

FINDING OF NO SIGNIFICANT IMPACT
PORT ONEIDA HISTORIC LANDSCAPE MANAGEMENT PLAN /
ENVIRONMENTAL ASSESSMENT
SLEEPING BEAR DUNES NATIONAL LAKESHORE

In compliance with the National Environmental Policy Act (NEPA), the National Park Service (NPS) has prepared an Environmental assessment (EA) to examine alternatives and potential environmental impacts associated with the proposal to implement landscape management treatments to preserve significant historic landscape characteristics of the Port Oneida Rural Historic District (Port Oneida). The EA proposes desired future resource conditions for the Port Oneida landscape and an array of historic landscape management treatments. Implementation of these historic landscape management treatments would result in meeting the desired future resource conditions for Port Oneida. The NPS proposes to implement these historic landscape management treatments on lands managed by the NPS. While this EA is intended only for lands managed by the NPS, the NPS will seek to work cooperatively with other landholders in Port Oneida who may wish to manage their property in a manner consistent with the goal of this EA.

Much as land practices and use changed, and the landscape of Port Oneida evolved throughout its period of significance, the EA does not propose to ‘freeze’ the Port Oneida landscape at a particular point in time. Rather, through the proposed landscape management treatments, the NPS seeks to preserve the sense of place that Port Oneida exhibits as a rural historic district. These treatments would support continued interpretation of the history of Port Oneida, whether through formal programs or informal visitor discovery, while also implementing sustainable management practices.

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, which signifies the need for the EA, is diminished integrity of design, setting, materials, workmanship, feeling, and association in the historic landscape; the qualities that make up historic integrity. The NPS seeks to prevent any further loss of integrity through the development and implementation of a historic landscape management plan.

This Finding of No Significant Impact (FONSI) and the EA constitute the record of the environmental impact analysis and decision-making process for the project. The NPS will implement the Preferred Alternative, to rehabilitate the historic landscape so that the period of significance (1870-1945), and the changes that occurred over that time period, are conveyed to visitors. The Preferred Alternative includes measures for protection of park resources and was selected after careful review of resource and visitor impacts and public comment.

Selection of the Preferred Alternative

This EA evaluated two alternatives to implement rehabilitation of the Port Oneida historic landscape; the No Action Alternative 1 (continue current management) and Alternative 2, the Preferred Alternative (landscape rehabilitation). Alternative 2 is the NPS Selected Alternative because it best meets the purpose and need for the project.

As described in the EA, this alternative strives to maintain the historic agricultural landscape so that the period of significance (1870-1945), and the changes that occurred over that time period, are conveyed to visitors. The landscape is not managed to portray a specific point in time. The broad patterns of agricultural activity represented in the Port Oneida landscape make it infeasible and inappropriate to restore the landscape to a particular point in time or to preserve it by “freezing” it in its current state. Not only have some buildings and landscape features been lost, but concerns about historic farming practices (e.g., potential to introduce invasive plants, soil depletion, and operational requirements) and the need to safely accommodate a range of visitor opportunities and activities rule out a return to full-scale agricultural activity.

This alternative presents an active program of removing vegetation to maintain or reestablish the historic boundary (or a semblance of the historic boundary) and configuration of fields while addressing natural resource concerns such as invasive plant management, wetland protection, and soil conservation. Field maintenance is one of the primary objectives for the landscape management plan, as it is critical for retaining large-scale spatial patterns in the landscape.

This 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 Sleeping Bear Dunes National (National Lakeshore) to respond positively to proposals for adaptively using the farms that are compatible with objectives for Port Oneida. The success of the partnerships already in place at two farms (Charles Olsen and Thoreson) demonstrates that it is possible to identify compatible new uses for the farms. The overall approach is to manage inherent landscape change, encourage compatible new uses for structures and outdoor spaces, and maintain fields in one or more of the desired future conditions so that Port Oneida’s appearance as a historic agricultural landscape continues. To support an active program of field maintenance, this alternative proposes establishing a range of landscape conditions throughout Port Oneida.

Based on public comment and further review by the NPS, Map #6 (Charles Olsen) has been revised. The entire forested ridge behind the Charles Olsen farm is now in Old Field Succession (the revised map is included in the Errata Sheet). Previously, part of this ridge was in Open Meadow. However, concerns about erosion, and the inability to mow due to steep slopes resulted in this change.

Mitigation Measures

The Preferred Alternative would predominately result in beneficial effects. In areas where there is potential for adverse impacts, the following mitigation measures are proposed. More will be developed in the future. Based on public comment and further review by the NPS, an additional mitigation measure generally addressing agricultural methods has been included.

- 1) If during vegetation removal previously unknown archeological resources are discovered, all work in the immediate vicinity of the discovery would be halted. The resources would be identified and documented, and an appropriate mitigation strategy developed, if necessary, in consultation with NPS archeologists and the SHPO. In the unlikely event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (25 USC 3001) of 1990 would be followed. All human remains, funerary objects, sacred objects, or objects of cultural patrimony would be left in situ until the culturally affiliated tribe(s) was consulted and an appropriate mitigation or recovery strategy developed.

- 2) Conifers do not need to be pulled because they will not re-sprout. Flush cutting with a chainsaw or clipping the smaller trees is sufficient. No herbicide is necessary.
- 3) No pulling of stumps or trees in areas with steep slopes. These sites have the greatest chance of causing erosion or loss of topsoil.
- 4) There should be no pockets of sand or holes left after trees are pulled.
- 5) For deciduous trees, to prevent re-sprouting from stump remnants, remove as many of the roots as 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, pull only the smaller trees (6-10" DBH, depending on species).

- 6) Ideally, for treatments to have the least amount of re-sprouts, the best action would be to:

Girdle and/or basal treat, leave trees standing, and cut them down the following year. Make sure to treat with herbicide the first year. This treatment seems to have the best results. The more disturbance there is to a tree or site, the more it is likely to send up new sprouts. 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. If this method is used, it should only be used on smaller trees (no larger than 6-10" DBH depending on species).

- 7) Impacts to soils from equipment oil leakage would be minimized by routine equipment maintenance.
- 8) Soils leaching would be minimized by careful selection, mixing, transport, and storage of herbicides.
- 9) Disturbed soils would be revegetated as soon as possible to minimize wind and water erosion.
- 10) Use of heavy equipment would be limited in wet conditions.
- 11) Holes remaining after stumps are pulled would be filled immediately for safety, especially during mowing operations.
- 12) Impacts to groundwater from herbicide leaching would be minimized by proper selections of herbicides for use in wet areas, as applicable.
- 13) Impacts to groundwater by oil leakage from heavy equipment would be minimized by routine maintenance.
- 14) The National Lakeshore strives to reduce emissions in this project by using bio-lubricants and bio-fuels where possible, recycling materials (e.g., wood piles converted to woodchips for use on park trails and for landscaping), and using hybrid vehicles for activities relating to this project, using handsaws and other non-motorized equipment when possible. In addition, eco-friendly herbicides will be used (when needed) and all precautions will be taken to prevent the spillage of herbicides and oil from heavy equipment.

- 15) For any agricultural leases, certified organic production systems would be encouraged, although not required. Non-certified organic production systems would be expected to operate in the same general part of the sustainability spectrum.

The following practices have been recommended by Michigan Department of Natural Resources for managing and maintaining the opens fields in the National Lakeshore. These practices will be considered and used to the extent possible, while allowing for agricultural use.

- 1) Grasslands, including cool season grasses and hayfields, should be mowed between July 15 and August 31. This will reduce the chance of destroying bird nests, and discourages the invasion of problem grass species that move in after late season mowing. Cutting height should be about 6 inches. *Note: This date works for all grassland bird species of concern.
- 2) Fragmenting existing grassland areas should be avoided. If hiking trails are to be developed, they should be located at the edges of a field. Hedgerows that may serve as predator perches should be avoided.
- 3) Planting or maintaining several types of grasslands is recommended. A mosaic of tall and short grass fields will provide habitat diversity. A mixture of warm season grasses with forbs is best. Cool season grasses mixed with legumes is a second choice.
- 4) Warm season grasses are the most productive of cover types for grassland birds. Big and little bluestem, Indiangrass, and switchgrass are examples of warm season prairie grasses, which grow most rapidly during summer's peak when warm nights follow hot days. Warm season grasses are considered the most productive because these prairie grasses stand up well to snow and they provide thermal cover for roosting birds and other wildlife.
- 5) Prescribed burns may be used to increase the productivity of warm season grasses in particular. Burns should be conducted in early spring (March or April) or late fall (October or November).
- 6) One-hundred-foot shrub buffers next to forest edges and human habitations help to reduce the harsh edge. An alternative to planting shrubs along the edge of a forest is to allow the fire to burn slowly into the woods so as to create a "feathered" edge.
- 7) Chemical treatments of grasslands can also be used to control woody plants. Herbicides can be used to control any type of undesirable plants in the grassland, from wood plants to grasses and weeds.
- 8) Reducing or eliminating the use of insecticides will provide more valuable insect food for birds.

Alternatives Considered

Two alternatives were evaluated in the EA: the no-action alternative and one action alternative. Under Alternative 1, No Action, the National Lakeshore would continue landscape stabilization and rehabilitation under current management plans. 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 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.

Field maintenance activities to remove encroaching native and non-native woody vegetation in fields and important viewsheds are accomplished in an ad hoc manner as funding is available. Much of this field maintenance consists of mowing on a periodic schedule. Clearing activities have been implemented during the past five years on fields that are adjacent to roads travelled by many park visitors, and/or considered to have high opportunities for recreational 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 (with and without herbicide application), cutting (with and without herbicide application), and pulling. Brush piles created from these activities are chipped (chips used for park projects) or hauled off site. Burning of piles is a possibility under an approved burn unit plan.

Alternative 2, rehabilitate the historic landscape, is the Preferred Alternative, as described in the previous section.

Environmentally Preferable Alternative

The Preferred Alternative (the selected alternative) is the environmentally preferable alternative. The environmentally preferable alternative is determined by applying the six criteria suggested in §101 of NEPA. According to these criteria, the environmentally preferable alternative should 1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations; 2) assure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings; 3) attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences; 4) preserve important historic, cultural and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice; 5) achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and 6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources. Generally this means the alternative that causes the least damage to the biological and physical environment. It also means the alternative that best protects, preserves, and enhances historic, cultural, and natural resources (Council on Environmental Quality 1981).

The Preferred Alternative, Alternative 2 (the selected alternative) would provide a comprehensive method of addressing the objectives listed in the EA. Field boundaries would be identified, recommendations for stabilizing, maintaining, or restoring historic biotic features would be developed, an array of "desired future conditions" would be developed and applied to fields, and a list of techniques or treatment options that may be applied to reach the desired future condition would be created. Implementation of these objectives would establish a range of landscape management treatments throughout Port Oneida that best portray the evolution of rural life and farming activities with secondary consideration to the preservation of natural resources.

Why the Preferred Alternative Will Not Have a Significant Effect on the Human Environment

As defined in 40 CFR §1508.27, significance is determined by examining the following criteria:

1. Impacts that may be both beneficial and adverse. A significant effect may exist even if the federal agency believes that on balance the effect will be beneficial:

No long-term major adverse or beneficial impacts were identified that require analysis in an Environmental Impact Statement.

The selected alternative will result in short and long-term impacts to the environment. Impacts to cultural resources will be long-term, moderate, and beneficial. Impacts to water resources will be long-term, minor, and adverse. Impacts to vegetation will be short-term, minor, and adverse (for non-invasive native vegetation) and long-term, moderate, and adverse (for native and non-native invasive vegetation). Impacts to wildlife will be long-term, minor, and adverse. And, impacts to species of special concern will be negligible in the short-term and moderate and adverse in the long-term.

2. The degree to which the proposed action affects public health or safety:

The selected alternative would have little impact on public health and safety. Visitor access to certain areas would be restricted during mechanical vegetation removal, prescribed fires, or herbicide application.

3. Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas:

Port Oneida is a unique area that includes 19 farms and over 100 buildings, sites, and structures. NPS research indicates that Port Oneida is the largest and most complete historic agricultural landscape in public ownership in the U.S. Included in the historic district are prime soils, wetlands, an inland lake, and Lake Michigan shoreline. Impacts to cultural resources in the project area will be long-term, moderate, and beneficial. Prime farmlands will be considered for active agriculture in the future and impacts to them may be long-term, minor, and adverse. Any areas of prime farmland soils will be carefully analyzed in concert with the National Resource Conservation Service, Leelanau Conservation District, or other specialists prior to commencement of active agriculture. Impacts to wetlands and other water resources in the project area will be long-term, minor, and adverse. There are no wild and scenic rivers or designated ecologically critical areas within the project area.

4. The degree to which the effects on the quality of the human environment is likely to be highly controversial:

There were no highly controversial effects identified during either the preparation of the EA or during the public review period.

5. Degree to which the possible effects on the quality of the human environment are highly uncertain or involve unique or unknown risks:

There were no highly uncertain, unique, or unknown risks identified during either the preparation of the EA or during the two public review periods.

6. Degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration:

The selected alternative neither establishes a National Park Service precedent for future actions with significant effects nor represents a decision in principle about a future consideration.

7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts:

Other past, present, and reasonably foreseeable future management activities at the National Lakeshore and in the surrounding region include: M-22 Scenic Heritage Route designation (completed), Glen Haven Village improvements (completed), Sleeping Bear Heritage Trail (underway), improvements to the Port

Oneida Historic District (2008 EA) (future), and Lake Michigan overlooks improvements—Pierce Stocking Scenic Drive (future).

Long-term adverse impacts will occur to water resources, vegetation (invasive native and non-native), wildlife, species of special concern, soils, and park facilities and operations. Other past, present, and reasonably foreseeable future actions are expected to contribute very little to adverse impacts to these resources because they are almost exclusively in previously-disturbed areas and many are some distance from Port Oneida. Long-term beneficial impacts will occur to cultural resources and visitor use and experience. Other past, present, and reasonably foreseeable future actions are expected to add minor to moderate beneficial impacts to this project, since they all relate either directly or indirectly to it.

8. Degree to which the action may adversely affect districts, sites, highways, structures, or objects listed on National Register of Historic Places, or may cause loss or destruction of significant scientific, cultural, or historical resources:

The selected alternative will not adversely affect any resources listed on, or eligible for, the National Register of Historic Places, nor will it impact any other significant park resources. The purpose of this project is to rehabilitate the historic landscape at Port Oneida through a variety of actions described in the EA. Implementation of the selected alternative would result in long-term, moderate, and beneficial impacts.

The Michigan State Historic Preservation Office (SHPO) was consulted and in general concurred with this finding in a letter dated October 13, 2011.

9. Degree to which the action may adversely affect an endangered or threatened species or its critical habitat:

Section 7 of the Endangered Species Act requires federal agencies to consult with U.S. Fish and Wildlife Service (USFWS) when any activity permitted, funded, or conducted by that agency may affect a listed species or designated critical habitat, or is likely to jeopardize proposed species or adversely modify proposed critical habitat. The USFWS has identified three threatened and endangered species within the National Lakeshore: endangered piping plover (*Charadrius melodus*), endangered Michigan monkey flower (*Mimulus glabratus* var. *michiganensis*), and threatened Pitcher's thistle (*Cirseum pitcheri*). Additionally, the breeding range of the Indiana bat (*Myotis sodalist*) occurs within the southern half and western coastal counties of the Lower Peninsula of Michigan, including Benzie and Leelanau Counties. However, even with suitable habitat in the National Lakeshore (highly variable forested landscapes in riparian, bottomland, and upland areas that have roosting trees with crevices or exfoliating bark), this species has not been confirmed within the National Lakeshore. None of the listed species are in the vicinity of proposed activities at Port Oneida, nor would be affected by them. The USFWS concurred with the NPS determination of no effect on federally threatened or endangered species or critical habitat in a letter dated September 21, 2011.

10. Whether the action threatens a violation of federal, state, or local environmental protection law:

The selected alternative will not violate any federal, state, or local environmental protection laws.

Public Involvement

On November 4, 2010, scoping letters were 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 allowed 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. A Public Comment Summary was prepared and posted on PEPC on May 4, 2011.

The EA was on public review from August 9 to September 12, 2011. On August 9, 2011, letters were mailed to 140 federal, state, and local agencies, elected officials, groups and interested individuals. 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, and a press release was distributed electronically to the 42 media outlets in the National Lakeshore's media database. Hard copies were distributed to area libraries and governmental offices. A public open house was held at the National Lakeshore Visitor Center auditorium in Empire on August 23, 2011, from 5:00-7:00 p.m., with 31 people attending. The public open house included a formal presentation and a question and answer period. The presentation was placed on the park's website.

As a result, we received 25 comments from the PEPC website, 12 emails, and three handwritten or typed letters.

The USFWS, East Lansing Field Office, responded to the NPS request for comments in a letter dated September 21, 2011. They concurred with our determination of no effect on federally threatened and endangered species or critical habitat in the National Lakeshore, but had comments on how the conservation of migratory birds should be addressed. They provided updated information for the Affected Environment chapter (page 3-6), which will be included in the Errata Sheet for this project. They agreed with the EA's assessment that both alternatives would have some level of negative impact on migratory birds of special concern, especially under the Preferred Alternative, which includes some level of cultivation and higher intensity long-term impacts. They noted that "the cultivation of open meadows and old field succession into row crop or orchard agriculture would result in habitat loss and habitat degradation for many of the migratory bird species of special concern..." They also noted that "...alternative 2...will have long-term negative impact on populations of migratory bird species of special concern..." Additionally, they stated that "...as mowing activities are currently conducted so as not to impact migratory birds, the long-term impacts to openland birds...should be minimal under alternative 1."

The USFWS referenced the 2010 Memorandum of Understanding (MOU), entered into by the USFWS and NPS to promote the conservation of migratory birds. The MOU, which will be described and referenced in the Errata Sheet for this project, directs both parties to develop strategies to avoid, minimize, or mitigate actions that could have effect on migratory birds. As such, USFWS recommended that as implementation plans are being developed, the National Lakeshore work closely with USFWS to focus active agriculture on smaller fields and minimize fragmentation of larger fields. USFWS has offered assistance in developing other conservation measures, including appropriate herbicide use and farming practices best suited for grassland birds.

The National Lakeshore is committed to conserving migratory bird species and will work closely with the USFWS to develop and implement conservation measures to this end as we develop action plans for the Port Oneida historic landscape.


The SHPO, in a letter dated October 13, 2011, generally concurred with the NPS finding that the selected alternative will not adversely affect any resources listed on, or eligible for, the National Register of Historic Places, nor will it impact any other significant park resources. The SHPO also favored the NPS Preferred Alternative. They did question, however, if consideration should be given to a re-evaluation of the end-date of the period of significance, particularly since the period of significance was defined approximately 15 years ago. They also suggested a proactive approach to managing orchards so that they will not disappear.

Conclusion

The selected alternative does not constitute an action that normally requires preparation of an Environmental Impact Statement (EIS). The selected alternative will not have a significant effect on the human environment. Negative environment impacts that could occur are negligible, minor, or moderate in intensity. There are no significant impacts on public health, public safety, threatened or endangered species, or other unique characteristics of the region. There are no unmitigated adverse impacts on sites or districts listed in or eligible for listing in the National Register of Historic Places. No uncertain or controversial impacts, unique or unknown risks, significant cumulative effects, or elements of precedence were identified. Implementation of the selected action will not violate any federal, state, or local environmental protection law.

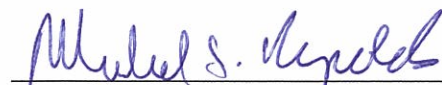
Based on the foregoing, it has been determined that an EIS is not required for this project and thus will not be prepared.

Recommended:


Dusty Shultz, Superintendent
Sleeping Bear Dunes National Lakeshore

12/22/2011
Date

Approved:


Michael Reynolds, Director
Midwest Region

01/17/12
Date

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 to 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 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 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.

A 2009 updated assessment of historic openland habitats, conducted by Corace et al, found a wide variety of openland migratory bird species, including the Henslow's sparrow (*Ammodramus henslowii*) and the upland sandpiper (*Baratramia longicauda*), both considered "Birds of Conservation Concern" in the region by USFWS.

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. Additionally, the National Lakeshore will work closely with the USFWS under the procedures described in the 2010 MOU to develop and implement migratory bird conservation measures as action plans are developed for the Port Oneida historic landscape.

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 from 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.