	
LM9-282		10	0.0	0	0	100	0	No	0	8	1	
LH5-149		10	0.0	0	94	6	0	No	2	19	2	
LM9-563		10	0.0	0	57	43	0	No	1	68	3	
LH10-869		9	0.0	0	0	100	0	No	3	7	2	
LH5-147		8	0.0	0	0	100	0	No	1	33	2	
LM11-364		8	0.0	0	0	100	0	No	1	2	2	
LM9-285		8	0.0	0	0	100	0	No	0	25	1	
LH4-156		8	0.0	0	0	100	0	Yes	1	23	0	
LH10-901		8	0.0	0	50	50	0	No	0	8	2	
LM10-474		7	0.4	1	0	100	0	No	1	15	1	
LH4-168		7	0.2	0	0	100	0	No	0	60	0	
LS11-1138		6	0.0	0	0	100	0	No	10	16	1	
LS6-1041		6	0.0	0	0	100	0	No	0	58	2	
LH4-228		6	0.0	0	0	100	0	No	0	2	0	
LH1-720		6	0.0	0	0	100	0	No	1	0	0	
LH5-152		5	0.0	1	0	100	0	No	1	2	2	
LH5-153		5	0.0	0	0	100	0	No	2	3	2	
LH10-598		5	0.0	0	16	84	0	No	0	3	3	

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LH4-234		5	0.0	0	0	100	0	No	4	8	0	
GB6-998		5	0.0	0	0	100	0	No	1	21	1	
LH10-588		5	0.0	0	0	100	0	No	0	1	2	
LS5-1058		4	0.0	0	0	100	0	No	0	36	2	
LH9-735		4	0.0	0	0	100	0	No	0	6	0	
LH7-348		4	0.0	0	0	100	0	No	0	2	1	
LM12-948		4	0.0	0	0	100	0	No	2	36	1	
LH10-709		4	0.0	0	0	100	0	No	0	25	2	
LM12-630		4	0.0	1	0	100	0	No	0	1	0	
LH5-200		4	0.0	0	0	100	0	No	3	15	0	
LH5-175		4	0.0	0	0	100	0	No	2	24	2	
LH5-182		4	0.0	0	0	100	0	No	1	35	1	
LS5-1094		4	0.0	2	0	100	0	No	0	0	2	
LH4-231		4	0.0	0	0	100	0	No	1	49	0	
LH5-143		4	0.0	0	0	100	0	No	2	12	2	
LM11-433		4	0.0	0	0	100	0	No	1	43	1	
LS10-1104		4	0.0	0	0	100	0	No	0	11	1	
LM12-718		3	0.0	0	0	100	0	No	0	3	0	
LS5-1065		3	0.0	1	0	100	0	No	3	17	2	
LH9-758		3	0.0	0	0	100	0	No	0	36	0	
GB6-992		3	0.0	0	0	100	0	No	1	23	1	
LS5-1054		3	0.0	0	0	100	0	No	0	26	2	
LH4-113		3	0.0	0	0	100	0	No	1	7	0	
LS5-1053		3	0.0	0	0	100	0	No	0	31	2	
LM9-722		3	0.0	0	0	100	0	No	3	60	2	
LH5-137		3	0.0	0	0	100	0	No	2	46	2	
LM9-672		3	0.0	0	0	100	0	No	0	65	0	
LH4-174		3	0.0	0	0	100	0	No	0	60	0	
LH10-843		3	0.0	0	0	100	0	No	3	32	2	
LH4-203		3	0.0	0	0	100	0	No	0	1	0	
LS5-1079		2	0.0	2	0	100	0	No	0	20	2	
LM12-723		2	0.0	0	0	100	0	No	0	23	0	
LM11-381		2	0.0	0	0	100	0	No	0	55	2	
LH7-373		2	0.0	0	0	100	0	No	0	5	3	
LS11-1136		2	0.0	0	0	100	0	No	0	16	0	
LS5-1011		2	0.0	0	94	6	0	No	0	18	2	
LS6-1043		2	0.0	0	99	1	0	No	0	31	2	
LH5-158		2	0.0	0	0	100	0	No	2	23	2	
LM9-275		2	0.0	0	0	100	0	No	0	2	1	
LH10-712		2	0.0	0	0	100	0	No	0	5	2	
GB6-970		2	0.0	0	0	100	0	No	1	2	0	
LM9-277		2	0.0	0	0	100	0	No	0	2	1	

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LS11-1142		2	0.0	0	0	100	0	No	0	18	1	
LH5-161		2	0.0	0	0	100	0	No	0	20	2	
LH4-232		2	0.0	0	0	100	0	No	0	10	0	
LH10-822		2	0.0	0	0	100	0	No	0	3	2	
LH5-112		2	0.0	0	0	100	0	No	0	47	2	
LH5-118		2	0.2	0	0	100	0	No	0	14	2	
LM11-414		2	0.0	0	0	100	0	No	0	51	2	
LH5-151		2	0.0	0	81	19	0	No	0	30	2	
LM12-945		2	0.0	0	0	100	0	No	0	52	2	
LH10-693		2	0.0	0	0	100	0	No	0	2	1	
LS6-912		2	0.0	0	0	100	0	No	1	52	2	
LS5-1097		2	0.0	0	0	100	0	No	0	27	2	
LH8-460		1	0.0	0	0	100	0	No	0	29	0	
LS5-1082		1	0.0	0	0	100	0	No	0	20	0	
LH9-793		1	0.0	0	91	9	0	No	0	14	2	
LH7-360		1	0.0	0	0	100	0	No	0	5	1	
LS10-1105		1	0.0	1	0	100	0	No	0	7	1	
LS6-819		1	0.0	0	0	100	0	No	1	57	2	
LH9-748		1	0.0	0	0	100	0	No	1	11	1	
LH5-144		1	0.0	0	0	100	0	No	2	46	2	
LM9-287		1	0.0	0	0	100	0	No	0	8	1	
LH5-170		1	0.0	0	0	100	0	No	1	32	2	
LH7-342		1	0.0	0	0	100	0	No	1	10	1	
LM12-585		1	0.0	0	0	100	0	No	0	26	0	
LM10-456		1	0.0	3	0	100	0	No	1	11	1	
LS11-1134		1	0.0	0	0	100	0	No	0	15	0	
LH5-150		1	0.0	0	88	12	0	No	2	30	2	
GB6-1008		1	0.0	0	0	100	0	No	1	2	0	
LH9-755		1	0.0	0	0	100	0	No	0	24	0	
LH9-840		1	0.0	0	0	100	0	No	0	54	0	
LM10-705		1	0.0	0	0	100	0	No	1	32	0	
LM12-647		1	0.0	0	96	4	0	No	0	1	0	
LH10-888		1	0.0	0	0	100	0	No	1	7	3	
LS6-906		1	0.0	0	0	100	0	No	1	24	2	
LH4-131		1	0.0	0	0	100	0	No	1	38	0	
LH4-218		1	0.0	0	0	100	0	No	0	17	0	
LS5-1073		1	0.0	0	0	100	0	No	0	19	2	
LM11-506		1	0.0	0	0	100	0	No	0	12	0	
LH5-140		1	0.0	0	0	100	0	No	2	46	2	
LM2-319		1	0.0	0	4	96	0	No	0	1	2	
LS5-1063		1	0.0	1	0	100	0	No	3	17	2	

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LH7-366		1	0.0	0	0	100	0	No	0	4	1	
LM13-560		1	0.0	0	0	100	0	No	0	10	0	
LH5-148		1	0.0	0	81	19	0	No	2	3	2	
LM1-405		1	0.0	0	0	100	0	No	1	7	0	
LM1-406		1	0.0	0	0	100	0	No	0	35	0	
LM10-363		1	0.0	0	0	100	0	No	0	31	1	
LH5-172		1	0.0	0	0	100	0	No	2	33	2	
LM9-688		1	0.0	0	0	100	0	No	0	18	0	
LH4-201		1	0.0	0	0	100	0	No	0	1	0	
LH5-135		1	0.0	0	0	100	0	No	0	33	2	
LM12-522		1	0.0	0	95	5	0	No	0	1	0	
LH5-173		1	0.0	0	0	100	0	No	2	31	2	
LH5-154		1	0.0	0	0	100	0	No	1	24	2	
LH5-159		1	0.0	0	0	100	0	No	0	26	2	
LH7-383		1	0.0	0	0	100	0	No	0	6	0	
LM11-511		1	0.0	0	0	100	0	No	0	5	1	
GB6-972		1	0.0	0	76	24	0	No	1	28	1	
LS5-1070		1	0.0	0	0	100	0	No	0	18	2	
LM10-541		1	0.0	0	0	100	0	No	0	3	0	
LS5-1095		1	0.0	3	0	100	0	No	0	2	2	
LS11-1143		1	0.0	0	0	100	0	No	0	13	0	
LS11-1135		1	0.0	0	0	100	0	No	0	18	0	
LS5-1072		1	0.0	0	0	100	0	No	0	19	2	
LH10-867		1	0.0	0	0	100	0	No	2	21	2	
LM9-290		1	0.0	0	0	100	0	No	0	8	0	
LH5-104		1	0.0	0	0	100	0	No	2	14	2	
LH4-123		1	0.0	0	0	100	0	No	1	37	0	
LS6-1020		1	0.0	0	0	100	0	No	0	4	2	
LS5-1069		1	0.0	0	0	100	0	No	0	18	2	
LS5-1017		1	0.0	0	0	100	0	No	0	19	2	
LM11-594		1	0.0	0	0	100	0	No	1	6	0	
LS5-1060		1	0.0	0	0	100	0	No	0	17	2	
LM10-370		1	0.0	0	0	100	0	No	0	12	1	
LM9-340		1	0.0	0	0	100	0	No	0	16	1	
LS11-1133		0	0.0	0	0	100	0	No	0	18	0	
LS5-1089		0	0.0	0	0	100	0	No	0	2	0	
LH5-165		0	0.0	0	0	100	0	No	2	22	2	
LH4-177		0	0.0	0	0	100	0	No	0	25	0	
LM12-941		0	0.0	0	0	100	0	No	0	10	0	
LH4-233		0	0.0	0	0	100	0	No	4	9	0	
LH9-771		0	0.0	0	0	100	0	No	1	2	0	

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LS5-1056		0	0.0	0	0	100	0	No	0	17	2	
LH4-183		0	0.0	0	0	100	0	No	0	36	0	
LH9-756		0	0.0	0	0	100	0	No	1	24	0	
LH7-338		0	0.0	0	0	100	0	No	1	3	0	
LS6-1046		0	0.0	0	70	30	0	No	0	33	2	
LS11-1146		0	0.0	0	0	100	0	No	0	17	0	
LS5-1015		0	0.0	0	0	100	0	No	0	18	2	
LM10-324		0	0.0	0	0	100	0	No	0	33	1	
GB6-994		0	0.0	0	0	100	0	No	1	29	1	
LH8-591		0	0.0	0	0	100	0	No	0	25	0	
LM10-310		0	0.0	0	0	100	0	No	0	5	1	
GB6-929		0	0.0	0	0	100	0	No	0	0	1	
LM9-711		0	0.0	0	0	100	0	No	0	15	0	
LS11-1140		0	0.0	0	0	100	0	No	0	17	1	
LH4-187		0	0.0	0	0	100	0	No	0	17	0	
LH5-157		0	0.0	0	0	100	0	No	2	20	2	
GB6-971		0	0.0	0	0	100	0	No	1	1	0	
LM11-411		0	0.0	0	0	100	0	No	0	51	2	
LH7-357		0	0.0	0	0	100	0	No	0	4	0	
LS5-1092		0	0.0	3	0	100	0	No	0	1	2	
LS5-1055		0	0.0	0	0	100	0	No	0	17	2	
LM9-279		0	0.0	0	0	100	0	No	0	37	1	
LS10-1106		0	0.0	1	0	100	0	No	0	29	1	
LS6-1021		0	0.0	0	0	100	0	No	0	2	2	
LS5-1084		0	0.0	0	0	100	0	No	2	20	2	
LH4-181		0	0.0	0	0	100	0	No	0	21	0	
LS5-1049		0	0.0	0	0	100	0	No	0	18	2	
LS5-1061		0	0.0	0	0	100	0	No	0	17	2	
LH7-345		0	0.0	0	0	100	0	No	0	4	0	
LS11-1132		0	0.0	0	0	100	0	No	0	18	1	
LH7-365		0	0.0	0	0	100	0	No	0	5	1	
LH7-402		0	0.0	0	0	100	0	No	0	5	0	
LS5-1052		0	0.0	0	0	100	0	No	0	18	3	
LS11-1147		0	0.0	0	0	100	0	No	0	17	1	
LM11-455		0	0.0	2	0	100	0	No	0	43	1	
LH10-825		0	0.0	2	0	100	0	No	0	14	2	
LH10-908		0	0.0	0	0	100	0	No	0	7	2	
LH4-185		0	0.0	0	0	100	0	No	0	14	0	
LH8-446		0	0.0	0	0	100	0	No	0	31	0	

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LH5-163		0	0.0	0	0	100	0	No	2	19	2	
LM10-582		0	0.0	0	0	100	0	No	0	24	1	
LH9-781		0	0.0	0	0	100	0	No	0	22	2	
LS5-1074		0	0.0	0	0	100	0	No	0	38	2	
LH4-217		0	0.0	0	0	100	0	Yes	2	14	0	
LM12-659		0	0.0	0	94	6	0	No	0	35	0	
LM10-391		0	0.0	0	0	100	0	No	0	3	1	
LH10-877		0	0.0	0	0	100	0	No	0	26	2	
LS5-1080		0	0.0	0	0	100	0	No	0	20	2	
LH5-164		0	0.0	0	0	100	0	No	0	28	2	
LS5-1064		0	0.0	0	0	100	0	No	0	17	2	
LH5-155		0	0.0	0	0	100	0	No	1	37	2	
LM11-509		0	0.0	0	0	100	0	No	0	1	0	
LH4-141		0	0.0	0	0	100	0	No	0	34	0	
LS11-1144		0	0.0	0	0	100	0	No	0	16	0	
LS5-1075		0	0.0	2	0	100	0	No	0	21	2	
LM7-64		0	0.0	0	0	100	0	No	0	0	0	
GB6-1002		0	0.0	0	0	100	0	No	0	8	1	
GB6-987		0	0.0	0	0	100	0	No	0	1	0	
LH5-132		0	0.0	0	0	100	0	No	0	32	2	
LH7-367		0	0.0	0	0	100	0	No	0	8	0	
LS11-1139		0	0.0	0	0	100	0	No	0	18	1	
LM9-283		0	0.0	0	0	100	0	No	0	7	1	
LS5-1066		0	0.0	0	0	100	0	No	2	18	2	
LM11-428		0	0.0	0	0	100	0	No	0	48	2	
LS9-1389		0	0.0	0	0	100	0	No	0	20	0	
LS10-1111		0	0.0	0	0	100	0	No	0	31	0	
LH8-465		0	0.0	0	0	100	0	No	0	30	1	
LH4-190		0	0.0	0	0	100	0	No	0	52	0	
LS5-1068		0	0.0	0	0	100	0	No	0	18	2	
LH6-321		0	0.0	0	0	100	0	No	0	6	1	
LH4-191		0	0.0	0	0	100	0	No	0	50	0	
LM11-450		0	0.0	0	0	100	0	No	0	32	1	
LM12-624		0	0.0	0	0	100	0	No	0	11	0	
LM12-564		0	0.0	0	0	100	0	No	0	4	0	
LM12-656		0	0.0	0	0	100	0	No	0	6	0	
LM12-573		0	0.0	0	0	100	0	No	0	7	0	
LM12-567		0	0.0	0	0	100	0	No	0	13	1	
LM12-674		0	0.0	0	0	100	0	No	0	31	1	
LM12-635		0	0.0	0	0	100	0	No	0	2	0	
LM12-596		0	0.0	0	0	100	0	No	0	28	2	

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LM12-570		0	0.0	0	0	100	0	No	0	1	0	
LM10-528		0	0.0	0	0	100	0	No	0	7	0	
LM11-526		0	0.0	0	0	100	0	No	0	18	0	
LM2-327		0	0.0	0	0	100	0	No	0	17	2	
LM11-269		0	0.0	0	0	100	0	No	0	6	0	
LS5-1022		0	0.0	0	0	100	0	No	0	7	2	
LM12-973		0	0.0	0	0	100	0	No	0	35	0	
LM12-934		0	0.0	0	0	100	0	No	0	34	0	
LM12-918		0	0.0	0	0	100	0	No	0	32	0	
LM12-831		0	0.0	0	0	100	0	No	0	2	0	
LM11-697		0	0.0	0	0	100	0	No	0	8	0	
LM12-682		0	0.0	0	0	100	0	No	0	18	0	
LM12-645		0	0.0	0	0	100	0	No	0	3	1	
LM12-639		0	0.0	0	0	100	0	No	0	3	0	
LM12-610		0	0.0	0	0	100	0	No	0	0	2	
LM11-605		0	0.0	0	0	100	0	No	0	32	0	
LM12-583		0	0.0	0	0	100	0	No	0	4	0	
LM12-581		0	0.0	0	0	100	0	No	0	3	0	
LM12-578		0	0.0	0	0	100	0	No	0	3	0	
LM12-576		0	0.0	0	0	100	0	No	0	3	0	
LM12-558		0	0.0	0	0	100	0	No	0	12	0	
LM10-531		0	0.0	0	0	100	0	No	0	7	0	
LM11-525		0	0.0	0	0	100	0	No	0	29	0	
LM11-523		0	0.0	0	0	100	0	No	0	22	0	
LM11-521		0	0.0	0	0	100	0	No	0	24	0	
LM1-497		0	0.0	0	0	100	0	No	0	7	0	
LM11-490		0	0.0	0	0	100	0	No	0	18	1	
LM11-486		0	0.0	0	0	100	0	No	0	0	1	
LM1-469		0	0.0	0	0	100	0	No	0	3	0	
LM11-458		0	0.0	2	0	100	0	No	0	19	1	
LM11-452		0	0.0	2	0	100	0	No	0	11	1	
LM11-451		0	0.0	0	0	100	0	No	0	5	1	
LM1-432		0	0.0	0	0	100	0	No	0	15	0	
LM11-440		0	0.0	0	0	100	0	No	0	11	1	
LM1-407		0	0.0	0	0	100	0	No	0	26	0	
LM11-408		0	0.0	0	0	100	0	No	0	16	2	
LM2-334		0	0.0	0	0	100	0	No	0	32	2	
LS20-1120		0	0.0	0	0	100	0	No	0	11	0	
LS20-1119		0	0.0	0	0	100	0	No	0	24	0	
LS5-1042		0	0.0	0	0	100	0	No	0	29	2	
LS6-1039		0	0.0	0	0	100	0	No	0	21	2	
LS5-1036		0	0.0	0	0	100	0	No	0	11	2	

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LS6-1035		0	0.0	0	0	100	0	No	0	58	2	
LS5-1032		0	0.0	0	0	100	0	No	0	17	2	
LS5-1034		0	0.0	0	0	100	0	No	0	10	2	
LS6-1031		0	0.0	0	0	100	0	No	0	47	2	
LS6-1024		0	0.0	0	0	100	0	No	0	19	2	
LS6-1030		0	0.0	0	0	100	0	No	0	88	2	
LS6-1029		0	0.0	0	0	100	0	No	0	16	2	
LS5-1025		0	0.0	0	0	100	0	No	0	6	2	
LS5-1026		0	0.0	0	0	100	0	No	0	10	2	
LS5-1018		0	0.0	0	0	100	0	No	0	7	2	
LS5-1016		0	0.0	0	0	100	0	No	0	8	2	
LS5-1013		0	0.0	0	0	100	0	No	0	6	2	
GB6-1010		0	0.0	0	0	100	0	No	0	35	0	
LS5-1012		0	0.0	0	0	100	0	No	0	10	2	
GB6-1007		0	0.0	0	0	100	0	No	0	6	0	
LS5-1005		0	0.0	0	0	100	0	No	0	16	2	
LM12-991		0	0.0	0	0	100	0	No	0	14	0	
LM12-988		0	0.0	0	0	100	0	No	0	11	0	
GB6-1006		0	0.0	0	0	100	0	No	0	34	0	
LS5-997		0	0.0	0	0	100	0	No	0	12	2	
GB6-995		0	0.0	0	0	100	0	No	0	0	1	
LM12-990		0	0.0	0	0	100	0	No	0	11	0	
LM12-982		0	0.0	0	0	100	0	No	0	35	0	
LM12-985		0	0.0	0	0	100	0	No	0	11	0	
LM12-978		0	0.0	0	0	100	0	No	0	35	0	
GB6-996		0	0.0	0	0	100	0	No	0	11	1	
LM12-981		0	0.0	0	0	100	0	No	0	35	0	
LM12-975		0	0.0	0	0	100	0	No	0	35	0	
GB6-974		0	0.0	0	0	100	0	No	0	23	0	
GB6-986		0	0.0	0	0	100	0	No	0	37	0	
LM12-980		0	0.0	0	0	100	0	No	0	35	0	
LS5-976		0	0.0	0	0	100	0	No	0	10	2	
LM12-968		0	0.0	0	0	100	0	No	0	35	0	
LM12-961		0	0.0	0	0	100	0	No	0	35	0	
LM12-967		0	0.0	0	0	100	0	No	0	35	0	
GB6-963		0	0.0	0	0	100	0	No	0	36	0	
GB6-957		0	0.0	0	0	100	0	No	0	41	0	
GB6-960		0	0.0	0	0	100	0	No	0	39	0	
GB6-958		0	0.0	0	0	100	0	No	0	39	0	
GB6-956		0	0.0	0	0	100	0	No	0	38	0	
GB6-953		0	0.0	0	0	100	0	No	0	42	0	
GB6-955		0	0.0	0	0	100	0	No	0	39	0	
GB6-947		0	0.0	0	0	100	0	No	0	37	1	
LM12-946		0	0.0	0	0	100	0	No	0	35	0	

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LM12-943		0	0.0	0	0	100	0	No	0	36	1	
LM12-933		0	0.0	0	0	100	0	No	0	67	0	
LM12-936		0	0.0	0	0	100	0	No	0	36	1	
LS6-926		0	0.0	0	0	100	0	No	0	0	2	
LM12-922		0	0.0	0	0	100	0	No	0	38	0	
GB6-931		0	0.0	3	0	100	0	No	0	34	0	
LH10-915		0	0.0	0	0	100	0	No	0	31	2	
LH10-928		0	0.0	0	0	100	0	No	0	31	2	
LM12-935		0	0.0	0	0	100	0	No	0	35	0	
GB6-930		0	0.0	0	0	100	0	No	0	34	0	
GB6-909		0	0.0	0	0	100	0	No	0	28	0	
GB6-937		0	0.0	0	0	100	0	No	0	38	0	
LH10-920		0	0.0	0	0	100	0	No	0	31	2	
GB6-910		0	0.0	0	0	100	0	No	0	25	0	
LS6-905		0	0.0	0	0	100	0	No	0	0	2	
LM12-902		0	0.0	0	0	100	0	No	0	26	0	
GB6-911		0	0.0	0	0	100	0	No	0	29	0	
LM12-898		0	0.0	0	0	100	0	No	0	26	0	
GB6-916		0	0.0	0	0	100	0	No	0	27	0	
LH10-900		0	0.0	0	0	100	0	No	0	32	2	
GB6-904		0	0.0	0	0	100	0	No	0	23	0	
LH10-896		0	0.0	0	0	100	0	No	0	31	2	
LH10-897		0	0.0	0	0	100	0	No	0	32	2	
GB6-890		0	0.0	0	0	100	0	No	0	3	0	
LM12-895		0	0.0	0	0	100	0	No	0	0	0	
LH10-899		0	0.0	0	0	100	0	No	0	32	2	
LM12-894		0	0.0	0	0	100	0	No	0	3	0	
GB6-889		0	0.0	0	0	100	0	No	0	21	0	
GB6-892		0	0.0	0	0	100	0	No	0	1	0	
LH10-881		0	0.0	0	0	100	0	No	0	32	2	
GB6-887		0	0.0	0	0	100	0	No	0	19	0	
LH9-878		0	0.0	0	0	100	0	No	0	25	0	
LH10-879		0	0.0	0	0	100	0	No	0	31	2	
LH10-863		0	0.0	0	0	100	0	No	0	34	1	
LH9-872		0	0.0	0	0	100	0	No	0	25	0	
LH10-854		0	0.0	0	0	100	0	No	0	34	2	
LH10-852		0	0.0	0	0	100	0	No	0	36	2	
LH10-851		0	0.0	0	0	100	0	No	0	36	2	
LH10-846		0	0.0	0	0	100	0	No	0	37	2	
LM12-861		0	0.0	0	0	100	0	No	0	25	0	
LM12-853		0	0.0	0	0	100	0	No	0	25	0	
LM12-841		0	0.0	0	0	100	0	No	0	24	0	
LS6-857		0	0.0	0	0	100	0	No	0	0	2	
LH10-845		0	0.0	0	0	100	0	No	0	19	0	

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LH10-818		0	0.0	0	0	100	0	No	0	15	1	
LM12-800		0	0.0	0	0	100	0	No	0	22	0	
LM12-835		0	0.0	0	0	100	0	No	0	21	0	
LM12-850		0	0.0	0	0	100	0	No	0	24	0	
LH10-842		0	0.0	0	0	100	0	No	0	4	2	
LM12-803		0	0.0	0	0	100	0	No	0	19	0	
LH10-839		0	0.0	0	0	100	0	No	0	3	2	
LH10-815		0	0.0	0	0	100	0	No	0	9	2	
LH10-796		0	0.0	0	0	100	0	No	0	7	1	
LH10-786		0	0.0	0	0	100	0	No	0	3	1	
LH10-848		0	0.0	0	0	100	0	No	0	18	2	
LH10-837		0	0.0	0	0	100	0	No	0	4	2	
LM12-809		0	0.0	0	0	100	0	No	0	3	0	
LH10-807		0	0.0	0	0	100	0	No	0	7	2	
LH10-821		0	0.0	0	0	100	0	No	0	10	0	
LM12-826		0	0.0	0	0	100	0	No	0	20	0	
LH10-849		0	0.0	0	0	100	0	No	0	36	2	
LM12-811		0	0.0	0	0	100	0	No	0	20	0	
LH10-813		0	0.0	0	0	100	0	No	0	2	2	
LH10-802		0	0.0	0	0	100	0	No	0	12	2	
LH10-812		0	0.0	0	0	100	0	No	0	7	2	
LM12-823		0	0.0	0	0	100	0	No	0	3	0	
LM12-795		0	0.0	0	0	100	0	No	0	31	0	
LH10-833		0	0.0	0	0	100	0	No	0	4	2	
LH10-810		0	0.0	0	0	100	0	No	0	14	2	
LH10-792		0	0.0	0	0	100	0	No	0	9	2	
LH10-788		0	0.0	0	0	100	0	No	0	13	2	
LH10-805		0	0.0	0	0	100	0	No	0	10	2	
LH10-827		0	0.0	0	0	100	0	No	0	6	2	
LH10-798		0	0.0	0	0	100	0	No	0	8	1	
LM11-780		0	0.0	0	0	100	0	No	0	38	0	
LM12-801		0	0.0	0	0	100	0	No	0	20	0	
LH9-804		0	0.0	0	0	100	0	No	0	19	2	
LM12-790		0	0.0	0	0	100	0	No	0	47	0	
LH9-774		0	0.0	0	0	100	0	No	0	20	2	
LH9-785		0	0.0	0	0	100	0	No	0	20	2	
LS6-806		0	0.0	0	0	100	0	No	0	20	2	
LH9-782		0	0.0	0	0	100	0	No	0	14	0	
LM12-797		0	0.0	0	0	100	0	No	0	31	0	
LM12-799		0	0.0	0	0	100	0	No	0	31	0	
LM12-783		0	0.0	0	0	100	0	No	0	61	0	
LH10-789		0	0.0	0	0	100	0	No	0	7	2	
LH10-777		0	0.0	0	0	100	0	No	0	18	2	
LM11-776		0	0.0	0	0	100	0	No	0	36	0	

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LH10-764		0	0.0	0	0	100	0	No	0	1	2	
LH10-762		0	0.0	0	0	100	0	No	0	9	2	
LH9-778		0	0.0	0	0	100	0	No	0	19	0	
LH10-763		0	0.0	0	0	100	0	No	0	11	2	
LH10-761		0	0.0	0	0	100	0	No	0	10	2	
LH9-772		0	0.0	0	0	100	0	No	0	19	2	
LH10-760		0	0.0	0	0	100	0	No	0	0	2	
LM12-791		0	0.0	0	0	100	0	No	0	31	0	
LH10-743		0	0.0	0	0	100	0	No	0	13	2	
LH10-765		0	0.0	0	0	100	0	No	0	1	2	
LM12-769		0	0.0	0	0	100	0	No	0	62	0	
LM12-768		0	0.0	0	0	100	0	No	0	63	0	
LH10-759		0	0.0	0	0	100	0	No	0	0	2	
LH9-739		0	0.0	0	0	100	0	No	0	15	0	
LH9-746		0	0.0	0	0	100	0	No	0	3	2	
LH9-754		0	0.0	0	0	100	0	No	0	19	2	
LH9-744		0	0.0	0	0	100	0	No	0	17	0	
LH10-740		0	0.0	0	0	100	0	No	0	8	2	
LH9-753		0	0.0	0	0	100	0	No	0	19	0	
LH9-757		0	0.0	0	0	100	0	No	0	19	0	
LH9-752		0	0.0	0	0	100	0	No	0	19	0	
LH10-736		0	0.0	0	0	100	0	No	0	13	2	
LH9-766		0	0.0	0	0	100	0	No	0	20	0	
LH9-726		0	0.0	0	0	100	0	No	0	22	0	
LH10-750		0	0.0	0	0	100	0	No	0	0	2	
LH10-738		0	0.0	0	0	100	0	No	0	8	2	
LH10-729		0	0.0	0	0	100	0	No	0	7	2	
LH9-745		0	0.0	0	0	100	0	No	0	2	0	
LH9-737		0	0.0	0	0	100	0	No	0	18	0	
LH9-742		0	0.0	0	0	100	0	No	0	14	0	
LH9-734		0	0.0	0	0	100	0	No	0	39	0	
LH9-730		0	0.0	0	0	100	0	No	0	21	0	
LH9-733		0	0.0	0	0	100	0	No	0	24	0	
LH9-732		0	0.0	0	0	100	0	No	0	54	0	
LH9-731		0	0.0	0	0	100	0	No	0	20	0	
LH9-728		0	0.0	0	0	100	0	No	0	21	0	
LH9-727		0	0.0	0	0	100	0	No	0	21	0	
LH9-724		0	0.0	0	0	100	0	No	0	25	0	
LH9-721		0	0.0	0	0	100	0	No	0	25	0	
LH10-707		0	0.0	0	0	100	0	No	0	7	2	
LH10-714		0	0.0	0	0	100	0	No	0	7	0	
LH10-708		0	0.0	0	0	100	0	No	0	8	0	
LH1-716		0	0.0	0	0	100	0	No	0	8	0	
LH9-717		0	0.0	0	0	100	0	No	0	25	0	

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LH10-710		0	0.0	0	0	100	0	No	0	8	0	
LH1-715		0	0.0	0	0	100	0	No	0	11	0	
LH10-702		0	0.0	0	0	100	0	No	0	8	0	
LM12-706		0	0.0	0	0	100	0	No	0	64	0	
LH10-703		0	0.0	0	0	100	0	No	0	8	0	
LH9-713		0	0.0	0	0	100	0	No	0	27	0	
LH10-704		0	0.0	0	0	100	0	No	0	8	2	
LH10-701		0	0.0	0	0	100	0	No	0	8	0	
LM11-700		0	0.0	0	0	100	0	No	0	36	0	
LM12-694		0	0.0	0	0	100	0	No	0	67	0	
LM11-698		0	0.0	0	0	100	0	No	0	37	0	
LM12-691		0	0.0	0	0	100	0	No	0	66	0	
LH10-695		0	0.0	0	0	100	0	No	0	8	0	
LM12-690		0	0.0	0	0	100	0	No	0	22	0	
LM11-696		0	0.0	0	0	100	0	No	0	32	0	
LH10-689		0	0.0	0	0	100	0	No	0	8	0	
LM12-686		0	0.0	0	0	100	0	No	0	17	0	
LM12-687		0	0.0	0	0	100	0	No	0	29	0	
LM12-685		0	0.0	0	0	100	0	No	0	17	0	
LM12-683		0	0.0	0	0	100	0	No	0	17	0	
LM12-679		0	0.0	0	0	100	0	No	0	58	0	
LM12-676		0	0.0	0	0	100	0	No	0	0	1	
LM12-680		0	0.0	0	0	100	0	No	0	0	0	
LM12-677		0	0.0	0	0	100	0	No	0	58	0	
LM12-667		0	0.0	0	0	100	0	No	0	28	0	
LM12-668		0	0.0	0	0	100	0	No	0	29	0	
LM12-664		0	0.0	0	0	100	0	No	0	27	0	
LM12-661		0	0.0	0	0	100	0	No	0	52	0	
LM12-670		0	0.0	0	0	100	0	No	0	30	0	
LM12-663		0	0.0	0	0	100	0	No	0	53	0	
LM12-671		0	0.0	0	0	100	0	No	0	28	0	
LM11-669		0	0.0	0	0	100	0	No	0	38	0	
LM12-658		0	0.0	0	0	100	0	No	0	36	0	
LM12-666		0	0.0	0	0	100	0	No	0	5	0	
LM12-660		0	0.0	0	0	100	0	No	0	34	0	
LM10-678		0	0.0	0	0	100	0	No	0	3	0	
LM12-648		0	0.0	0	0	100	0	No	0	4	0	
LM12-662		0	0.0	0	0	100	0	No	0	51	0	
LM12-657		0	0.0	0	0	100	0	No	0	36	0	
LM12-644		0	0.0	0	0	100	0	No	0	1	0	
LM12-654		0	0.0	0	0	100	0	No	0	37	0	
LM11-655		0	0.0	0	0	100	0	No	0	14	0	
LM10-665		0	0.0	0	0	100	0	No	0	5	0	
LM12-651		0	0.0	0	0	100	0	No	0	40	0	

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LM12-650		0	0.0	0	0	100	0	No	0	1	0	
LM12-642		0	0.0	0	0	100	0	No	0	1	0	
LM12-649		0	0.0	0	0	100	0	No	0	2	0	
LM12-640		0	0.0	0	0	100	0	No	0	2	1	
LM12-641		0	0.0	0	0	100	0	No	0	1	0	
LM12-643		0	0.0	0	0	100	0	No	0	3	0	
LM12-646		0	0.0	0	0	100	0	No	0	3	0	
LM12-634		0	0.0	0	0	100	0	No	0	1	0	
LM12-636		0	0.0	0	0	100	0	No	0	2	0	
LM12-638		0	0.0	0	0	100	0	No	0	1	0	
LM12-633		0	0.0	0	0	100	0	No	0	1	0	
LM12-631		0	0.0	0	0	100	0	No	0	1	0	
LM12-637		0	0.0	0	0	100	0	No	0	1	0	
LM12-632		0	0.0	0	0	100	0	No	0	2	0	
LM12-617		0	0.0	0	0	100	0	No	0	19	2	
LM12-629		0	0.0	0	0	100	0	No	0	2	1	
LM12-625		0	0.0	0	0	100	0	No	0	3	0	
LM12-619		0	0.0	0	0	100	0	No	0	0	0	
LM12-622		0	0.0	0	0	100	0	No	0	0	2	
LM12-627		0	0.0	0	0	100	0	No	0	1	0	
LM12-620		0	0.0	0	0	100	0	No	0	28	2	
LM12-612		0	0.0	0	0	100	0	No	0	6	2	
LM12-628		0	0.0	0	0	100	0	No	0	4	2	
LH10-599		0	0.0	0	0	100	0	No	0	8	2	
LM12-621		0	0.0	0	0	100	0	No	0	28	0	
LM12-623		0	0.0	0	0	100	0	No	0	2	2	
LM12-613		0	0.0	0	0	100	0	No	0	6	0	
LH10-600		0	0.0	0	0	100	0	No	0	9	2	
LH10-603		0	0.0	0	0	100	0	No	0	1	2	
LH8-616		0	0.0	0	0	100	0	No	0	23	0	
LM12-614		0	0.0	0	0	100	0	No	0	19	2	
LM12-618		0	0.0	0	0	100	0	No	0	9	0	
LM12-604		0	0.0	0	0	100	0	No	0	27	0	
LM12-608		0	0.0	0	0	100	0	No	0	4	0	
LM12-597		0	0.0	0	0	100	0	No	0	28	2	
LM11-611		0	0.0	0	0	100	0	No	0	37	0	
LM11-615		0	0.0	0	0	100	0	No	0	33	0	
LM12-593		0	0.0	0	0	100	0	No	0	23	0	
LM12-586		0	0.0	0	0	100	0	No	0	20	0	
LM12-595		0	0.0	0	0	100	0	No	0	21	2	
LM11-607		0	0.0	0	0	100	0	No	0	37	0	
LH10-589		0	0.0	0	0	100	0	No	0	9	2	
LM12-584		0	0.0	0	0	100	0	No	0	0	0	
LM11-592		0	0.0	0	0	100	0	No	0	32	0	

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LH8-580		0	0.0	0	0	100	0	No	0	31	0	
LM11-601		0	0.0	0	0	100	0	No	0	33	0	
LM10-587		0	0.0	0	0	100	0	No	0	5	1	
LM10-579		0	0.0	0	0	100	0	No	0	9	1	
LM12-574		0	0.0	0	0	100	0	No	0	6	0	
LH8-575		0	0.0	0	0	100	0	No	0	31	0	
LM10-577		0	0.0	0	0	100	0	No	0	6	1	
LM12-568		0	0.0	0	0	100	0	No	0	1	0	
LM12-571		0	0.0	0	0	100	0	No	0	3	0	
LM12-565		0	0.0	0	0	100	0	No	0	13	0	
LM11-569		0	0.0	0	0	100	0	No	0	33	0	
LM11-566		0	0.0	0	0	100	0	No	0	34	0	
LM12-562		0	0.0	0	0	100	0	No	0	3	0	
LM13-561		0	0.0	0	0	100	0	No	0	12	0	
LH8-559		0	0.0	0	0	100	0	No	0	31	0	
LH8-556		0	0.0	0	0	100	0	No	0	31	0	
LM11-557		0	0.0	0	0	100	0	No	0	27	0	
LM12-549		0	0.0	0	0	100	0	No	0	6	0	
LM11-555		0	0.0	0	0	100	0	No	0	32	0	
LM11-554		0	0.0	0	0	100	0	No	0	27	0	
LM12-547		0	0.0	0	0	100	0	No	0	13	0	
LM9-553		0	0.0	0	0	100	0	No	0	9	0	
LM9-551		0	0.0	0	0	100	0	No	0	9	0	
LM11-546		0	0.0	0	0	100	0	No	0	37	0	
LM11-548		0	0.0	0	0	100	0	No	0	24	0	
LM9-552		0	0.0	0	0	100	0	No	0	8	0	
LH8-545		0	0.0	0	0	100	0	No	0	31	0	
LH8-544		0	0.0	0	0	100	0	No	0	31	0	
LM9-550		0	0.0	0	0	100	0	No	0	24	0	
LM9-543		0	0.0	0	0	100	0	No	0	24	0	
LM12-540		0	0.0	0	0	100	0	No	0	14	0	
LM12-538		0	0.0	0	0	100	0	No	0	1	0	
LM9-542		0	0.0	0	0	100	0	No	0	21	0	
LM12-530		0	0.0	0	0	100	0	No	0	14	0	
LM10-539		0	0.0	0	0	100	0	No	0	9	0	
LM11-536		0	0.0	0	0	100	0	No	0	34	0	
LM10-533		0	0.0	0	0	100	0	No	0	7	0	
LM10-535		0	0.0	0	0	100	0	No	0	7	0	
LM10-534		0	0.0	0	0	100	0	No	0	6	0	
LM10-527		0	0.0	0	0	100	0	No	0	7	0	
LM10-532		0	0.0	0	0	100	0	No	0	7	0	
LM10-529		0	0.0	0	0	100	0	No	0	7	0	
LM12-524		0	0.0	0	0	100	0	No	0	1	0	
LM12-520		0	0.0	0	0	100	0	No	0	3	0	

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LM13-518		0	0.0	0	0	100	0	No	0	13	1	
LM12-517		0	0.0	0	0	100	0	No	0	0	0	
LM11-519		0	0.0	0	0	100	0	No	0	32	0	
LM12-516		0	0.0	0	0	100	0	No	0	2	0	
LM12-515		0	0.0	0	0	100	0	No	0	2	0	
LH8-514		0	0.0	0	0	100	0	No	0	31	0	
LH8-513		0	0.0	0	0	100	0	No	0	29	0	
LM1-508		0	0.0	0	0	100	0	No	0	7	0	
LM1-510		0	0.0	0	0	100	0	No	0	8	0	
LM9-512		0	0.0	0	0	100	0	No	0	22	0	
LM1-505		0	0.0	0	0	100	0	No	0	7	0	
LM1-503		0	0.0	0	0	100	0	No	0	8	0	
LM1-502		0	0.0	0	0	100	0	No	0	6	0	
LM1-499		0	0.0	0	0	100	0	No	0	7	0	
LM1-496		0	0.0	0	0	100	0	No	0	7	0	
LM9-500		0	0.0	0	0	100	0	No	0	20	0	
LM1-494		0	0.0	0	0	100	0	No	0	8	0	
LM9-498		0	0.0	0	0	100	0	No	0	20	0	
LM1-493		0	0.0	0	0	100	0	No	0	9	0	
LM9-495		0	0.0	0	0	100	0	No	0	20	0	
LH8-487		0	0.0	0	0	100	0	No	0	31	0	
LM11-489		0	0.0	0	0	100	0	No	0	18	1	
LH8-484		0	0.0	0	0	100	0	No	0	30	0	
LM9-488		0	0.0	0	0	100	0	No	0	16	0	
LM11-482		0	0.0	0	0	100	0	No	0	28	1	
LM1-471		0	0.0	0	0	100	0	No	0	10	0	
LH8-477		0	0.0	0	0	100	0	No	0	30	0	
LM1-470		0	0.0	0	0	100	0	No	0	14	0	
LM11-480		0	0.0	0	0	100	0	No	0	38	1	
LH8-478		0	0.0	0	0	100	0	No	0	31	0	
LM1-468		0	0.0	0	0	100	0	No	0	9	0	
LM1-463		0	0.0	0	0	100	0	No	0	10	0	
LM1-462		0	0.0	0	0	100	0	No	0	10	0	
LM1-467		0	0.0	0	0	100	0	No	0	3	0	
LM1-461		0	0.0	0	0	100	0	No	0	11	0	
LM11-475		0	0.0	0	0	100	0	No	0	26	1	
LM11-476		0	0.1	3	0	100	0	No	0	22	1	
LM11-472		0	0.0	0	0	100	0	No	0	23	1	
LM1-457		0	0.0	0	0	100	0	No	0	11	0	
LM1-449		0	0.0	0	0	100	0	No	0	12	0	
LM1-454		0	0.0	0	0	100	0	No	0	12	0	
LM1-442		0	0.0	0	0	100	0	No	0	3	0	
LM1-443		0	0.0	0	0	100	0	No	0	13	0	
LM1-444		0	0.0	0	0	100	0	No	0	12	0	

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LM11-453		0	0.0	0	0	100	0	No	0	17	1	
LM9-459		0	0.0	0	0	100	0	No	0	19	0	
LM11-448		0	0.0	0	0	100	0	No	0	2	1	
LM11-447		0	0.0	0	0	100	0	No	0	4	1	
LM11-445		0	0.0	0	0	100	0	No	0	4	1	
LM1-438		0	0.0	0	0	100	0	No	0	15	0	
LM1-436		0	0.0	0	0	100	0	No	0	24	0	
LM1-435		0	0.0	0	0	100	0	No	0	15	0	
LM11-441		0	0.0	0	0	100	0	No	0	13	1	
LM11-439		0	0.0	0	0	100	0	No	0	19	1	
LH8-437		0	0.0	0	0	100	0	No	0	31	0	
LM11-434		0	0.0	0	0	100	0	No	0	20	1	
LM1-429		0	0.0	0	0	100	0	No	0	31	0	
LH8-431		0	0.0	0	0	100	0	No	0	31	0	
LM1-425		0	0.0	0	0	100	0	No	0	28	0	
LM1-426		0	0.0	0	0	100	0	No	0	30	0	
LM2-423		0	0.0	0	0	100	0	No	0	33	0	
LM2-417		0	0.0	0	0	100	0	No	0	31	0	
LM11-422		0	0.0	0	0	100	0	No	0	16	2	
LM2-420		0	0.0	0	0	100	0	No	0	37	0	
LM2-415		0	0.0	0	0	100	0	No	0	18	0	
LM2-412		0	0.0	0	0	100	0	No	0	19	0	
LM11-419		0	0.0	0	0	100	0	No	0	32	2	
LM10-413		0	0.0	0	0	100	0	No	0	7	0	
LM11-409		0	0.0	0	0	100	0	No	0	31	2	
LH7-401		0	0.0	0	0	100	0	No	0	29	0	
LM1-395		0	0.0	0	0	100	0	No	0	26	0	
LM11-393		0	0.0	0	0	100	0	No	0	16	2	
LM11-398		0	0.0	0	0	100	0	No	0	34	2	
LH7-396		0	0.0	0	0	100	0	No	0	28	0	
LM11-397		0	0.0	0	0	100	0	No	0	17	2	
LM9-392		0	0.0	0	0	100	0	No	0	23	0	
LM11-388		0	0.0	0	0	100	0	No	0	37	2	
LH7-385		0	0.0	0	0	100	0	No	0	29	0	
LM2-384		0	0.0	0	0	100	0	No	0	19	2	
LM9-387		0	0.0	0	0	100	0	No	0	23	0	
LM9-390		0	0.0	0	0	100	0	No	0	23	0	
LM9-386		0	0.0	0	0	100	0	No	0	22	0	
LH7-378		0	0.0	0	0	100	0	No	0	21	2	
LM2-377		0	0.0	0	0	100	0	No	0	19	2	
LM2-375		0	0.0	0	0	100	0	No	0	16	2	
LM2-371		0	0.0	0	0	100	0	No	0	18	2	
LM10-380		0	0.0	0	0	100	0	No	0	9	1	
LH7-374		0	0.0	0	0	100	0	No	0	21	2	

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LM2-369		0	0.0	0	0	100	0	No	0	18	2	
LM2-361		0	0.0	0	0	100	0	No	0	35	2	
LH7-368		0	0.0	0	0	100	0	No	0	33	1	
LH7-359		0	0.0	0	0	100	0	No	0	21	1	
LH7-355		0	0.0	0	0	100	0	No	0	28	0	
LH7-356		0	0.0	0	0	100	0	No	0	28	1	
LM10-362		0	0.0	3	0	100	0	No	0	4	1	
LH7-354		0	0.0	0	0	100	0	No	0	27	1	
LH7-350		0	0.0	0	0	100	0	No	0	26	0	
LM11-352		0	0.0	0	0	100	0	No	0	20	2	
LH7-349		0	0.0	0	0	100	0	No	0	26	0	
LM13-347		0	0.0	0	0	100	0	No	0	0	0	
LM10-343		0	0.0	0	0	100	0	No	0	8	0	
LH7-336		0	0.0	0	0	100	0	No	0	3	0	
LH7-337		0	0.0	0	0	100	0	No	0	14	0	
LM2-335		0	0.0	0	0	100	0	No	0	35	2	
LM2-333		0	0.0	0	0	100	0	No	0	34	2	
LM2-332		0	0.0	0	0	100	0	No	0	33	2	
LM2-331		0	0.0	0	0	100	0	No	0	32	2	
LM2-330		0	0.0	0	0	100	0	No	0	29	2	
LM2-329		0	0.0	0	0	100	0	No	0	31	2	
LM2-323		0	0.0	0	0	100	0	No	0	16	2	
LH6-325		0	0.0	0	0	100	0	No	0	17	0	
LM2-317		0	0.0	0	0	100	0	No	0	14	2	
LH6-316		0	0.0	0	0	100	0	No	0	16	0	
LM2-315		0	0.0	0	0	100	0	No	0	13	2	
LM2-311		0	0.0	0	0	100	0	No	0	13	2	
LH6-313		0	0.0	0	0	100	0	No	0	15	0	
LM2-305		0	0.0	0	0	100	0	No	0	13	2	
LH6-306		0	0.0	0	0	100	0	No	0	16	0	
LH6-309		0	0.0	0	0	100	0	No	0	14	0	
LM2-302		0	0.0	0	0	100	0	No	0	12	2	
LH6-303		0	0.0	0	0	100	0	No	0	13	0	
LM11-307		0	0.0	0	0	100	0	No	0	33	1	
LM11-304		0	0.0	0	0	100	0	No	0	34	1	
LH6-301		0	0.0	0	0	100	0	No	0	12	0	
LH6-300		0	0.0	0	0	100	0	No	0	12	0	
LH6-298		0	0.0	0	0	100	0	No	0	11	0	
LH6-297		0	0.0	0	0	100	0	No	0	3	0	
LM11-299		0	0.0	0	0	100	0	No	0	17	1	
LH6-296		0	0.0	0	0	100	0	No	0	2	0	
LH6-295		0	0.0	0	0	100	0	No	0	2	0	
LM3-292		0	0.0	0	0	100	0	No	0	38	0	
LM3-291		0	0.0	0	0	100	0	No	0	38	1	

TNC Complex Number	TNC Complex Name	Acres	Houses per Acre (year 2000)	TNC Threat Score	Gov't Owned (%)	Private Owned (%)	NGO Owned (%)	Lighthouse	Elevation, from water surface (m)	Miles to Closest NWR	Key Ecological Systems (#)	Birds of Conservation Concern (AOU code)
LM11-293		0	0.0	0	0	100	0	No	0	21	1	
LH6-288		0	0.0	0	0	100	0	No	0	7	0	
LM11-289		0	0.0	0	0	100	0	No	0	37	0	
LM11-286		0	0.0	0	0	100	0	No	0	27	0	
LM10-284		0	0.0	0	0	100	0	No	0	7	1	
LM11-280		0	0.0	0	0	100	0	No	0	26	0	
LM11-276		0	0.0	0	0	100	0	No	0	28	0	
LM11-271		0	0.0	0	0	100	0	No	0	36	0	
LM11-272		0	0.0	0	0	100	0	No	0	28	0	
LM11-270		0	0.0	0	0	100	0	No	0	32	0	
LM11-268		0	0.0	0	0	100	0	No	0	36	0	
LM11-266		0	0.0	0	0	100	0	No	0	22	0	
LM11-267		0	0.0	0	0	100	0	No	0	31	0	
LM11-265		0	0.0	0	0	100	0	No	0	29	0	
LH4-238		0	0.0	0	0	100	0	No	0	9	0	
LH6-226		0	0.0	0	0	100	0	No	0	3	0	
LH4-230		0	0.0	0	0	100	0	No	0	12	0	
LH4-227		0	0.0	0	0	100	0	No	0	1	0	
LH4-225		0	0.0	0	0	100	0	No	0	19	0	
LH5-215		0	0.0	0	0	100	0	No	0	2	0	
LH4-222		0	0.0	0	0	100	0	No	0	19	0	
LH4-220		0	0.0	0	0	100	0	No	0	25	0	
LH5-210		0	0.0	0	0	100	0	No	0	1	0	
LH4-221		0	0.0	0	0	100	0	No	0	19	0	
LH4-216		0	0.0	0	0	100	0	No	0	32	0	
LH4-219		0	0.0	0	0	100	0	No	0	23	0	
LH4-208		0	0.0	0	0	100	0	No	0	0	0	
LH4-205		0	0.0	0	0	100	0	No	0	21	0	
LH4-204		0	0.0	0	0	100	0	No	0	17	0	
LM8-207		0	0.0	0	0	100	0	No	0	38	0	
LH5-197		0	0.0	0	0	100	0	No	0	3	0	
LH5-193		0	0.0	0	0	100	0	No	0	3	2	
LH5-195		0	0.0	0	0	100	0	No	0	1	0	
LH5-192		0	0.0	0	0	100	0	No	0	23	0	
LH5-199		0	0.0	0	0	100	0	No	0	2	1	
LH5-194		0	0.0	0	0	100	0	No	0	9	1	
LH4-196		0	0.0	0	0	100	0	No	0	21	0	
LH4-189		0	0.0	0	0	100	0	No	0	20	0	
LH4-188		0	0.0	0	0	100	0	No	0	34	0	
LH4-186		0	0.0	0	0	100	0	No	0	34	0	
LH4-184		0	0.0	0	0	100	0	No	0	34	0	
LH5-179		0	0.0	0	0	100	0	No	0	11	0	
LH4-180		0	0.0	0	0	100	0	No	0	30	0	
LH4-178		0	0.0	0	0	100	0	No	0	36	0	

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LH4-176		0	0.0	0	0	100	0	No	0	35	0	
LH4-169		0	0.0	0	0	100	0	No	0	35	0	
LH5-162		0	0.0	0	0	100	0	No	0	9	2	
LH4-167		0	0.0	0	0	100	0	No	0	36	0	
LH4-166		0	0.0	0	0	100	0	No	0	36	0	
LH5-160		0	0.0	0	0	100	0	No	0	9	2	
LH4-138		0	0.0	0	0	100	0	No	0	36	0	
LM11-281		0	0.0	0	0	100	0	No	0	33	0	
LH5-130		0	0.0	0	0	100	0	No	0	24	2	
LH5-126		0	0.0	0	0	100	0	No	0	9	2	
LH5-125		0	0.0	0	0	100	0	No	0	11	2	
LH5-122		0	0.0	0	0	100	0	No	0	24	2	
LH4-124		0	0.0	0	0	100	0	No	0	36	0	
LH4-121		0	0.0	0	0	100	0	No	0	36	0	
LH4-120		0	0.0	0	0	100	0	No	0	37	0	
LH4-119		0	0.0	0	0	100	0	No	0	37	0	
LH4-116		0	0.0	0	0	100	0	No	0	38	0	
LH4-117		0	0.0	0	0	100	0	No	0	37	0	
LH4-114		0	0.0	0	0	100	0	No	0	39	0	
LH4-115		0	0.0	0	0	100	0	No	0	38	0	
LH4-110		0	0.0	0	0	100	0	No	0	39	0	
LH4-111		0	0.0	0	0	100	0	No	0	39	0	
LH4-108		0	0.0	0	0	100	0	No	0	40	0	
LH4-106		0	0.0	0	0	100	0	No	0	44	0	
LH4-105		0	0.0	0	0	100	0	No	0	44	0	
LH4-103		0	0.0	0	0	100	0	No	0	45	0	
LH4-98		0	0.0	0	0	100	0	No	0	3	0	
LH4-97		0	0.0	0	0	100	0	No	0	14	0	
LH4-94		0	0.0	0	0	100	0	No	0	13	0	
LH4-93		0	0.0	0	0	100	0	No	0	11	0	
LM7-80		0	0.0	0	0	100	0	No	0	36	0	