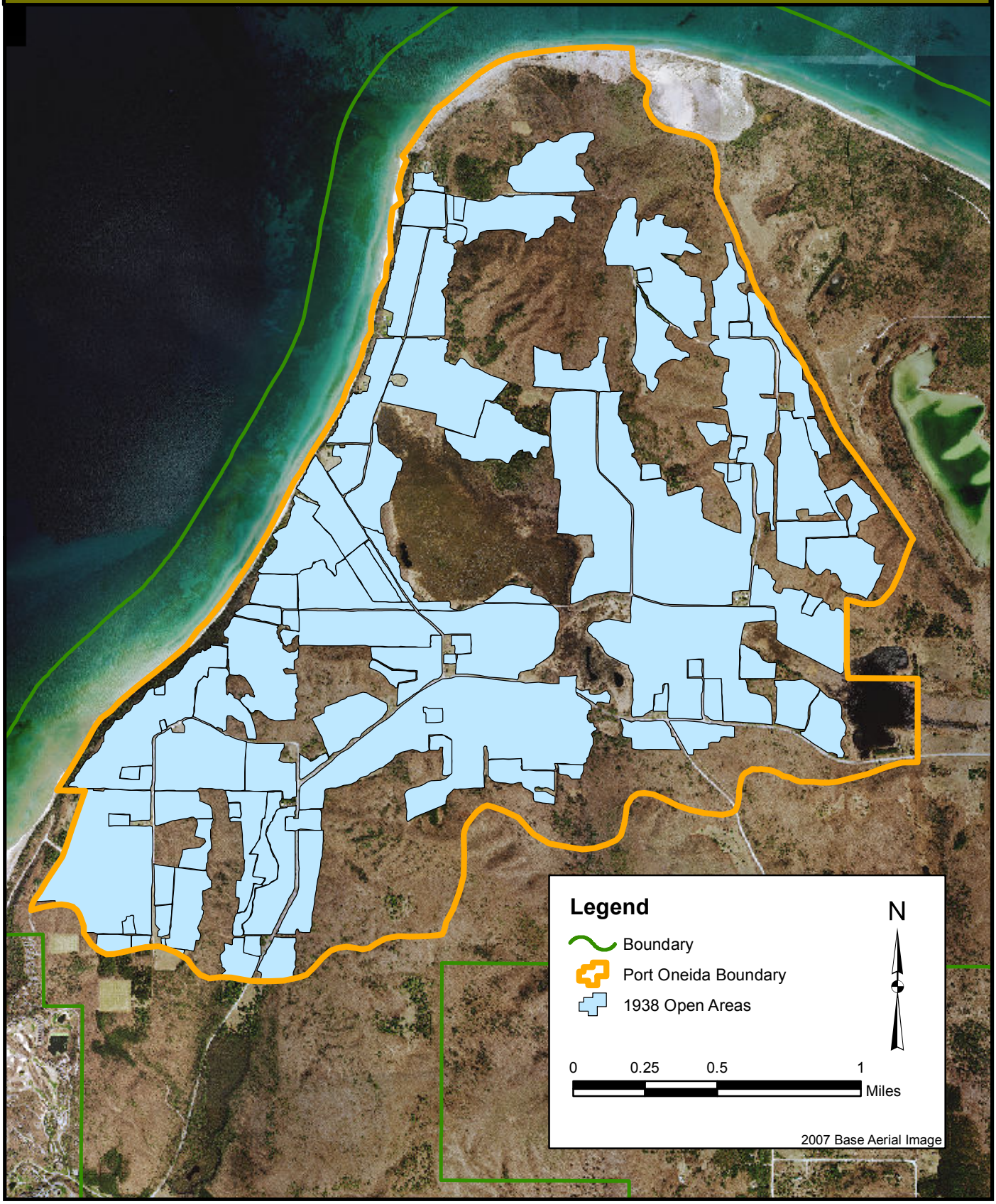
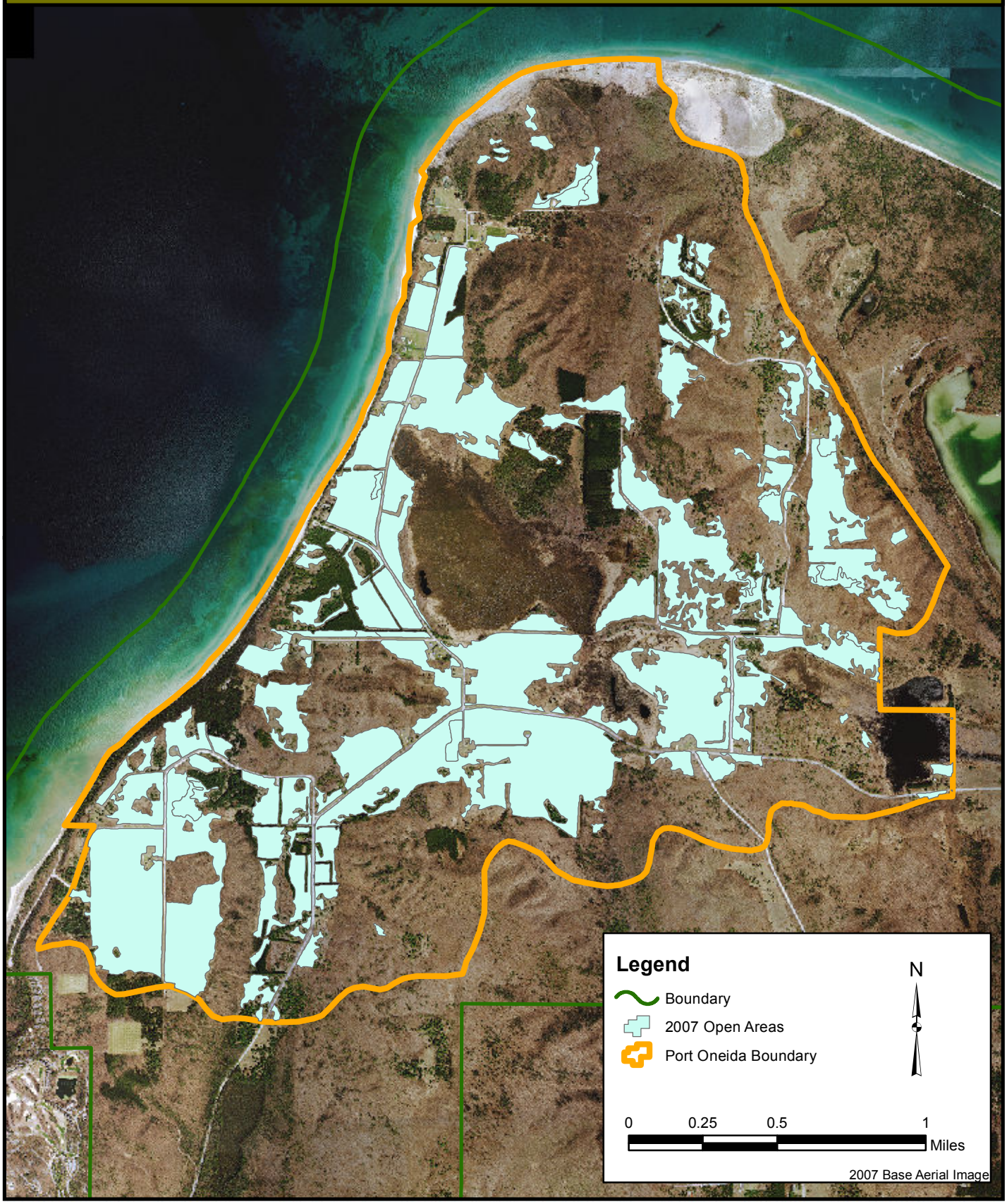
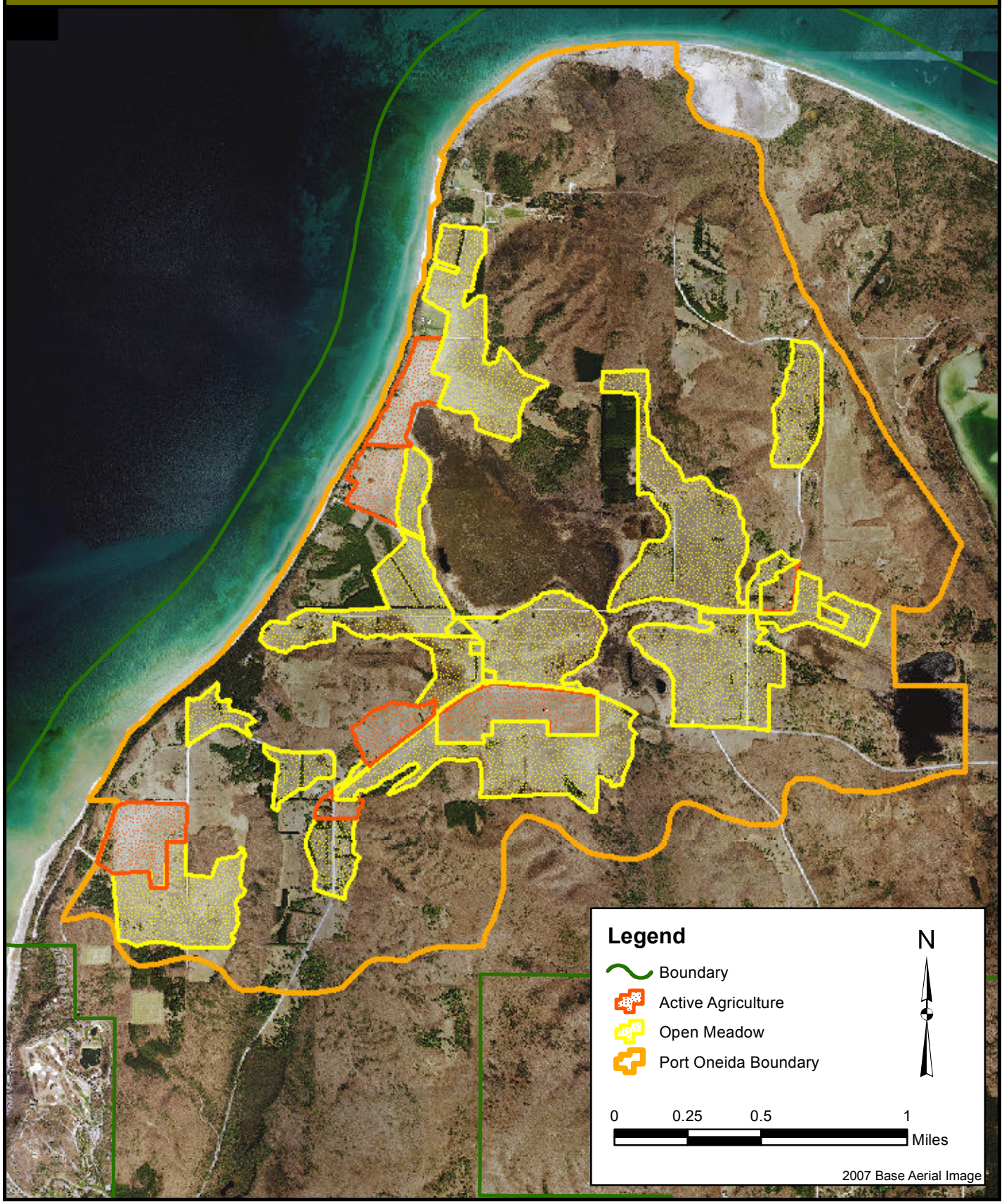
Map A-6: Port Oneida Landscape Management Plan/Environmental Assessment 1938 Open Areas



Map A-7: Port Oneida Landscape Management Plan/Environmental Assessment 2007 Open Areas



Map A-8: Port Oneida Landscape Management Plan/Environmental Assessment Composite of Fields Addressed in this Plan



Map A-9: Port Oneida Landscape Management Plan/Environmental Assessment Surface Waters and Wetlands in Port Oneida

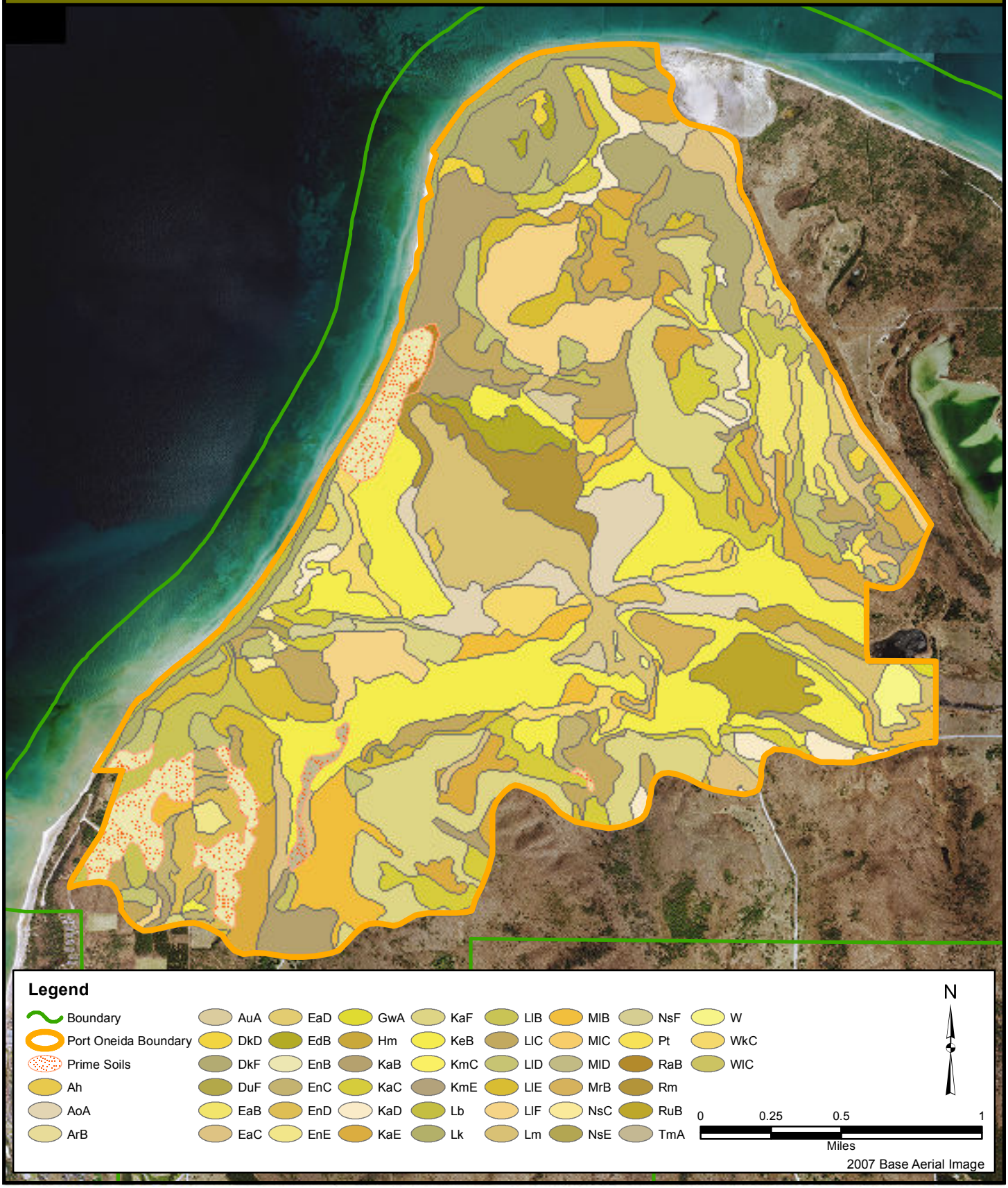
Map A-10: Port Oneida Landscape Management Plan/Environmental Assessment Vegetation in Port Oneida

Legend

- Boundary
- Port Oneida Boundary
- Aspen - Birch - Red Maple Forest
- Beech - Maple - Northern Hardwoods Forest
- Black Ash - Mixed Hardwood Swamp
- Black Spruce - Tamarack / Labrador-tea Poor Swamp
- Bluejoint Wet Meadow
- Bracken Grassland
- Conifer - Deciduous Ruderal Shrubland
- Conifer - Hardwood Ruderal Forest
- Conifer Plantation
- Conifer Ruderal Forest
- Conifer Ruderal Shrubland
- Deciduous Ruderal Shrubland
- Developed Area
- Dogwood - Willow Swamp
- Gray Alder Swamp
- Great Lakes Beach
- Great Lakes Beachgrass Dune
- Great Lakes Hemlock - Beech - Hardwood Forest
- Hardwood Ruderal Forest
- Leatherleaf Poor Fen
- Midwest Mixed Emergent Deep Marsh
- Midwest Pondweed Submerged Aquatic Wetland
- Northern Great Lakes Emergent Marsh
- Northern Red Oak - Sugar Maple Forest
- Northern Sedge Wet Meadow
- Northern Water-lily Aquatic Wetland
- Open Water Lake
- Open Water Pond
- Red Maple - Ash - Birch Swamp Forest
- Red Pine - Aspen - Birch Forest
- Red Pine / Blueberry Dry Forest
- Ruderal Grassland
- Sand & Cobble Beach
- Sugar Maple - Ash - Basswood Northern Rich Mesic Forest
- Wet Meadow Mixed Herbaceous
- White Pine - Aspen - Birch Forest
- White Pine - Red Oak Forest
- White-cedar - (Mixed Conifer) / Alder Swamp
- White-cedar - Boreal Conifer Mesic Forest

2007 Base Aerial Image

Map A-11: Port Oneida Landscape Management Plan/Environmental Assessment Soils in Port Oneida



KEY TO SOILS TYPES IN MAP A-11

Soil Symbol	Soil Description
Ah	Adrian-Houghton mucks
ArB	Alcona-Richter sandy loams, 2-6 percent
AuA	Au Gres-Kalkaska sands, 0-4 percent slopes
DkD	Deer Park sand, 6-18 percent slopes
DkF	Deer Park sand, 18-45 percent slopes
Du	Dune land
EaB	East Lake loamy sand, 0-6 percent slopes
EaC	East Lake loamy sand, 6-12 percent slopes
EaD	East Lake loamy sand, 12-18 percent slopes
EdB	Eastport sand, 0-6 percent slopes
EnB	Emmet-Leelanau complex, 2-6 percent slopes
EnC	Emmet-Leelanau complex, 6-12 percent slopes
EnD	Emmet-Leelanau complex, 12-18 percent slopes
EnE	Emmet-Leelanau complex, 18-25 percent slopes
Hm	Hettinger-Muck complex
KaB	Kalkaska sand, 0-6 percent slopes
KaC	Kalkaska sand, 6-12 percent slopes
KaD	Kalkaska sand, 12-18 percent slopes
KaE	Kalkaska sand, 18-25 percent slopes
KaF	Kalkaska sand, 25-45 percent slopes
KeB	Kalkaska-East lake loamy sands, 0-6 percent slopes
KmC	Kiva-Mancelona gravelly sandy loams, 6-12 percent slopes
KmE	Kiva-Mancelona gravelly sandy loams, 18-25 percent slopes
Lb	Lake beaches
Lk	Lake bluffs
LIB	Leelanau-East Lake loamy sands, 0-6 percent slopes
LIC	Leelanau-East Lake loamy sands, 6-12 percent slopes
LID	Leelanau-East Lake loamy sands, 12-18 percent slopes
LIE	Leelanau-East Lake loamy sands, 18-25 percent slopes
LIF	Leelanau-East Lake loamy sands, 25-45 percent slopes
Lm	Lupton-Markey mucks
MIB	Mancelona-East Lake loamy sands, 0-6 percent slopes
MIC	Mancelona-East Lake loamy sands, 6-12 percent slopes
MID	Mancelona-East Lake loamy sands, 12-18 percent slopes
MrB	Mancelona-Richter gravelly sandy loams, 0-6 percent slopes
NsC	Nester silt loam, 6-12 percent slopes
NsE	Nester silt loam, 18-25 percent slopes
NsF	Nester silt loam, 25-50 percent slopes
Pt	Pits, gravel
RaB	Richter-Alcona sandy loams, 2-6 percent slopes
Rm	Roscommon sand-Markey muck
TmA	Tonkey-Munuscong-Iosco sandy loams, 0-2 percent slopes
W	Water
WkC	Wallace-Kalkaska sands, 2-12 percent slopes
WIC	Wind eroded land, sloping

Appendix B. Other Information

B-1. Determination of Impairment
B-2. General Recommendations for Maintaining Landscape Features
B-3. November 4, 2010 Public Scoping Letter
B-4. November 8, 2010 Press Release
B-5. April 12, 2011 Public Comment Summary

Appendix B-1. Determination of Impairment

In addition to determining the environmental consequences of the alternatives, NPS *Management Policies 2006* and DO-12 require an analysis of potential effects to determine if actions would impair park resources. The fundamental purpose of the national park system established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park and monument resources and values. However, the laws give NPS management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute an impairment of the affected resources and values. Although Congress has given NPS management discretion to allow certain impacts within parks, that discretion is limited by statutory requirements that the Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise.

The prohibited impairment is an impact that would, in the professional judgment of the responsible NPS manager, harm the integrity of park resources or values, including opportunities that would otherwise be present for the enjoyment of those resources or values. An impact to any park resource or value may constitute an impairment. However, an impact would more likely constitute an impairment to the extent it affects a resource or value whose conservation is:

- necessary to fulfill specific park purposes identified in the establishment legislation or proclamation of the park;
- key to the natural and cultural integrity of the park or to opportunities for enjoyment of the park; or
- identified as a goal in the park's general management plan or other relevant NPS planning documents.

An impact would be less likely to constitute an impairment if it is an unavoidable result of an action necessary to preserve or restore the integrity of park resources or values, and it cannot be further mitigated. Impairment may result from visitor activities; NPS administrative activities; or activities undertaken by concessioners, contractors, and others operating in the park. Impairment may also result from sources or activities outside of the park. An impairment determination is not made for visitor experience/recreational values, socioeconomic values, or park operations as these impact areas are not generally considered park resources or values according to the Organic Act and cannot be impaired in the same way that an action can impair park resources and values.

Based on the aforementioned guidelines and basis for determining impairment of park resources and values, a determination of impairment is made for each of the resource impact topics carried forward and analyzed in the environmental assessment for the Preferred Alternative.

Cultural Resources

Since the end of agricultural activity in Port Oneida, historic spatial patterns have incrementally deteriorated. The physical and visual connections between landscape features, agricultural buildings, and community landmarks have diminished, and the number and diversity of historic plant materials has decreased. The overall result is diminished integrity of design, setting, materials, workmanship, feeling, and association in the historic landscape; the seven qualities that make up historic integrity.

Since 1984, the National Lakeshore has been mowing fields to provide a sense of the park's agricultural

history, preserve wildlife habitat, and make visible significant glacial and geologic formations. The open fields provide habitat for upland sandpipers, bluebirds, bobolinks, field sparrows, harriers (marsh hawks), ground squirrels and red fox. White-tailed deer and other species that spend most of their time in forests also utilize the fields. The National Lakeshore's *Open Field Management Plan (1990)* established a regimen of mowing and hand removal to keep uncultivated fields open. The plan has been partially implemented and does not include many important fields in Port Oneida.

In the past, historic field edges have been determined by studying aerial photographs and field work. Encroaching native and non-native woody vegetation in fields and important view sheds is removed in an ad hoc manner as funding is available. Due to slow succession, some of the fields are open and some include growth of pin cherry, black locust, juniper, red pine, and other species. Mowing has controlled some of the woody vegetation growth and kept the fields open. Significant clearing activities have been implemented during the past five years on fields that have high historic integrity, are adjacent roads travelled by many park visitors, and have high opportunities for recreation use: Kelderhouse, Peter Burfiend, and Lawr fields (2006), Carsten Burfiend and Barratt fields (2008), and Dechow and Charles Olson fields (2010). Clearing has been conducted using a variety of methods such as mowing, mowing and herbicide application, cutting (with and without herbicide application), and pulling.

The landscape of Port Oneida conveys at least 150 years of human manipulation. The most recent agricultural use resulted in physical elements that interrelate to create large-scale patterns and define space. Port Oneida is part of a glacially formed landscape that includes moraines, bluffs, ridges and hills. The ridges and hills are covered with woodland forests, forming an important backdrop for the cultural landscape. Lake Michigan is a major presence in Port Oneida, having a significant climatic, sensory, and visual impact on the area. The setting today remains much the way it appeared while agricultural activity was present.

Along with the open meadows that were once cultivated or grazed by livestock, Port Oneida's landscape includes non-native and native plants that were introduced for agricultural and ornamental purposes. These include sugar maple tree rows, conifer windbreaks, pine plantations, remnant orchards, and ornamental plantings such as lilacs and roses. This mix of vegetative cover presents the primary challenge to maintaining the historic character of the district. As these features age and decline, the landscape integrity will diminish.

The purpose of the National Lakeshore, according to the 2009 GMP, is to "Preserve outstanding natural features, including forests, beaches, dune formations, and ancient glacial phenomena in their natural setting and protect them from developments and uses that would destroy the scenic beauty and natural character of the area, for the benefit, inspiration, education, recreation, and enjoyment of the public." The forested glacial hills and scenic beauty of Port Oneida help fulfill the National Lakeshore's purpose. Also, Port Oneida's significance is included in the 2009 GMP: "The collection of historic landscapes—maritime, agricultural, and recreational—in the National Lakeshore is of a size and quality unsurpassed on the Great lakes and rare elsewhere on the United States' coastline."

Port Oneida is a resource that is key to the cultural integrity of the park and is considered a fundamental park resource in the 2009 GMP.

The Preferred Alternative provides direction for stabilizing existing or reestablishing missing patterns of field and forest and protecting existing historic vegetation through removal of non-historic (and often invasive) vegetation. The alternative provides a general framework that will allow flexibility in applying techniques for removing and disposing of non-historic vegetation and maintaining the desired vegetation. This alternative will also permit the National Lakeshore to respond positively to compatible future proposals for using the farms.

There are four general types of mechanical vegetation removal that may be employed: mowing, cutting, pulling, and pruning. Many of these activities are more intense at the onset of field clearing, and then less so as the operations evolve into routine field maintenance. During field clearing activities there would be a minor disruption of the historic scene. Prescribed fire, if employed, would also disrupt the historic scene during burning and with the blackened landscape until the next growing season. Intense fires could cause cracked shards. Herbicide application would change the historic scene by killing targeted vegetation. Cultivation, a treatment option that includes cover crops, row crops, orchards, and permanent pastures, would provide opportunities to display activities that once occurred at Port Oneida and landscape patterns authentic to an agricultural landscape.

If, during landscape rehabilitation or maintenance activities, previously undiscovered archeological resources are discovered, all work in the immediate vicinity of the discovery will be halted until the resources can be identified and documented, and an appropriate mitigation strategy developed, if necessary, in consultation with the Michigan SHPO.

The Preferred Alternative would not result in an impairment of cultural resources. Impacts would be long-term, moderate, and beneficial.

Water Resources

All waters within the designated boundaries of the National Lakeshore are considered high quality waters that are designated as outstanding state resource waters (OSRW) by the State of Michigan (NPS 2002). There is a large wetland central to the Port Oneida area and other smaller wetland areas. The only other surface waters in the area are found in Narada Lake and Lake Michigan. There are two major aquifers represented in the National Lakeshore. Material deposited during the Pleistocene glacial advances comprises the surficial aquifer system. This system is hydraulically connected to streams because of its shallow depth, ease of recharge via precipitation, and short groundwater flow paths.

Although not specifically mentioned in the park's purpose, water resources are a key natural resource and are described in a significance statement in the 2009 GMP: "The National Lakeshore preserves outstanding scenic and publicly accessible resources. Its massive glacial headlands, expansive Lake Michigan beaches, diverse habitats, *superb water resources* [italics added], and rich human history offer an exceptional range of recreational, educational, and inspirational opportunities." Also, water resources are a key component of Port Oneida, which is a fundamental park resource.

Activities proposed in the Preferred Alternative may directly impact water resources from surface disturbances that could or can cause erosion (mechanical removal), ash (prescribed fire), and chemicals from the application of herbicides. It includes active agriculture that can create wind and water erosion and sedimentation (until vegetative growth occurs), and contamination from herbicides, fertilizers, and

animal waste.

Impacts to groundwater from herbicide leaching would be minimized by proper selections of herbicides for use in wet areas, as applicable. Impacts to groundwater by oil leakage from heavy equipment would be minimized by routine maintenance.

The Preferred Alternative would not result in an impairment of water resources. Impacts would be long-term, minor, and adverse.

Vegetation

Port Oneida has a range of native and naturalized plant species, non-native plant species, and domesticated plantings that establish its rural agricultural character. As woodlands, the native and naturalized species primarily occur on the forested hillsides and wooded bluffs that surround the agricultural fields and farmsteads, and also in the large emergent wetland in the center of Port Oneida. Non-native plant species include domesticated plantings as well as weedy species that are encroaching into the open fields and hardwood forests. Black locust trees were historically planted to provide wood for fence posts and wagon tongues. The trees have become invasive, expanding into fields and hillsides, most notably on the forested moraine and fields behind the Charles Olsen farm and the Port Oneida schoolhouse.

The project area occurs within the Great Lakes section of the Hemlock-White Pine-North Hardwoods Region. The original hardwood and hemlock-hardwood forests were dominated by sugar maple, beech, yellow birch, basswood, and eastern hemlock. Once these forests were cut for lumber and farming, secondary forests often included a predominance of both quaking aspen and big-tooth aspen. The original pine forests in the region were dominated by white pine, red pine, and jack pine.

The vegetative landscape in Port Oneida is dominated by inactive farm fields, forested morainal hills and wetlands. Old fields in Port Oneida are dominated by smooth brome. They are being overtaken by early successional species such as black cherry, red pine, and exotic plants such as black locust and spotted knapweed.

A large, mixed scrub-shrub and emergent wetland is found central to Port Oneida. Dominant species include northern white cedar, larch, and speckled alder.

Vegetation is generally included in the park's purpose statement, "Preserve outstanding natural features, including forests,…," and in three of the four significance statements. Also, vegetation is a key component of Port Oneida, which is a fundamental park resource.

Activities proposed in the Preferred Alternative may directly impact vegetation by direct removal and crushing due to foot and heavy equipment traffic. Indirectly, vegetation may be impacted by the introduction of invasive seeds onto disturbed sites, invasive seed introduction from "dirty" equipment, alterations in soils resulting in changes to vegetation, and removal of "edge" species. Prescribed fire, should it be employed, would result in the direct loss of vegetation and, indirectly, a reduction in nesting, resting, and foraging habitat for birds and small mammals. Herbicide application can result in a hundred-percent kill, often affecting non-target plants. Active agriculture that can create wind and water erosion and sedimentation (until vegetative growth occurs), and contamination from herbicides, fertilizers, and

animal waste.

A number of mitigation measures will be implemented:

- Conifers will not need to be pulled, because they will not re-sprout. Cutting with a chainsaw or clipping the smaller trees is sufficient. No herbicide is necessary.
- No pulling of stumps or trees in areas with steep slopes will be permitted. These sites have the greatest chance of causing erosion or loss of topsoil.
- No pockets of sand or holes will remain after trees are pulled.
- For deciduous trees, to prevent re-sprouting by pulled stumps, roots will be removed to the extent possible. It is likely impossible to collect all of the root system on the larger trees. Treatment with herbicide may also be needed at these sites. For best results with less disturbance, only the smaller trees (6-10" DBH, depending on species) will be pulled. Larger diameter trees will be flush cut.

The Preferred Alternative would not result in an impairment of vegetation. Impacts to non-invasive native vegetation would be short-term, minor, and adverse. Impacts to native and non-native invasive vegetation would be long-term, moderate, and adverse.

Wildlife

Approximately 21 species of amphibians, 19 species of reptiles, and 45 species of mammals have been reported in the park. Common amphibians include American toad, gray tree frog, green frog, wood frog, and red-backed salamander. Common reptiles are northern water snake, common garter snake, eastern box turtle, and midland painted turtle. Frequently observed mammals include American beaver, Virginia opossum, meadow vole, red squirrel, striped skunk, and white-tailed deer.

159 species of birds were recorded as breeding in Leelanau County during the 1983 to 1988 survey. Approximately 250 species of birds have been observed within the park. Some of the common breeding birds include Cooper's hawk, mourning dove, downy woodpecker, black-capped chickadee, red-breasted nuthatch, red-eyed vireo, hermit thrush, magnolia warbler, pine warbler, red-winged blackbird, song sparrow, and white-throated sparrow.

Wildlife is not specifically included in the park's purpose statement, but wildlife is a key component of Port Oneida, which is a fundamental park resource. Wildlife is mentioned in the following significance statement from the 2009 GMP: "The National Lakeshore's native plant and animal communities, especially the northern hardwoods, coastal forests, dune communities, and interdunal wetlands, are of a scale and quality that is rare on the Great lakes shoreline. These relatively intact communities afford an opportunity for continuation of the ecological processes that have shaped them."

Depending upon the time of the activity, activities proposed in the Preferred Alternative may directly impact wildlife during field clearing activities, since wildlife that cannot escape may be killed. All wildlife in the vicinity of removal activities will be harassed, and nesting sites, resting sites, and foraging habitat may be removed. Displaced wildlife may experience increased predation. Indirectly, forest edge areas may be removed (resulting in loss of habitat) and increased sedimentation to surface waters may affect aquatic wildlife functions. Prescribed fire, should it be employed, would result in the direct loss of vegetation and, indirectly, a reduction in nesting, resting, and foraging habitat for birds and small mammals. Direct mortality is unlikely for aquatic wildlife during any prescribed fires, but some terrestrial wildlife would be killed. With herbicide application, it is unlikely that most wildlife would

receive direct exposure. Most would fly or run away, or burrow. The conversion of a diverse vegetative species to a monoculture (with cover or row crops) would indirectly impact wildlife by altering their habitat. Cultivation, which includes cover crops, row crops, orchards, and permanent pastures, results in direct mortality and displacement, as well as habitat loss and habitat degradation. Deer populations would increase and their habits would be altered. Grassland bird populations would likely decrease. Pasturing could introduce potential disease issues and fences may impact wildlife migration.

Mowing and prescribed burning (if implemented) activities will be timed to reduce impacts to nesting birds.

The Preferred Alternative would not result in an impairment of wildlife. Impacts would be long-term, minor, and adverse.

Species of Special Concern

In the summer of 2002, an assessment of historic open lands (fields) was conducted at the park. Observations in the Thoreson field area included the five following bird species of "conservation priority" by the U.S. Fish and Wildlife Service (USFWS): northern harrier (*Circus cyaneus*), field sparrow (*Spizella pusilla*), grasshopper sparrow (*Ammodramus savannarum*), bobolink (*Dolichonyx oryzivorus*) and eastern meadowlark (*Sturnella magna*). It is likely that these species, which are protected by the Migratory Bird Treaty Act of 1918, would be found in all fields in Port Oneida.

Species of Special Concern is not specifically included in the park's purpose statement, but wildlife is a key component of Port Oneida, which is a fundamental park resource. And, wildlife is mentioned in one of the four significance statements in the 2009 GMP.

Species of special concern may be directly and indirectly impacted by mechanical removal, prescribed fire, and herbicide application. During field clearing activities, species that cannot escape may be killed. All species in the vicinity of removal activities will be harassed, and nesting sites, resting sites, and foraging habitat may be removed. Displaced species may experience increased predation. Indirectly, forest edge areas may be removed, resulting in loss of habitat. Prescribed fire, should it be employed, would result in the direct loss of vegetation and, indirectly, a reduction in nesting, resting, and foraging habitat for these species. With herbicide application, it is unlikely that most species would receive direct exposure, especially if application were timed to avoid nesting periods. Most would fly away. The conversion of a diverse vegetative species to a monoculture (with cover or row crops) would indirectly impact species by altering their habitat.

Mowing and prescribed burning (if implemented) activities will be timed to reduce impacts to nesting birds.

The Preferred Alternative would not result in an impairment to Species of Special Concern. Impacts would be short-term, negligible, adverse and long-term, moderate, and adverse.

Soils

Port Oneida's existing physical features were formed 11,000 years ago, during the Port Huron sub stage of the Wisconsin glacial stage, during which the retreating ice left behind the moraines, bluffs, drainage channels, and bays that characterize the Sleeping Bear Dunes region.

Following the glacial retreat, the low-lying areas in the region were covered by a series of prehistoric lakes; the first, known as Lake Algonquin, covered all of what later became Port Oneida. The high hills that remain were islands in the lake. The second and smaller Lake Nipissing disappeared within 700 years of the glacial retreat.

The thick layer of till left by the retreating glacier covers most of the Lakeshore's underlying bedrock. This rubble remains in the form of ridges and hills that terminate in steep bluffs near Lake Michigan. These bluffs eventually developed into perched dunes after prevailing westerly winds deposited sand form the bluffs on upland areas. Pyramid Point is an example of such a dune. Other topographical features created by glacial activity include the wetlands and small inland lakes that constitute a significant portion of Port Oneida.

Port Oneida's glacial legacy is most evident in its soils, which generally consist of coarsely textured, highly permeable subsoil. These soils have a reduced water holding capacity; any inherent or supplemented organic matter is continually leached away. Historically, this phenomenon limited agricultural productivity. Scattered pockets of more productive soil ("prime" soils) can be found in Port Oneida.

The Kalkaska-Mancelona association and the minor types comprising this soil profile support a variety of vegetation strongly correlated with the area's glacial and post-glacial geology. Native hardwood species once predominated, but through the years much of it was cleared—first through lumbering, and later through the development of farms and orchards. Despite many disturbances, soils in Port Oneida are in good condition.

Soils are mentioned indirectly in the park's purpose statement ("…, and ancient glacial phenomena…") since they are related directly to glaciation. Also, soils are a key component of Port Oneida, which is a fundamental park resource.

Soils may be directly impacted during field clearing activities and soil profiles would be disturbed due to compaction and ruts from heavy equipment and from pulling tree stumps. Historic contours would be altered during any grading activities, particularly when filling holes left by removed tree stumps. Soils could be contaminated from chemical spills from heavy equipment, chainsaws, and other motorized equipment. Once vegetation is removed, soils would be more susceptible to wind and water erosion. Oxygen in soils would be depleted under any wood piles. Prescribed fire, should it be employed, would result in the loss of vegetation, making soils more susceptible to wind and water erosion. Burning vegetation would increase nutrient availability. If wood piles are burned, soils under them could become sterile. Herbicide application has the potential to persist in soils, which would lead to herbicide buildup in soils. Coarse to medium-textured soils, like many of the soils in Port Oneida, are less likely to retain herbicides than medium and fine-textured soils with higher organic matter content. Cultivation, which includes cover crops, row crops, orchards, and permanent pastures, can disturb upper soil profiles, create wind and water erosion (until vegetative growth occurs), cause nutrient depletion, and can result in contamination from herbicides, fertilizers, and animal waste.

A number of mitigations measures will be implemented:

- There should be no pockets of sand or holes remaining after trees are pulled.
- For less soil disturbance, only smaller trees (6-10" DBH, depending on species) will be pulled and larger diameter trees would be flush cut.

- To reduce resprouts of deciduous trees, they will be girdled and/or basal treated, trees left standing, and cut down the following year. Trees will be treated with herbicide the first year. This method has the least amount of initial and long-term soil disturbance.
- The next best alternative is to cut trees with chainsaws and stump treat. This treatment will have much less soil disturbance compared to pulling the trees. There may be a chance of re-sprouting with this treatment.
- Impacts to soils from equipment oil leakage would be minimized by routine equipment maintenance.
- Soils leaching would be minimized by careful selection, mixing, transport, and storage of herbicides.
- Disturbed soils would be revegetated as soon as possible to minimize wind and water erosion.
- Use of heavy equipment would be limited in wet conditions.

The Preferred Alternative would not result in an impairment to soils. Impacts would be long-term, minor, and adverse.

Appendix B-2. General Recommendations for Maintaining Landscape Features

Stabilizing and perpetuating historic landscape features, primarily intentionally planted vegetation, in Port Oneida is another primary objective of this alternative. This alternative outlines a program of routine preservation maintenance for landscape features. The landscape features that contribute to Port Oneida's historic significance and establish its integrity as a rural historic district are windbreaks and tree rows, fence lines, fruit orchards, and remnant ornamental vegetation. The general recommendations are grouped by feature type and the fields with these associated features are noted (field number in parentheses).

Windbreaks and Tree Rows:

Conifer rows that were planted to provide buffer from wind and snow will be retained if they date to the period of significance (1870-1945). Non-historic windrows that currently protect roadways from snow deposition may need to be replaced seasonally with some other non-intrusive barrier. Although the windbreaks typically include red pine, white pine, or Norway spruce, some are mixed pine. The goal for managing these features is to protect individual trees as much as possible. If trees are declining and gaps appear, coniferous seedlings should be allowed to mature in the mixed pine, red pine, and white pine windbreaks. It is preferable to keep the original character of the row: if mixed, either red or white pine seedlings should be allowed to mature, if row is red pine, allow red pine seedlings to mature, and if the row is white pine, allow white pine seedlings to mature. Deciduous shrub and tree seedling growth should be removed to keep a defined edge between the tree row and the adjacent field. Tree rows will be preserved as they were historically with a simple line of trees.

Deciduous tree rows in Port Oneida are almost exclusively sugar maples that were planted along roads in the 1910s and 1920s. There are approximately 150 sugar maples that contribute to the historic landscape. They are in relatively good condition, considering their age and proximity to roads. The primary problem is dead and hazard limbs. The most noticeable sugar maple rows are found along M-22 near the Charles Olsen Farm (#6), along the Port Oneida Road near the cemetery and Kelderhouse Farm (#8), and along Basch Road near the Peter Burfiend Farm (#12).

It is probably impractical to undertake an aggressive program of mulching, fertilizing, watering, and pruning this number of mature trees. Given the visibility of the trees, however, an attempt should be made to more actively manage them. In concert with the National Lakeshore's *Hazard Tree Removal Criteria*, an agreement between the NPS, the Leelanau County Road Commission, and a certified arborist could allow for periodic inspection for pest and disease and removal of dead and hazard limbs. Tree removal is a last resort, but in cases of visitor and staff safety, it is sometimes necessary. An arborist can help decide whether or not a tree should be removed and have the skills and equipment to safely and efficiently remove trees. Removal is recommended when a tree:

- Is dead, dying, or considered irreparably hazardous.

– Is causing an obstruction, or is crowding and causing harm to other trees and the situation is impossible to correct through pruning."[1]

When a single tree in a row dies, it does not have to be immediately replaced and may be replaced later. To maintain the uniformity of the row's appearance, if more than three trees in a row are dead, they should be replaced all at once.

Pruning mature trees: Routine pruning to remove weak, diseased or dead limbs can be accomplished at certain times during the year with little effect on the tree. As a rule, growth is maximized and wound culture is fastest if pruning takes place before the spring growth flush. Some trees, such as maples and birches, tend to 'bleed' if pruned early in the spring. This may be unsightly, but is of little consequence to the tree. Heavy pruning just after the spring growth flush should be avoided. This is when trees have just expended a great deal of energy to produce foliage and early shoot growth. Removal of a large percentage of foliage at this time can stress the tree.

Proper pruning cuts should be made just outside the branch collar. The branch collar contains trunk or parent branch tissue and should not be damaged or removed. If the trunk collar has grown out on a dead limb to be removed, make the cut just beyond the collar. Do not cut the collar. If a large limb is to be removed, its weight should be reduced to lessen the chance of cracking or breaking. An undercut about 12-18 inches from the limb's point of attachment is followed by a second cut made from the top.

If the crown of the tree needs to be reduced for utility lines, do not top the tree. Reducing the height or spread of the tree is best accomplished by pruning back the leaders and branch terminals to lateral branches that are large enough to assume the terminal roles. This helps maintain the form and structural integrity of the tree.

Mowing: In addition to their contribution to historic landscape character, tree rows and hedges can provide wildlife habitat. Allowing grass and low woody growth within the row is beneficial for a number of reasons. It helps control water runoff by slowing it down and allowing it to filter into the soil, reduces loss of sandy soils, and moderates wind and soil moisture loss. Other benefits of providing food, shelter and nesting areas for deer, birds and insects in tree rows include greater species diversity, nuisance pest control by birds and improved pollination and pest management by beneficial insects.[2] While large shrubs and small trees should be removed from the edge of both conifer windbreaks and deciduous tree rows to maintain character, the spaces within the rows and between trees should not be mown except to control invasive plants or in cases of visitor or staff safety.

[1] From the International Society of Arboriculture website for "Mature Tree Care," http://www.treesaregood.com/treecare/mature_care.aspx.
[2] From Ebey's Landing National Historical Reserve website, http://www.nps.gov/ebla/hedgerows.htm.

Fence lines:

Maintaining existing fence posts and replacing missing posts in open meadows and active agriculture plots (described in the following section) will also help recapture the historic appearance of the agricultural landscape. Replace existing posts as needed where there is evidence of a prior fence. When a fence is replaced, it will encompass as much of the original fence's extent as can be determined using visual evidence and documentation from the 1938 aerial photographs.

Orchards:

At least thirteen remnant orchards can be found in Port Oneida. Most are associated with a farmstead; several are located in fields near farms that are no longer extant. For purposes of the Lakeshore's maintenance program, these "orphan" orchards are addressed along with the recommendations of the surrounding field. As mentioned above, orchards play an important role in defining landscape character and interpreting the agricultural history of the district. They also represent genetic material that is rapidly being lost in the commercial fruit market. Given the recent interest in heirloom varieties, these trees should be managed to perpetuate not only the historic form of the orchards, but to also protect the genetic databank they represent. Many heirloom varieties have become very rare. Because many of the trees in Port Oneida have yet to be identified it is important to partner with a specialist to determine which varieties are present in the district.[3]

Managing Port Oneida's fruit trees to promote a healthy lifespan is the intent of these recommendations; quality fruit production is a less important concern. In the future, a program of grafting to continue genetic lines is recommended, and new trees could be planted in place of dead trees to fill gaps in the orchard pattern. When such a program becomes feasible, individual orchard management plans should be developed. At present, the maintenance regime will consist of periodic pruning and mowing. If possible, the trees should be fertilized and watered.[4]

> **Pruning:** focus on removing all dead wood every spring. It is important to make only one or two cuts per season, in the early spring, and that the cuts are made in a way that will promote a stable tree structure. If new cuts are made, it is important that the pruning be continued on a regular basis. Trees are harmed if cut one season and then neglected for several years. By sticking to the removal of dead wood, the National Lakeshore can preserve the trees until an orchardist/arborist can be hired or a partner identified to insure continuity of care. If a decision is made to more actively manage an orchard (i.e. pruning to reestablish historic shape by removing competing leaders, water sprouts, crossing limbs, etc.), an arborist or extension agent with special training in historic orchard management should be consulted. When the National Lakeshore is ready to take on long term orchard management, new trees can be planted. Appropriate varieties grafted on standard rootstock should be pruned in an historically accurate style.

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[3] See Appendix X for a tentative list of varieties found in Port Oneida. These trees were identified by retired Chief of Interpretation Neal Bullington. For guidance on historic orchards, please reference "A Fruitful Legacy: A Historic Context of Orchards in the United States, with Technical Information for Registering Orchards in the National Register of Historic Places," National Park Service: Washington DC, 2009.

[4] Following a nutrient analysis, an appropriate fertilizer or compost should be applied along the drip line. By making a hole with a pole prior to application, the fertilizer will be more readily absorbed by the roots.

Mowing: recommended once a year, preferably in the fall, to reduce competition for water and discourage pests. A minimum 25' buffer should be established between orchards and nearby forests. Another option to control growth of grasses and woody species is controlled grazing.

Lilacs:

These historically significant and highly visible features are most noticeable at the former Port Oneida Dock Site (#9), but are also located at most farmsteads and along Basch Road. Promote healthy growth of lilacs by removing dead wood and old thick stems. Prune after flowering in May-June and mow around perimeter to allow for air movement through the plant. If possible, apply a good, all-purpose fertilizer.

Roses and other Ornamental or Domestic Plant Species:

Promote healthy growth by mowing perimeter of the planting area and removing dead stems and other encroaching woody vegetation. If possible, apply a good all-purpose fertilizer. Based on further site development plans that will be completed as new adaptive uses are identified for individual farms, domestic vegetation may be replaced in kind or reestablished.

Appendix B-3. November 4, 2010 Public Scoping Letter

United States Department of the Interior

NATIONAL PARK SERVICE
Sleeping Bear Dunes National Lakeshore
9922 Front St. (Hwy M-72)
Empire, Michigan 49630-9797

IN REPLY REFER TO:

November 4, 2010

L1617(SLBE)

Dear Friends:

The National Park Service has begun the process of planning how to best manage the cultural landscape of the Port Oneida Rural Historic District. To do so, we will prepare a Cultural Landscape Management Plan (Plan) and an associated Environmental Assessment (EA) for the Port Oneida Rural Historic District (District) in Sleeping Bear Dunes National Lakeshore (National Lakeshore). The purpose of the Plan/EA is to explore the various ways in which the NPS might preserve cultural landscapes in the District in order to protect cultural resources and provide for visitor interpretive and recreational opportunities.

The District is representative of the late 19th and early 20th century farms of the Midwest. The 18 farms, 113 structures, and 3,400 acres constitute one of the largest intact agricultural districts in the National Park System. Because of its size, integrity, and potential for preservation, it is listed on the National Register of Historic Places at the state level of significance and has been suggested as potentially being of national significance by the Michigan State Historic Preservation Office. The entire District is included within the "Experience History" zone in the 2009 Lakeshore General Management Plan, which is managed primarily to preserve historic structures and landscapes.

The District provides an excellent opportunity to preserve a rapidly disappearing landscape associated with an important time period in the heartland of America. The potential exists for National Lakeshore visitors to continue to explore this American farm landscape for both educational and recreational activities.

The Plan/EA is needed to determine the best way to halt deterioration of the cultural landscape, and preserve it on into the future. Since the end of agricultural activity in Port Oneida, historic spatial patterns have deteriorated somewhat. The physical and visual connections between landscape features, agricultural buildings, and community landmarks have diminished, and much of the historic plant materials have been lost. Landscape features such as windbreaks, orchards, and garden areas are deteriorated and overgrown. Invasive vegetation, such as black locust and spotted knapweed, has encroached on the landscape and threatens native plant and animal communities. Although National Lakeshore staff and volunteers have accomplished much to halt and reverse this deterioration, we need to decide the desired future conditions for the District, and how best to achieve them.

The Plan/EA process is just beginning and we welcome your ideas on the future of the District. We are especially interested in how you envision the landscape looking many years from now. Will some fields be allowed to return to mature forest? Will some fields be cultivated or planted with cover crops? We also need your ideas on what impacts and issues we should consider as we begin this planning effort. How might decisions about the fields impact the natural and cultural resources in and around the District? Please provide your ideas electronically through a link on the National Lakeshore's website at www.nps.gov/slbe. Comments may also be mailed to the National Lakeshore (Superintendent, Sleeping Bear Dunes National Lakeshore, 9922 Front Street, Empire, MI 49630).

We request that you provide your comments to us by December 10, 2010. The comments you submit during this "scoping" phase of planning will be incorporated into a range of alternatives and impact analyses in the Plan/EA. The Plan/EA will then be made available for further public review and comment, scheduled for release early next summer, when we will again solicit your input.

If you have any questions on this project, please call us at (231) 326-5134.

Sincerely,

Dusty Shultz
Superintendent

Appendix B-4. November 8, 2010 Press Release

NNational Park Service
U.S. Department of the Interior

Sleeping Bear Dunes
National Lakeshore

9922 Front Street
Empire, Michigan 49630

213-326-5134 phone
231-326-5382 fax

Sleeping Bear Dunes National Lakeshore News Release

November 8, 2010
For Immediate Release
Contact: Michael Duwe, 231-326-5134

Port Oneida Landscape Management Plan/Environmental Assessment
Sleeping Bear Dunes National Lakeshore

Empire, MI - Superintendent Dusty Shultz has announced that the National Park Service has begun the process of planning how to best manage the cultural landscape of the Port Oneida Rural Historic District. To do so, the Sleeping Bear Dunes National Lakeshore (National Lakeshore) will prepare a Cultural Landscape Management Plan (Plan) and an associated Environmental Assessment (EA) for the Port Oneida Rural Historic District (District) in the National Lakeshore. The purpose of the Plan/EA is to explore the various ways in which the NPS might preserve cultural landscapes in the District in order to protect cultural resources and provide for visitor interpretive and recreational opportunities.

The District is representative of the late 19th and early 20th century farms of the Midwest. The 18 farms, 113 structures, and 3,400 acres constitute one of the largest intact agricultural districts in the National Park System. Because of its size, integrity, and potential for preservation, it is listed on the National Register of Historic Places at the state level of significance and has been suggested as potentially being of national significance by the Michigan State Historic Preservation Office. The entire District is included within the "Experience History" zone in the 2009 National Lakeshore General Management Plan, which is managed primarily to preserve historic structures and landscapes.

The District provides an excellent opportunity to preserve a rapidly disappearing landscape associated with an important time period in the heartland of America. The potential exists for National Lakeshore visitors to continue to explore this American farm landscape for both educational and recreational activities.

The Plan/EA is needed to determine the best way to halt deterioration of the cultural landscape, and preserve it on into the future. Since the end of agricultural activity in Port Oneida, historic spatial patterns have deteriorated somewhat. The physical and visual connections between landscape features, agricultural buildings, and community landmarks have diminished, and much of the historic plant materials have been lost. Landscape features such as windbreaks, orchards, and garden areas are deteriorated and overgrown. Invasive vegetation, such as black locust and spotted knapweed, has encroached on the landscape and threatens native plant and animal communities. Although National Lakeshore staff and volunteers have accomplished much to halt and reverse this deterioration, there is a need to decide the desired future conditions for the District, and how best to achieve them.

The Plan/EA process is just beginning and they welcome your ideas on the future of the District. The National Lakeshore is especially interested in how you envision the landscape looking many years from now. Will some fields be allowed to return to mature forest? Will some fields be cultivated or planted with cover crops? They also need your ideas on what impacts and issues they should consider as they begin this planning effort. How might decisions about the fields impact the natural and cultural resources in and around the District? Please provide your ideas electronically through a link on the National Lakeshore's website at www.nps.gov/slbe. Comments may also be mailed to the National Lakeshore (Superintendent, Sleeping Bear Dunes National Lakeshore, 9922 Front Street, Empire, MI 49630).

The National Lakeshore requests that you provide your comments to them by December 10, 2010. The comments you submit during this "scoping" phase of planning will be incorporated into a range of alternatives and impact analyses in the Plan/EA. The Plan/EA will then be made available for further public review and comment, scheduled for release early next summer, when they will again solicit your input.

For more information, please call the National Lakeshore at 231-326-5134 or visit our website at www.nps.gov/slbe.

-NPS/SLBE-

Appendix B-5. Public Comments Summary

April 12, 2011

PORT ONEIDA LANDSCAPE MANAGEMENT PLAN/ENVIRONMENTAL ASSESSMENT
PUBLIC SCOPING COMMENT SUMMARY

The National Park Service (NPS) at Sleeping Bear Dunes National Lakeshore (National Lakeshore) has begun the process of planning how to best manage the landscapes of the Port Oneida Rural Historic District (Port Oneida). To do so, the NPS will prepare a Landscape Management Plan (Plan) and an associated Environmental Assessment (EA). The purpose of the Plan/EA is to explore the various ways in which the NPS might preserve landscapes in Port Oneida in order to protect cultural and natural resources and provide for visitor interpretive and recreational opportunities.

On November 4, 2010, a letter was mailed to 81 federal, state, and local agencies, elected officials, groups, and interested individuals asking for ideas on the future of Port Oneida, especially on visions for how the landscape will appear many years from now. We also asked for ideas on what impacts and issues should be considered in this planning effort. Simultaneously, the letter was placed on the park's website (nps.gov/slbe) with a link to the NPS Planning, Environment, and Public Comment (PEPC) website, which allows the public to comment electronically. On November 8, 2010, a press release was distributed electronically to the 42 media outlets in the National Lakeshore's media database. The official public comment period ended on December 17, 2010.

As a result, we received 113 comments from the PEPC website, eight emails, and six handwritten or typed letters, for a total of 127 comments. These comments will help set the stage for the major topics that the Plan/EA will address. Public input will continue to be invaluable in developing a plan that will make a lasting difference in the long-term management of Port Oneida. We thank all who commented and look forward to your comments on the draft Plan/EA that is expected to be available for review in summer 2011.

A number of comments, particularly relating to trails development, are beyond the scope of this Plan/EA. The main purposes of this Plan/EA are to identify and delineate field boundaries and to describe the "desired future condition" of those fields. The Plan/EA will build on decisions made in the *2008 Port Oneida Environmental Assessment* (2008 EA) and the *2009 General Management Plan/Wilderness Study/Environmental Impact Statement* (2009 GMP). The 2008 EA proposed a visitor center (Kelderhouse), employee housing (Goffar), additional small parking areas in the vicinity of the Eckhert and Ole Olsen Farms on Basch Road and at the Carsten Burfiend Farm on Port Oneida Road, roadside pull-offs, landscape stabilization, and trail development. Trail development was envisioned as a mowed or soft-surfaced hiking trail connecting the Kelderhouse Farm with the Martin Basch Farm and the Carsten Burfiend Farm, and connecting with other existing hiking trails. The Leelanau Scenic Heritage Trail (now called the Sleeping Bear Heritage Trail) was also considered in preparation of this Plan/EA. The 2009 GMP designated all of Port Oneida an "Experience History" zone, meaning that it is managed primarily to protect historic structures and landscapes.

The topics addressed by the public in these comments have been organized into six major subject areas that broadly describe the nature of the contents:

Trails and Roads:

We received many comments about the need to expand horseback riding trails in the park, especially in Port Oneida. Commenters also mentioned associated facilities such as trail camps, water troughs, hitching posts, and toilet facilities, and emphasized the potential economic benefits of this activity on the area. Some commenters suggested combining horse and hiking trails, while others suggested that they be separated. The impact of new trails on the cultural landscape, particularly the Sleeping Bear Heritage Trail, were a concern, and one commenter suggested that the Bay View Trail not be used as part of the Sleeping Bear Heritage Trail. Many commenters strongly suggested trail surfaces more in keeping with the rustic nature of Port Oneida, specifically, no asphalt. Other suggestions included reestablishing historic transportation linkages in Port Oneida, creating a "history trail" where visitors could travel from farm to farm, limiting privately-owned vehicle use, and keeping Basch Road rustic.

Visitor Activities:

A number of commenters want Port Oneida used as "farmland, not as a static museum of a farmland community." One person stated that "Port Oneida lacks LIFE—farmers, children, animals, and crops." Many suggested living history or demonstration farms and it was suggested that some, but not all, be developed as such. There was a feeling that "opportunities for quiet contemplation" at rustic farmsteads was also important and some farmsteads should be stabilized only. Many believed that we should continue fostering use of the farmsteads by artists and writers. Creative partnerships for a number of activities were suggested, such as gardens, orchards, crops, a horse farm, honey bees, and gardening and pruning classes. More interpretation was suggested, including docent-guided tours, resident migration, the dock and shipping, historic archeology (the farmstead no longer standing), and Native Americans.

Developments:

Some commenters were very interested in an unstaffed visitor center in Port Oneida, while another suggested that the one in Empire was sufficient. Commenters suggested no new buildings in Port Oneida and developments, if necessary, should be sited out of public view. Parking lots, if developed, should have a gravel or grass surface, not asphalt, and one commenter suggested a single parking lot for all of Port Oneida. A number of commenters suggested increasing the number of signs and information kiosks.

Field Characteristics:

Comments ranged from returning Port Oneida to pre-human condition to developing crops. A few commenters mentioned removing buildings and allowing the fields to revert to forest. Most commenters, however, wished to see the fields remain. Mowing was mentioned as an economical method of doing this and leased agricultural use was suggested. One commenter mentioned that planting field crops was redundant, since they can be seen elsewhere, while another mentioned using older varieties of crops and animals. The impacts to the large wetland in the center of Port Oneida from beaver-caused flooding was a concern to one commenter. Others suggested that we maintain those landscape features that were present during the period of significance.

Lake Michigan Access:

Some commenters were concerned about the erosion occurring at Pyramid Point and at various other access sites in Port Oneida, such as near the Carsten Burfiend Farmstead. Some were pleased with the

new steps at the end of Lane Road, while others thought they were too formal. A number of equestrians wished to have access to the beach for riding or to "water their horses."

Other:

A number of other comments were provided on a variety of subjects. Included were concerns for long-term maintenance of Port Oneida and the need for a special fund, the impact of fire from burning fields or woodpiles, the recent cutting activities in advance of completing the plan, especially involving white pines and red pine rows.