



**Point Pelee National Park of Canada
Vegetation Management Objectives**

North-South Environmental Inc.

POINT PELEE NATIONAL PARK OF CANADA

VEGETATION MANAGEMENT OBJECTIVES

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prepared for:
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1.0 INTRODUCTION

Point Pelee National Park (PPNP) supports an outstanding diversity of plant and animal life, much of it unusual or unique in Canada owing to the southern location of the Park and its biophysical characteristics. Parks Canada manages the Park with the primary goal of maintaining or improving its Ecological Integrity. A critical part of this management is ensuring that the vegetation is maintained in as natural condition as possible. To facilitate this, a set of Vegetation Management Objectives (VMOs) (Landplan 1990) is required to guide management actions. This document serves to update the existing VMOs to ensure they are appropriate, both in terms of the Park's current situation (new land acquisition) and present day ecological theory.

Point Pelee N.P. is also unique with respect to its regional setting. Not only is the Park very small (15.5 km²), but is also surrounded by a relatively developed landscape (primarily agricultural), and is fairly isolated from other natural areas. This setting, combined with its small size, results in many negative impacts that originate from outside the Park boundaries, and which are essentially beyond the ability of the Park staff to control. A prime example of this is the shoreline development adjacent to the Park (2 harbours, numerous shoreline structures) that has a major negative impact on the Park's shoreline dynamics.

The Vision and VMOs provided in this report represent a long-term “ideal”. This ideal could only be achieved in the very long-term and may not be entirely attainable. However, they reflect the vegetation the Park should support, and provide guidance for its management.

1.1 Brief History and Existing Conditions

The Park comprises three main landholdings: Point Pelee and the Sturgeon Creek properties on the mainland, and Middle Island, the most southerly point in Canada. The following provides a brief sketch of the Park's history to provide some background for this report.

Point Pelee

The Park encompasses a total of 15.5 km², and is located on the southern portion of a large sand spit that extends southward into Lake Erie. The Park forms the southernmost point of land in mainland Canada. The mainland part of the Park includes the sandy spit, and a large (1113 ha) marsh that comprises approximately 70% of the mainland Park area. Point Pelee originally formed part of a land bridge that linked what is now mainland Canada with Pelee Island and the Bass Island group in Ohio. This may be important from the perspective of the post-glacial dispersal of plants and animals to the Pelee area. Owing to its southern location, the Park supports an unusual assemblage of plants and animals, some of which are found no-where else in Canada. Jellicoe (1984) reports a total of 775 species of vascular plants occurring at Point Pelee. This includes a total of 73 rare plants, 64 of which are rare on Ontario, and 15 which are COSEWIC listed.

The archaeological record suggests the Point was not a place of permanent occupation by First Nations people. However, a wealth of artefacts have been unearthed that indicate Point Pelee was used on a regular basis as a summer encampment for hunting and fishing. Discussions with the

regional archaeologist (Neal Ferris pers. comm.) and general research on land management practiced by native people, support this and suggests that Point Pelee would have been managed for its resources, and that fire would have been regularly used for habitat improvement.

There is a fairly long record of observation on the flora and fauna of the Point. A Jesuit priest noted in 1721 that, “*the east side is a sandy tract of land with nothing but red cedars that are quite small and not abundant in quantity.*” (in Battin and Nelson 1978), suggesting that the Point was very open at that time. This is consistent with the hypothesis that disturbance maintained substantial areas of open sandy barrens and savannahs at Point Pelee.

Although there was visitation by European explorers from the late 1600s, and the Point was surveyed about 100 years later, the first permanent settler did not establish on the Point until 1830. Following settlement, active agriculture, forestry and commercial fishing ventures were established on the Point, all of which had impacts on the vegetation and wildlife.

Point Pelee National Park was established in 1918, primarily in recognition of its outstanding avifauna, especially during migration. However, resource harvesting did not cease immediately, but petered out gradually as PPNP became the focus of recreational activities including cottage development. By the late 1950s, there were 11 cottage subdivisions in the Park. Agricultural activities, especially fruit production and asparagus farming were still prevalent in the 1950s. These activities were largely eliminated through land acquisition by Parks Canada in the 1960s and early 1970s. During the 1950s and 1960s, recreational use of the Park increased and was quite intense with vehicle access to the beaches. A typical management activity associated with the recreation focus in the Park was the removal of underbrush. This was done to “*...reduce the growth of natural grasses and to provide picnic grounds for visitors.*” (Battin and Nelson 1978), and was widespread into the late 1950s. A more conservation-oriented management approach was developing by mid-century, and many of the more destructive management practices were gradually phased out. However, through the 1950s and into the 1960s there was no control of camping, and tents could be erected anywhere on public land. Additional activities in the last century included: offshore gas and oil exploration, offshore sand and gravel extraction, forestry, shoreline stabilization, and insect control (using DDT). By the mid-1960s, a conservation-directed management regime became more prevalent and an active program of cottage removal and cessation of extractive activities was initiated.

Commensurate with the cessation of disturbance, vegetation succession has resulted in a more closed tree canopy. The open, park-like woodlands that were dominated in many places by red cedar in the 1960s and early 1970s, are now closed-canopy hackberry forest, a species that was apparently not present in the Park at the time of settlement. This trend to a mature, closed forest is having a substantial impact on the retention of native vegetation communities and rare species of flora and fauna. In addition to the hackberry forests, there are also extensive beaches, small remnant sand barrens and savannahs, areas of shrub thicket, wet meadows and the huge marsh that contains a number of open-water ponds. Notwithstanding the history of disturbance, the rich natural diversity that remains in the park after several hundred years of exploitation is remarkable.

Middle Island

Middle Island is part of the Pelee archipelago, a chain of islands on a limestone bedrock arch that extends from Point Pelee to Sandusky, Ohio, across the shallow western Lake Erie basin. The island is 18.5 ha. It was formerly used as a summer retreat, which once supported a hotel and casino, with an airstrip providing access. It was privately owned until the Nature Conservancy of Canada purchased it in 2000, and subsequently turned over to Parks Canada to manage.

The island has a predominantly wooded interior dominated mainly by hackberry, with a surrounding cobble and rock beach. A narrow gravel bar extends west from the shore of the island. The vegetation on the lawns and airstrips was originally kept in an early state of succession by pigs, cattle and goats, none of which remain. The airstrip and lawns in the centre of the island are rapidly succeeding to young hackberry forest. A pond on the west end of the island is all that remains of a lagoon, dug as a boat mooring whose opening to Lake Erie subsequently filled in.

Middle Island, like Pelee Island, has an average frost-free period of 195 days, longer than any other part of Ontario and most of Ohio. This climate allows for a growing season equivalent to that of West Virginia, which results in a mix of plant communities on the western Lake Erie islands that are found nowhere else in Canada or in any of the adjacent U.S. states. A total of 25 rare plant species (19 provincially and 6 COSEWIC listed species), many at the northern edge of their range in North America, have been reported from Middle Island, though some have not been recently found. Many of these species are found in the areas most recently altered by man, especially the airstrip and the lagoon. The island also harbours Lake Erie water snake, a nationally endangered subspecies.

Double-crested cormorants, which were almost extirpated from the Great Lakes in the 1960s, began to nest on the island in 1987. The population rapidly expanded to over 1000 nests in 1994, over 3000 in 1997 and over 6000 in 2002. Numbers dropped to 3757 nests in 2003, but it is not yet known where numbers will stabilize. The impact from cormorant nesting appears to be threatening some of the rare natural heritage features on the island.

Sturgeon Creek

The Sturgeon Creek site was formerly an agricultural field and was purchased by Parks Canada. In the 1990s, restoration efforts were initiated to re-establish indigenous hardwood forest. A portion of the site was subsequently used to re-locate the park administration and maintenance facilities, as part of a long-term commitment to reduce the infrastructure within the Park.

Summary

From the perspective of vegetation management, it is important to recognize that PPNP (including Middle Island) is not a pristine natural environment. The extensive and intensive uses that occurred there, and the small size of the Park have had a substantial impact on its physical environment, vegetation, flora and fauna. Notwithstanding the past disturbance, there is still a remarkable diversity of vegetation and plant species, many of which are nationally and/or provincially significant. The rarity of the vegetation and the near uniqueness of the landform are compelling reasons to invest in the management of the Park with the aim of restoring, to the extent possible, natural ecological conditions and the associated biological diversity. In addition,

the limitations to managing the Park owing to its size, history and the large number of trans-boundary impacts, require that Parks Canada invest and participate in conservation initiatives outside of the Park boundaries, thus helping secure the biological resources of the Park, and enhancing the ecological integrity of the Greater Park Ecosystem.

Another corollary of the Park's size, context and history is that active management is needed to maintain and restore the Park's natural biological diversity. This not only means mitigating and rehabilitating the impacts from past activities, but also re-instating the conditions that sustained the Park's biota in the past.

In order to provide clear direction for the management of the Park's vegetation, it is important to have a set of objectives. The objectives provide a number of functions including:

- providing a transparent record of the intent of management;
- providing measurable and attainable documentation of the end point of management;
- acting as a yardstick against which results of management can be evaluated in order to validate both the objectives and management prescriptions; and
- identifying priority management needs to ensure no loss of valued species and vegetation types occurs.

The first set of objectives for managing the Park's vegetation was produced in 1990 (Landplan 1990). They responded to Park issues of the time and reflected the then current ecological understanding of the Park's biotic and abiotic features. Since that time, the addition of Middle Island, additional research, a greater understanding of the Park, and substantial reductions in Park infrastructure have prompted a revision of the objectives. This was done in two major phases. First an analysis and summary of the existing objectives was undertaken (see section 1.4 for description of analysis and summary phase). This, along with input from a workshop session, is documented in an Analysis and Summary Report (North-South Environmental 2004a). This current report responds to the findings of that exercise, and the substantial input from participants at the Vegetation Management Objectives Workshop, and provides a set of objectives for guiding the management of the Park's vegetation into the future.

1.2 Purpose

The purpose of this report is to provide updated objectives for managing the vegetation at PPNP. The focus of these objectives is to provide guidance regarding the kind of vegetation that needs to be sustained at Point Pelee. They are not prescriptive in that they do not provide detailed actions for vegetation management. The detailed management prescriptions should be developed through a Management Plan that focuses on the actual tasks that need to be accomplished in order to achieve objectives. Some of these management plans, such as the *Exotic Plant Species Management Plan* (Dunster 1990a), *Red Cedar Savannah Restoration Plan* (Geomatics 1994), have already been completed.

In general, objectives need to be attainable and wherever possible, expressed in quantified terms so that they can be accurately evaluated in the future. This is somewhat hard to do with this kind of study. For instance, it is not appropriate to dictate the exact amount of a particular type of

vegetation (*e.g.*, the number of hectares of sand barren required). The approach should be ecological and focus on restoring the conditions that support native vegetation communities. The area of each community that results from re-instating those conditions cannot be predicted. Moreover, the area can be expected change through time in response to annual weather patterns, climate change and other stochastic events. For the same reasons the proportions, and sometimes even the presence of various canopy and understory species should not be quantified in the objectives. The mix of species that results from the re-instating natural processes cannot be predicted and will also vary in response to various environmental parameters.

1.3 Scope

The scope of this study encompasses the original Park area (Point Pelee), the Sturgeon Creek site (the new location of the administrative facilities on Monarch Lane), and Middle Island (a 2001 addition to PPNP). However, to the extent that the vegetation of the Park is influenced by events and land uses outside of Park boundaries, the surrounding landscape (the Greater Park Ecosystem) is also considered part of the study area, wherever relevant. The existing Vegetation Management Objectives (Landplan 1990), however, only addressed the original park area (Point Pelee).

1.4 Approach

The general approach to this study was to:

- i. review and analyze the 1990 VMO;
- ii. conduct a workshop with various experts and Park staff on the Park's vegetation; and
- iii. develop a refined set of objectives based on i) and ii).

The methods for undertaking the review and analysis of the 1990 VMOs are documented in detail in the Analysis and Summary Report (North-South Environmental Inc. 2004a). It primarily involved a review of existing reports, including Species At Risk (SAR) summary reports; assignment of SAR to habitats to enable potential conflicts between SAR and vegetation management to be identified; a review of the 1990 VMOs; evaluation of past, current and proposed management actions *vis á vis* the objectives; and identification of future management requirements.

The review of the 1990 VMOs included: appropriateness of wording; inclusion of monitoring and adaptive management; identification and prioritization of management actions; consistency with current scientific theory and practice; and adequacy of objectives to achieve desired results.

The workshop was a key component in the development of new VMOs. A formidable group of vegetation ecologists was assembled with extensive experience in the Park going back over 30 years. A list of participants is provided in Appendix 1. The workshop consisted of the following basic components:

1. Orientation to Point Pelee National Park;
2. Discussion of major issues facing Point Pelee National Park;

3. Tour of Point Pelee National Park highlighting management concerns;
4. Contents of a Vision for the vegetation including participants preparing their own Vision Map;
5. Discussion of a draft Vision Statement; and
6. Discussion of objectives for Vegetation Management (by major vegetation type: forest, marsh, shoreline, sand barren, *etc.*).

The workshop was well attended by Park staff and there were many good discussions about fundamental management issues in the Park, as well as insights to the condition of the Park's vegetation in the past. The views and expertise of the workshop participants, especially where there was widespread agreement, were important inputs into the VMOs provided here. A point form summary of conversations (informal and within the workshop) is appended to this report (Appendix 2).

The Species At Risk (SAR) listed for Point Pelee National Park were based on hardcopy and digital databases provided by the Park using the following criteria provided by park staff:

- species designated nationally as special concern, threatened, or endangered by COSEWIC;
- species designated as provincially rare (S1 or S2) or provincially uncommon (S3) by the Natural Heritage Information Centre (NHIC);
- plant, bird, mammal, reptile and amphibian species that are either rare in the greater park ecosystem or extirpated from the park, but which are common in the province.

The final list of SAR was decided by Park staff. The SAR designated using these criteria go beyond the definition provided in the SAR Act. The only species subject to the provisions of the SAR Act are those listed in the appendices of the Act as Extirpated, Endangered, Threatened or Special Concern. The Appendices of the Act will continue to be added to as additional species are assessed by COSEWIC and regulated under the Act.

The development of the VMOs provided here is based on the analysis of the 1990 VMO, the expertise of the workshop participants, the experience of the study team at Point Pelee and input from Park staff. The Vision Map and Vision Statement in particular drew heavily from the maps developed by workshop participants (provided to the park under separate cover), and their observations on the content of a draft Vision Statement. Thus the proposed VMOs incorporate consideration of the new park boundaries, current condition of the vegetation and ongoing successional developments that result from current and recent Park management. They also reflect current ecological understanding, especially the need to re-instate the natural disturbance mechanisms that supported the vegetation communities indigenous to the Park.

1.4.1 An Ecosystem Approach

The fundamental philosophy governing the approach taken in this study was an ecosystem approach. A basic tenet of plant ecology is that any given suite of environmental conditions (climate, landform, soil, drainage, disturbance, *etc.*), in conjunction with the dispersal characteristics of the local flora and fauna, will support a particular set of plant and animal species. If the environmental conditions change, so will the species. Conversely, if the

environmental conditions for a particular vegetation type, or particular species are not established, it is virtually impossible to sustain those species (at least not without substantial effort and expenditure of time and energy). Thus the fundamental requirement to maintain and restore the Park's vegetation is to reinstate the appropriate environmental conditions (to the extent feasible and possible).

Another important aspect of this approach is that the focus of management is at the community level, not the population level. This assumes that if the appropriate conditions are created, then the desired complement of species that are indigenous to the Park will establish itself. In some cases, management prescriptions may not directly benefit, and may even harm, a particular species, even a SAR, necessitating special measures be implemented. For example, eastern prickly pear cactus (*Opuntia humifusa*) is not tolerant of fire, but persists in open areas of sand that were created by fire and other forms of disturbance. Overall, it will benefit from community level management that will create more open sandy habitat, but owing to the limited number of patches left, it may be necessary to implement species-specific measures along with community initiatives. For instance, duff can be raked away from cactus patches and they can be doused in water prior to a burn to minimize chances that the patches themselves will burn. Additionally, there are other impacts (e.g., trampling, collection) that need to be managed to protect the Park's biodiversity.

The ecosystem approach poses the difficult question of how to manage any native species, including SAR, that are not native to the Park (section 7.4). This conflict will eventually have to be resolved by Park staff, taking guidance from Parks Canada policy and perhaps senior Resource Conservation staff at Parks headquarters.

There may also be instances where species-specific management at the population level is warranted in the short-term because population levels are critically low. This should be an important component of a vegetation management plan, but should be viewed only as a temporary measure, pending the restoration of habitat. Species recovery plans should aim to secure adequate habitat so that population level management is not required in the long-term. Any species requiring this level of management should be identified as part of species-specific studies, such as Species Recovery Plans.

Because wildlife habitat is principally determined by vegetation, management of the vegetation will affect wildlife in the Park. As such, the impacts of vegetation management on wildlife must also be considered during the development of VMOs. This is most critical for SAR where, as noted above, management prescriptions may potentially conflict (or at least appear to conflict) with the Park's mandate to preserve biological diversity. Also, any provisions of the SAR Act must be considered in the development of management prescriptions.

2.0 FUTURE VEGETATION OF THE PARK

As part of the workshop exercise, participants were asked to contribute to a Vision of the vegetation of Point Pelee National Park. This was done both in map form (10 maps were eventually submitted) and as a series of observations that should be included in the Vision. No Vision maps were completed for Middle Island or Sturgeon Creek owing to the lack of familiarity of most participants with these sites.

Although this may seem like a subjective exercise, it is quite analytical for participants with ecological training and an intimate knowledge of the Park. The Vision is an integration of knowledge of the communities that would be expected to form on the combination of topography, soils, drainage, natural disturbance, nutrient availability, parent material, climate, *etc.* that occur at PPNP. This is enhanced by personal knowledge of the species and communities in the Park and the conditions that sustain them. For instance, the many savannah and prairie species that persist in low numbers, combined with the appropriate landform, soil, and microclimate, clearly speak to the former presence of savannah and prairie, rather than the existing closed-canopy, predominantly hackberry forest. Also, the existing historical records from early explorers and settlers were used to assist in the understanding of the vegetation when it was still primarily a reflection of natural processes.

Thus the Vision is not just an expression of individual preference, but a professional evaluation that draws on a wealth of experience and understanding of vegetation ecology. It is important to understand that the Vision is not necessarily based on the existing vegetation, which is a product of many years of human activities and modification of natural disturbance regimes, but arises from an expectation of the vegetation that would occur if ecological processes were unimpaired.

From the late 1960s to the late 1970s, Paul Maycock undertook ecological studies in the Park including descriptions of the vegetation. He also predicted the future of the vegetation based on a floristic analysis. That is, he predicted the future vegetation on the basis of the existing vegetation. Since his work, succession has occurred as he suggested (at least in broad terms) with a trend toward closed-canopy deciduous forest. There has been insufficient recent, quantified work on the whole Park to test if his prediction of increased presence of maple has occurred. However, it was the unanimous opinion of vegetation specialists invited to the VMO Workshop that the suppression of fire is a major factor in this trend to a closed canopy, and that the re-instatement of this natural disturbance regime would result in a mosaic of vegetation that includes a higher proportion of deciduous savannah, open woodland and sand barren, as previously existed. It is this latter view that supports the Vision articulated below.

It is worth noting that the need to re-introduce fire to PPNP was also voiced at the 1990 workshop on the Park's vegetation. This gave rise to the recommendation that a strip of sand barren (then called Red Cedar Savannah), be restored in the interior of the Park. This idea was quite radical for the time, since most management (not just within the park, but generally in North America) was oriented to minimizing intervention. Since that time, there has been a widespread acceptance that management must be more active to re-instate suppressed disturbance mechanisms. There has also been an acceptance that fire was more widespread in

the Park (and elsewhere in southern Ontario) than was thought in 1990. This change is reflected in many of the comments made during the 2003 workshop.

Workshop participants raised 24 points that they recommended be part of the Vision for the Park's vegetation (Appendix 3). Many of these were guidelines for management, or comments on operations and responsibilities for management. However, others are relevant for depicting the type of vegetation that the participants felt should persist at PPNP. A summary of the relevant comments is provided:

- Natural processes that have been suppressed, either within and/or outside the Park, need to be restored or mimicked (*e.g.*, fire, long-shore drift, breaching of the barrier beach, hydrology of the marshes, *etc.*).
- Fire needs to be accepted as a primary management tool for restoring successional processes in the Park.
- Barriers to shoreline erosion and long-shore drift adjacent to the Park need to be minimized.
- Recognize that the Park is a dynamic, changing, environment where natural disturbance is respected, and actively maintained.
- Aim toward a better sand budget. The sand budget impacts several aspects of the Park such as the presence and extent of vegetation types along the eastern shore (former existence of red cedar savannah along the east beach), and breaching adjacent to the marsh ponds.
- The marsh should be managed to maintain optimum centre to edge ratio and optimum interspersion, aim toward a better sand budget, accept breaching as a natural successional process.
- Strive to establish examples of pre-settlement vegetation.
- Maintain flexibility in determining VMOs, within a broad definition of red cedar savannah/sand barren, with a strong native graminoid component under cedar.
- Maintain the functional gradient/mosaic that should exist between shoreline and interior areas as a result of coastal processes (wind, wave and ice action), determined by the dynamic nature of the sand substrate.
- Try to restore the topography of the Park to promote microclimate.
- The connection between aboriginal practices and VMOs should be made clear.
- Reduce the abundance and frequency of non-native plants.

A Vision Map, showing the approximate extent of the different vegetation types at Point Pelee is provided in Figure 1. It is a composite of the Vision maps that were submitted at the workshop, combined with the information taken from the discussions. Figure 2 shows an idealized cross-section of the Park. It illustrates the relationship among the main plant communities, but should not be taken as a literal representation of the Point's vegetation. The distribution of vegetation types in PPNP responds to microclimatic and topographical variation that is more complex than the cross-section or the Vision Map can communicate. As Maycock (1977) noted, "*The general forest pattern is somewhat variable depending on the particular location...*" There is a general trend along the north-south axis of the park, with older, more stable plant communities occurring at the north, and younger communities to the south. This may be an artefact of human disturbance and subsequent recovery, or increasingly intense effects of natural disturbance.

Figure 1. Vision Map

Figure 2. Topographic Sequence

2.1 Mainland Park: Vision for the Vegetation

Introduction

The underlying sandspit landform at Point Pelee is a major determinant of the vegetation that occurs there. Point Pelee is formed by two long sandy arms that extend out into Lake Erie and converge to a point. These arms encompass a large freshwater marsh. The western arm is appreciably wider to the south, and contains an interior sand plain (*sensu* Maycock 1977). For the most part, the eastern arm remains essentially a barrier beach separating Lake Erie from the open marsh and ponds.

The physical environment at PPNP is dynamic, characterized by disturbance in the form of storms, ice scour, wind, water level fluctuations, and active shoreline erosion and deposition. Historically, fire would have occurred from lightning strikes, as well as being set by First Nations peoples (probably including the Marsh). The native vegetation and wildlife reflect this disturbance and, therefore, fire should be accommodated in the long-term Vision for Point Pelee ecosystems in order to restore and maintain ecological integrity.

The overall Vision is characterized by seven major vegetation communities as described below and illustrated in Figure 1. These can be idealized as a gradient, as shown in Figure 2. This gradient may not actually occur in PPNP exactly as drawn, but it is a useful conceptualization to illustrate the relationship of the major vegetation types. More detailed visions for each of the now nine major vegetation communities are provided in section 4.0.

Vision (with reference to the stylized gradient in Figure 2)

The beaches and associated thickets (including some relatively small inclusions of sand barren) on the east and west shorelines are highly dynamic, and are influenced mainly by disturbances related to the lake such as wind, storms and ice scour. Inland of the beaches on the west side of the peninsula are the most developed dune formations, and it is on these that the predominant savannah and woodland would develop. In the most interior part of the Park, east of the savannah/ woodland complex, is a flatter ridge of land that has been described as an interior sand plain (Maycock 1977). This is probably the hottest, driest part of the Park and it is shown supporting a mixture of sand barren/red cedar savannah with species typical of sand prairies and scattered shrub thickets. The dominant disturbance in the savannah, woodlands and sand barrens is fire, and the distribution of the savannah, sand barren and shrub thickets is quite dynamic. To the east of the sand barrens, wet meadows interspersed with thicket swamp would occur. These wet meadows grade into the marsh and are hypothesized to have been present prior to the digging of the drainage canals along the marsh edge, south of the marsh boardwalk. Fire is also probably an important natural disturbance in the marsh, helping to maintain a heterogeneous mixture of openings, ponds and floating marsh vegetation. South of the marsh, the sand barrens abut the swamp forest (note that the Swamp Forest is not shown in Figure 2 cross section). On the east side of the marsh, the east beach provides a barrier against Lake Erie. The east beach is relatively narrow, and varies in width depending on: storms, sand accumulation/erosion and water levels. This dynamic environment sometimes supports wet meadows on the marsh side of the beach, and may also support small patches of sand barren.

2.2 Middle Island: Vision for the Vegetation

Middle Island would be considered a largely forested but dynamic environment where disturbance processes regularly “re-set” vegetation to an early successional stage. These processes, including extreme winds, flooding and possibly fire, may contribute to the island’s role in conserving significant vegetation. These disturbances may be local but also may occasionally be catastrophic given the small area of the island, the shallow soils and the exposed location in Lake Erie. In the past, human disturbance has mimicked natural disturbance by removing forest cover in some areas of the island. The island’s flora would consist of a mosaic of early successional and forest vegetation, largely dominated by native species with affinities to vegetation in the Deciduous Forest zone. Marsh vegetation may occasionally become established if portions of the island become inundated for long periods because of large-scale flood events. However, in the recent past this type of vegetation has been associated only with a man-made lagoon, and therefore, may not be a “natural” component of the island.

2.3 Sturgeon Creek: Vision for the Vegetation

The vision at Sturgeon Creek is to create, through restoration, a self-sustaining forest community comparable in species diversity and physical attributes to other forests in the region that occur on similar sites.

3.0 ECOSYSTEM OBJECTIVES

As noted in section 1.4.1, ecosystem-level management is the cornerstone philosophy for Parks Canada. For this reason, it is useful to articulate management objectives at an ecosystems level. However, it is difficult to manage directly at the ecosystem level. Actual management actions generally involve the manipulation of ecological conditions (*e.g.*, burning, water level control) at the community level of organization, or intervention at the population level (*e.g.*, removal of non-native species, planting native species as part of restoration initiatives). Together, these actions contribute to achieving the desired ecosystems in the Park. Thus, while management is directed at achieving healthy ecosystems, the actions to get there are implemented at lower levels of organization. For this reason, there is a strong relationship between the goals and objectives at the ecosystem level, with those at the community level (vegetation unit level).

Dryland Sand Peninsula typical of the western basin of Lake Erie

Goal

To restore native vegetation representative of dryland sand peninsulas of the western basin of Lake Erie. This ecosystem should be composed primarily of a mosaic of: woodland, savannah, beach/shrub thicket and sand barren (descriptions for each of these communities are provided in section 4.0).

Objectives

1. Restore/accept natural disturbance regimes (*e.g.*, fire, erosion and sedimentation, breaching of the barrier beach).
2. Re-introduce, where warranted, indigenous species and remove exotics.

Lower Great Lakes Coastal Marsh

Goal

To restore a heterogeneous marsh ecosystem as a representative example of a lower Great Lakes Coastal Marsh, that is composed primarily of cattail mat interspersed with open water and meadow marsh, and that is ecologically linked to Hillman Marsh to the north (descriptions of the marsh and adjacent wet meadow are provided in sections 4.8 and 4.9).

Objectives

1. Restore/accept natural disturbance regimes (*e.g.*, periodic burning and ongoing disturbance associated with occasional breaches in the east barrier beach).
2. Consider restoration of the original drainage from the north as a long-term objective, contingent on an understanding of potential impacts associated with the long history of agricultural usage the north of the Park.
3. To the extent possible, restore ecological connections that will link the marsh in PPNP with Hillman Marsh to the north.

Western Lake Erie Island

Goal

To restore native vegetation representative of western Lake Erie Islands, including hackberry forest as well as earlier successional vegetation types such as thicket or hackberry-Kentucky coffee-tree-chinquapin oak savannah, should they arise as a result of natural disturbance.

Objectives

1. Minimize negative impacts of double-crested cormorants on significant plant communities and SAR.
2. Restore/accept natural disturbance processes such as ice scour, windthrow, erosion and natural colonization by as-yet unrecorded native plant species as part of the natural disturbance regime that maintains the diversity of the flora.

4.0 VEGETATION MANAGEMENT OBJECTIVES - POINT PELEE

This section outlines the goals and objectives for specific vegetation types. It should be read with regard for the overall Vision statement, as the Vision describes the desired endpoint, and provides context for the Objectives. The objectives are intended to provide direction for management, and although some important tasks are mentioned, there was no intent to identify a complete set of management actions required to achieve the objectives.

Each of the sections within each vegetation type contains comments raised at the workshop, as well as some key tasks that need to be completed to achieve the objectives. Since some concerns expressed by different individuals at the workshop overlapped, the sections contain some repetition. Management actions and the Park-wide objectives are prioritized as High (H), Medium (M) or Low (L), based on their contribution to maintaining or improving the Ecological Integrity of the Park. These priorities were established with input from Park staff. The management actions, Park-wide objectives and priorities are summarized in Appendix 4.

4.1 Park-Wide Management Objectives

There are a few VMOs that apply to all, or at least nearly all vegetation types, and are thus placed here in a separate section to avoid repetition. Some of these issues were not mentioned at the workshop or in subsequent discussions, but are discussed in the 1990 VMOs (Landplan 1990).

1. Control exotic plant species in the Park. (H)
Continued management of exotic species, per the Exotic Species Management Plan (Dunster 1990a), should be undertaken, noting that many of these are expected to decrease in some vegetation types through the re-introduction¹ of fire. Certain priority species are also noted in sections on individual vegetation types.
2. Minimize impacts from deer browsing. (H)
To the best of our knowledge, the current number of deer is acceptable with respect to minimizing impacts to vegetation (deer impact was not mentioned as a concern at any point during this project). Thus, continuation of deer control efforts to maintain the target herd size at levels established by the Park is appropriate. However, should impacts to vegetation be identified in the future, this may have to be re-assessed.
3. Use only indigenous species for restoration projects in the Park. (H)
In the past, non-native plant species have been used for landscaping purposes. This practice has been discontinued, however, the objective to only use species indigenous to the Park should remain clearly stated. Additionally, any re-introductions that are undertaken should use individuals of local provenance wherever possible, unless inbreeding depression is considered to be one of the causes of extirpation.
4. Minimize impacts from trail maintenance. (M)
Current practice for trail maintenance was not investigated, however, the practice of trimming the edges of trails should be discontinued. The constant use of trails should be sufficient to prevent the spread of adjacent vegetation. If this becomes a problem in certain areas, it can be treated locally, rather than systemically.

¹ Re-introduction is defined for the purposes of this report as restoring a species or habitat through direct human intervention.

5. Eliminate impacts from pruning. (M)

Generally, no plant material in the Park should be pruned. However, there may be exceptions such as:

- pruning limbs that pose a danger to Park visitors and staff; and
- pruning to remove diseased limbs that may pose a widespread threat (e.g., Dutch elm disease).

It is important to consider the potential impact of pruning SAR, even where they might be an endangerment to humans. For example, red mulberry (*Morus rubra*) has been pruned back from roads in the past to allow for safe passage of traffic, however, these prunings may have provided access for secondary pathogens.

4.2 Beach

Along the interface with Lake Erie on both sides of the Point are open sand and gravel beaches. The beaches are recognized as highly dynamic environments that change in response to lake levels, major storms, ice conditions and shoreline circumstances outside the Park. The sand balance of the beaches has been altered by “hard” structures along shorelines north of the Park, and may be partially restored through removal of these structures.

4.2.1 Vision

Within the park, the upper (drier) end of the west beach, would support strand vegetation composed of dune-forming grasses: switch grass (*Panicum virgatum*), big and little bluestem (*Andropogon gerardii*, *Schizachyrium scoparium*), sand dropseed (*Sporobolus* sp.), American beach grass (*Ammophila breviligulata*) and Canada rye (*Elymus canadensis*), as well as forbs typical of open sand dunes such as: plains puccoon (*Lithospermum caroliniense*), starry false-Solomon’s-seal (*Maianthemum stellatum*), cocklebur (*Xanthium strumarium*) and sea rocket (*Cakile edentula*). The beach would continue to support the significant species that occur there at present such as: slender eight-flowered fescue (*Vulpia octoflora*) and green milkweed (*Asclepias viridiflora*), and in the south, occasional eastern prickly pear cactus (*Opuntia humifusa*). The east beach has a much less developed strand, and in most places, open sand would support only scattered forbs and grasses, but may include some significant species such as: Walter’s barnyard grass (*Echinochloa walteri*), bushy cinquefoil (*Potentilla paradoxa*), and red-rooted nut-sedge (*Cyperus erythrorhizos*).

4.2.2 Goal

To restore, to the extent possible, the natural physical processes and balance of erosion and deposition that maintains the beaches at Point Pelee, and allow the natural succession of beach vegetation to occur. Unless warranted, the beaches should be managed minimally, with intervention only where needed to mitigate human-caused problems.

4.2.3 Objectives

1. Reduce the number and extent of structures along the shorelines north of the Park that restrict erosion from occurring and/or disrupt the natural flow and delivery of sediment to the Park through longshore drift.

2. Maintain the current strategy of not interfering with the consequences of natural erosion and deposition in the tip area (*i.e.*, do not remove sand deposited in the woodland at the tip, or try to stabilize the beach with artificial structures).
3. Minimize visitor impacts on the beaches on either side of the tip, in the highly dynamic areas subject to erosion and deposition (access to the extreme tip is probably acceptable).
4. Remove common reed and purple loosestrife (*Lythrum salicaria*) from beaches, especially along the east beach where it meets the marsh.
5. Maintain, and where necessary restore, naturally occurring coarse woody debris on the beaches to provide the necessary microhabitat for five-lined skinks.
6. Determine the sand budget, including quantification of the sand loss, with the aim of understanding deficiencies in the deposition rates and volumes on the beaches.
7. Minimize the remnant beach structures on the west tip (concrete rip-rap and limestone blocks).
8. Encourage natural stabilization of the dune system throughout the Park.
9. Record and monitor naturally occurring barrier beach breaching events, but in general, do not interfere and/or attempt to close these breaches.

4.2.4 Units from 1990 Vegetation Management Objectives

This vegetation community includes the following vegetation units from Map 1 of the 1990 VMOs (Landplan 1990).

Beach: Units 1-5

Beach - anthropogenic: Units 1-8

Anthropogenic: Units 3, 12, 17

4.2.5 Management Actions

1. Develop partnerships with agencies and institutions that have input into shoreline planning and management, with the intent of ensuring that the Park's position on shoreline restoration is promoted. (H)
2. Assemble a presentation for use when meeting with local agencies and institutions that summarizes the importance of natural shoreline processes at Point Pelee, and illustrates the extent of the problem and possible consequence for the region associated with the imbalance of erosion and deposition. (H)
3. Arrange meetings with local planning authorities and institutions (Leamington, Kingsville, Wheatley and Essex County planners, mayor's offices, Chambers of Commerce, Conservation Authority Board, local MNR office) to raise awareness of the shoreline problem and the need for inter-agency cooperation to resolve it. (H)
4. Undertake an analysis of the feasibility of supplementing the sand budget, including quantification of the sand loss, with the aim of increasing the deposition rates and volumes on the beaches. (H)
5. Assess the impact of existing facilities on the natural dune complex along the west beach and implement recovery actions where appropriate. (H)
6. Continue to implement the *Exotic Species Management Plan* (Dunster 1990a) focusing on purple loosestrife along the beaches. (H)
7. Undertake a shoreline study to evaluate the appropriateness of removing the remnant beach structures on the west tip (concrete rip-rap and limestone blocks - although see

Management Issues below), including predictions on the impact to the shoreline of such removal (*i.e.*, will it contribute toward a solution or exacerbate the problem). (M)

8. Assess the relative importance of visitor disturbance along the beach/vegetation interface near the tip with respect to erosional processes, and implement visitor management strategies where appropriate. (M)
9. Develop a program to encourage natural stabilization (*e.g.*, through establishment of dune grasses and forbs, shrubs), and consult with Pinery Provincial Park to review their highly successful dune stabilization program. (M)
10. Document the occurrences of east barrier beach breaches through a review of historical documentation and photographs and maintaining a future record of dates, locations, Lake Erie water levels, weather conditions *etc.* and photographs at the time of occurrence. (M)

4.2.6 Management Considerations

1. The opinion was expressed at the workshop that the rip-rap at the west tip be left in place, since its removal may cause more damage than leaving it in place. Concern was expressed about changing water levels in Lake Erie, however, other than understanding the changes, there is probably no practical management response.
2. In the workshop it was suggested that a determination be made regarding the appropriateness of zoning the tip as a nature reserve as part of controlling access.

4.2.7 Associated Species At Risk

1. The potential for piping plover breeding habitat may exist at the tip and the areas where breaching of the east barrier beach has happened in the past at Redhead and Lake Ponds. This needs to be considered in any management action.
2. There is a need to maintain habitat and restore microhabitat for five-lined skinks along the vegetated back beach areas.

Table 1. Species At Risk known to occur in or expected to occupy the Beach. An asterix indicates species considered extirpated from PPNP. SAR provided by the Park.

Insects	Mammals	Reptiles and Amphibians	Birds
Giant Swallowtail Monarch Juniper Hairstreak Gray Hairstreak	Grey Fox* Eastern Mole	Fowler's Toad* Spiny Softshell Five-lined Skink Eastern Foxsnake Eastern Hog-nosed Snake* Eastern Ratsnake* Blue Racer* Massasauga* Stinkpot Spotted Turtle* Northern Map Turtle Blanding's Turtle	Bald Eagle Piping Plover Caspian Tern Eastern Yellow-breasted Chat White-eyed Vireo Peregrine Falcon Wild Turkey*
Plants			
Green Milkweed (<i>Asclepias viridiflora</i>) Red-rooted Nut-sedge (<i>Cyperus erythrorhizos</i>) Walter's Barnyard Grass (<i>Echinochloa walteri</i>) Bushy Cinquefoil (<i>Potentilla paradoxa</i>) Smith's Club-rush (<i>Scirpus smithii</i>) Trailing Wild Bean (<i>Strophostyles helvola</i>) Slender Eight-flowered Fescue (<i>Vulpia octoflora</i>)			

4.3 Sand Barrens/Shrub Thicket Sand Dunes

This vegetation management unit was included within the Beach unit in the 1990 VMO. Since this vegetation management unit was not discussed at the Vegetation Management Workshop held in 2003, the following vision, goal, objectives, *etc.* should be considered preliminary. This unit, and to some extent the beach strand vegetation, plays a function in reducing the impact of wind erosion by trapping wind-borne sand particles that are swept up off the beach.

4.3.1 Vision

A mosaic of sand barren and shrub thicket would form a natural transition between the beach and the open-canopied savannah on the west side of the Park. The thicket would be characterized by common hop-tree (*Ptelea trifoliata*), choke cherry (*Prunus virginiana*), staghorn sumac (*Rhus typhina*), fragrant sumac (*R. aromatica*) and Drummond's dogwood (*Cornus drummondii*) (this unit would probably fit the ELC "Hop-tree Shrub Dune Type" of Lee *et al.* 1998). The rare shrub/tree, dwarf hackberry (*Celtis tenuifolia*) would also frequently occur here. Where the sand barren occurs, (see below for typical species composition) there may be closed or open thickets of red cedar. However, these sand barren communities would not achieve the size or diversity of those that occur on the interior sand plain. This community would not be expected to be as prevalent on the east beach owing to its narrowness, which makes it more susceptible to destruction during storm events. Maycock (1977) notes the loss of such communities following major storms in 1972.

4.3.2 Goal

To maintain the natural transition zone from the west beach to the savannah as a mosaic of shrub thicket and sand barren openings.

4.3.3 Objectives

1. Investigate the extent to which this is a fire-dependant community and re-instate fire as the primary means of restoring and managing this vegetation unit as appropriate.
2. Provide a continuous strip of natural vegetation, unbroken by human-made structures (e.g., parking areas), that forms a transition between the west beach and the savannah.
3. Provide habitat for rare species of flora and fauna that utilize this vegetation community.

4.3.4 Units from 1990 Vegetation Management Objectives

This vegetation community was mapped within the Beach Unit and includes the following vegetation units from Map 1 of the 1990 VMOs (Landplan 1990).

Beach: Units 1-5

4.3.5 Management Actions

1. Include the sand barren/shrub thicket in the Fire Management Plan recommended for the adjacent savannah/woodland community (see section 4.4.5), and allow any prescribed burns in the adjacent savannah to extend into the sand barren, wherever it would naturally carry. (H)
2. Assess the impact of existing facilities on the natural dune complex along the west beach and implement recovery actions where appropriate. (H)
3. Restore woody debris to depleted areas of vegetated back beach areas to serve as microhabitat for the five-lined skink. (H)
4. Develop a program to facilitate natural stabilization (e.g., through establishment of dune grasses and forbs, common hop-tree) wherever necessary, and consult with Pinery Provincial Park to review their highly successful dune stabilization program. (M)

4.3.6 Management Considerations

1. Concern was expressed at the workshop over the increased weediness: knapweed (*Centaurea* sp), clover (*Melilotus* spp.), and sow thistle (*Sonchus* sp.), as well as succession (invasion of dogwood) and subsequent loss of the wide open area where the hydro access road was located through the shrub sand dunes habitats of the west beach. It was suggested that this be monitored and consideration given to managing the area to keep it open. There was no clear agreement on the need for this.
2. Potential impacts of poison ivy when burned.

4.3.7 Associated Species At Risk

1. There is a need to maintain habitat and restore microhabitat for five-lined skinks along the vegetated back beach areas.
2. The current extent of some significant species (see Table 2) associated with the sand barren adjacent to the west is not known, and should be determined.

Table 2. Species At Risk known to occur in or expected to occupy the Sand Barrens/Shrub Thicket Sand Dunes. An asterix indicates species considered extirpated from PPNP. SAR provided by the Park.

Insects	Mammals	Reptiles and Amphibians	Birds
Giant Swallowtail Monarch Juniper Hairstreak Gray Hairstreak	Grey Fox* Eastern Mole	Fowler’s Toad* Spiny Softshell Five-lined Skink Eastern Foxsnake Eastern Hog-nosed Snake* Eastern Ratsnake* Blue Racer* Massasauga*	Bald Eagle Piping Plover Caspian Tern Eastern Yellow-breasted Chat White-eyed Vireo Peregrine Falcon Wild Turkey*
Plants			
Eastern Prickly Pear Cactus (<i>Opuntia humifusa</i>) Green Milkweed (<i>Asclepias viridiflora</i>) Dwarf Hackberry (<i>Celtis tenuifolia</i>) Common Hop-tree (<i>Ptelea trifoliata</i>) Trailing Wild Bean (<i>Strophostyles helvola</i>) Slender Eight-flowered Fescue (<i>Vulpia octoflora</i>)			

4.4 Savannah and Woodland

The savannah and woodland, growing on the older more stable dunes, would comprise the main forested area of the Park and would represent one of its defining characteristics. Overall, this vegetation would be considered an oak savannah, however, in reality it would be a mosaic of communities, some of which would be more closed, and should be referred to as woodland. “Savannah” and “Woodland” are used here as defined in the ELC (Ecological Classification for Southern Ontario, Lee *et al.* 1998), savannah having between 11% and 35% tree cover, and woodland having between 35% and 60% tree cover. Vegetation specialists at the VMO Workshop were unanimous in their opinion that fire must be re-introduced on a frequent basis to restore these vegetation types to PPNP.

4.4.1 Vision

The open savannah areas would be park-like, with widely spaced, open-grown canopy trees such as: chinquapin oak (*Quercus muhlenbergii*), black oak (*Q. velutina*), white oak (*Q. alba*), bur oak (*Q. macrocarpa*), shagbark hickory (*Carya ovata*), honey locust (*Gleditsia triacanthos*) and black walnut (*Juglans nigra*). The shrub layer would be relatively sparse, but might include: New Jersey tea (*Ceanothus americana*), burning bush (*Euonymus atropurpurea*), buffalo berry (*Shepherdia canadensis*), and snowberry (*Symphoricarpos alba*). The open canopy and subsequent abundant light reaching the ground would allow for a diverse and productive forb and grass layer, characteristic of savannahs. Understory species typical of savannah habitats might include: appendaged waterleaf (*Hydrophyllum appendiculatum*), bastard toadflax (*Commandra umbellata*), wild columbine (*Aquilegia canadensis*), sweet cicely (*Osmorhiza claytonii*, *O. longistylis*), phlox (*Phlox divaricata*), woodland lettuce (*Lactuca floridana*), thimbleweed (*Anemone cylindrica*), hairy bedstraw (*Galium pilosum*), flowering spurge (*Euphorbia corollata*), Solomon’s seal (*Polygonatum pubescens*), and Short’s aster (*Aster shortii*). This

should be the most prevalent wooded community on the dune system between the west beach and the marsh.

The savannah would indiscernibly grade into relatively small enclaves of deciduous woodland where the canopy is more closed, and species more typical of eastern deciduous forest prevail, including: sugar maple (*Acer saccharum* ssp. *saccharum*), red oak (*Quercus rubra*), bitternut hickory (*Carya cordiformis*), basswood (*Tilia americana*), white ash (*Fraxinus americana*) and blue ash (*F. quadrangulata*). The subcanopy would be sparse and support smaller trees such as: hop-hornbeam (*Ostrya virginiana*), red mulberry, and blue ash. Even within this unit the canopy is variable, and the more closed areas within the woodland areas of the park would support ground cover species such as: trillium (*Trillium grandiflorum*), wild leek (*Allium tricoccum*), and wood fern (*Dryopteris intermedia*) where light levels are too low for the savannah forbs to dominate. However, much of the woodland would still be open enough to support many of the forb species found in the savannah. Hackberry (*Celtis occidentalis*) may occur as a minor component throughout the western arm of the park, left over from the post-disturbance colonization of the drier areas of the Point.

The woodland would not form a continuous zone between the savannah and the sand barren (as might be interpreted from Figure 2), but would occur in discontinuous patches. The woodlands would occur back from the main dune, in areas more sheltered from storms, possibly where more organic material accumulated, and where the periodic fires would intrude less frequently, owing to higher moisture and other factors.

4.4.2 Goal

To restore the native savannah and open woodlands of Point Pelee National Park, as representative examples of the sand peninsula vegetation of the western basin of Lake Erie.

4.4.3 Objectives

1. Develop and implement a Fire Management Plan (FMP) to re-instate fire as the primary means of restoring and managing vegetation at Point Pelee.
2. Decrease the amount of closed canopy forest that has developed over the last 30 years at Point Pelee.
3. Increase the abundance of native savannah and woodland grasses and forbs in the Park.
4. Decrease the dominance of common hackberry in the dryland forest, replacing it with tree species typical of savannahs and open woodlands.
5. Strengthen the connection between the natural and cultural understanding of the Park by integrating the re-introduction of fire as a management tool with the interpretive message regarding the role and influence of the First Nation peoples on the Point.

4.4.4 Units from 1990 Vegetation Management Objectives

This vegetation community includes the following vegetation units from Map 1 of the 1990 VMOs (Landplan 1990).

Upland Forest - mature: Units 1-3

Upland Forest - immature: Units 1-2 and a portion of Unit 4

Old Field - open: Unit 3

Anthropogenic: Units 1, 2, 4, 5, 8-10, 15, 19 and a portion of 6

4.4.5 Management Actions

1. Develop a Fire Management Plan (FMP) to: identify the areas that are a priority for burning, set timelines and protocols for prescribed burns, identify baseline and monitoring needs (possibly using plots from the Carolinian Forest Monitoring), identify assets requiring protection and address other issues as noted below, *etc.* This should be done in a timely manner to avoid further loss of SAR and other elements of biodiversity through canopy closure. (H)
2. Identify remnant savannah and woodlands with the highest Mean Coefficient of Conservatism (mean C) as a means of prioritizing sites for restoration. (H)
3. Develop an interpretive message that emphasizes the link between the ecology and vegetation of the Park with the historic land management protection of First Nations. (H)
4. Develop a strategy for restoring cottage sites, building on the existing *Site Restoration Management Manual* (Dunster 1990b), and which is consistent with ongoing research. The strategy should include:
 - establishing warm season grasses to build up organic carbon;
 - removal of major deposits of non-native surface materials; and
 - integration into the FMP. (L)

4.4.6 Management Considerations

1. Have regard for wildlife that may be threatened by fire, for instance cavity and ground nesters (*e.g.*, eastern mole and five-lined skink), and hibernating snakes.
2. Leave fallen deadwood in place, unless removal is required to reduce fuel loads. This should be addressed in the FMP.
3. Where possible use plants of local provenance for restoration.
4. The spread and potential impacts of the emerald ash borer should be monitored, with regard for the larger monitoring program occurring outside of the Park, and any possible mitigation strategies implemented if deemed warranted.
5. Potential impacts of poison ivy when burned.

4.4.7 Associated Species At Risk

1. Management in the savannah/woodland unit should have regard for the SAR listed in Table 1.
2. Potential impacts of prescribed burns on five-lined skink and eastern mole should be addressed in the FMP and mitigation proposed (*e.g.*, burn in blocks).
3. Determine potential impacts to southern flying squirrels, initially by checking to see if any are located in areas proposed for fire management.

4. Provide additional management specifically for red mulberry (e.g., removal of white mulberry).
5. The blue ash of Point Pelee National Park occur in fairly unique circumstances. Most other occurrences of this species are on thin soils over limestone or in floodplain situations. Genetic testing should be conducted to determine if these three site types are associated with distinct genetic differences in the blue ash population. All efforts should be made to protect the blue ash from emerald ash borer.

Table 3. Species At Risk known to occur in or expected to occupy the Savannah and Woodland. An asterisk indicates species considered extirpated from PPNP. SAR provided by the Park.

Insects	Mammals	Reptiles and Amphibians	Birds
Hackberry Emperor Tawny Emperor Giant Swallowtail Monarch	Eastern Mole Southern Flying Squirrel Red Squirrel* (conifer) Grey Fox* Groundhog*	Five-lined Skink Eastern Foxsnake Eastern Hog-nosed Snake* Milksnake* Eastern Ratsnake* Blue Racer* Massasauga*	Ruffed Grouse* Wild Turkey* Northern Bobwhite* Pileated Woodpecker* Acadian Flycatcher Carolina Wren Cerulean Warbler Hooded Warbler Eastern Yellow-breasted Chat Red-shouldered Hawk
Plants			
Sedge (<i>Carex albicans</i> var. <i>albicans</i>) Dwarf Hackberry (<i>Celtis tenuifolia</i>) Yellow Corydalis (<i>Corydalis flavula</i>) Burning Bush (<i>Euonymus atropurpurea</i>) Blue Ash (<i>Fraxinus quadrangulata</i>) Hairy Bedstraw (<i>Galium pilosum</i>) Honey Locust (<i>Gleditsia triacanthos</i>) [note not all locations are native] Appendaged Waterleaf (<i>Hydrophyllum appendiculatum</i>) Butternut (<i>Juglans cinerea</i>) Woodland Lettuce (<i>Lactuca floridana</i>) Red Mulberry (<i>Morus rubra</i>) Common Hop-tree (<i>Ptelea trifoliata</i>)			

4.5 Interior Sand Barren (Red Cedar Savannah)

An appropriate name for this open community has been problematical, but is referred to here as “sand barren” as, based on the information available, this is what it would key to in the ELC (Lee *et al.* 1998). This community has been referred to as “sand prairie” or “red cedar savannah” by Maycock (1977) and has long been known by the latter name. This open habitat would occur on the higher, central ridge that extends from near the Tip (the area known as the “Sparrow Field”), to north of DeLaurier, and which was aptly described by Maycock (1977) as the “interior sand plain”. At present, this habitat is restricted to relatively few, small patches. However, based on the soils, physiography and microclimate of PPNP, and the understanding that fire was historically more prevalent, the vegetation specialists at the workshop agreed that this community would be more widespread, and would constitute one of the defining communities at

Point Pelee National Park. The interior sand plain is hotter and drier than the wooded dunes. The internal topography would be comprised of shallow swales and low ridges, much like the present day area north of the DeLaurier parking lot. As noted above, sand barren vegetation may also occur to a limited extent on the east and west barrier beaches, especially at its wider points such as adjacent to Lake Pond.

4.5.1 Vision

The vegetation of the interior sand plain would be characterized by open sand barren, with scattered shrub thickets, red cedar glades and possibly some abandoned agricultural fields (some cultural old field will likely be retained for interpretive purposes). The sand barrens would provide habitat for many of the rarest plants in the Park including: eastern few-fruited sedge (*Carex oligocarpa*), Carolina whitlow-grass (*Draba reptans*), eastern prickly pear cactus, fringed puccoon (*Lithospermum incisum*), climbing prairie rose (*Rosa setigera*), and wild potato vine (*Ipomoea pandurata*), as well as more common sand barren species such as: Heller's witchgrass (*Panicum oligosanthos*) sand dropseed, little bluestem, switch grass, plains puccoon, wild bergamot (*Monarda fistulosa*), butterfly milkweed (*Asclepias tuberosa*), New Jersey tea and fragrant sumac. Red cedar (*Juniperus virginiana*) and common juniper (*J. communis*) are common colonizers of the open sand, and in areas where they escape the frequent ground fires, red cedar could form open-canopied, savannah-like stands within the sand barrens. Shrub thickets composed principally of Drummond's dogwood and gray dogwood (*C. racemosa*) would be interspersed throughout. Some widely scattered, open-grown trees may exist in some areas, creating a complex mosaic of habitats ranging from open sand to very open savannah.

The savannah and central open areas would be maintained through periodic burning, emulating First Nation's land management practices, along with natural lightning strikes, to control the red cedar glades and dogwood thickets that would otherwise dominate and form closed-canopy communities. The mosaic of open areas, shrub thickets and occasional trees would not only provide conditions for many rare plants, but also provide habitat for disturbance-dependent bird species. Several of these are significant, such as the eastern yellow-breasted chat and white-eyed vireo. These and other species of open habitats (cuckoos, thrashers, *etc.*) would be expected to increase in abundance.

4.5.2 Goal

To create a substantial area of sand barren, and associated shrub thicket and red cedar within the interior sand plain.

4.5.3 Objectives

1. Restore the area extending approximately from DeLaurier south to the tip, along the interior sand plain, to a mosaic of open habitats which would include: open sand barren, dogwood shrub thickets and park-like cedar glades, using fire as the primary management tool.
2. Develop fire prescriptions, approaches and protocols through a Fire Management Plan (see section 4.5.5).
3. Substantially increase the populations of relevant SAR (see table 2) through restoration of sand barren.

4. Restore the topography of the interior sand plain, using the area just north of the DeLaurier parking area as a template.
5. Develop a strategy for addressing DDT in the Park.
6. Strengthen the connection between the natural and cultural understanding of the Park by integrating the re-introduction of fire as a management tool with the interpretive message regarding the role and influence of the First Nation peoples on the Point.
7. Evaluate the area to the north of DeLaurier (extending to the marsh boardwalk) for its suitability for restoration to Sand Barren and revise Vision Map accordingly.

4.5.4 Units from 1990 Vegetation Management Objectives

This vegetation community includes the following vegetation units from Map 1 of the 1990 VMOs (Landplan 1990).

- Upland Forest - mature: portions of Units 1-2
- Upland Forest - immature: a portion of Unit 2, 3-5, 7-9
- Old Field - shrub: Units 1-4
- Old Field - open: Unit 2, 4
- Anthropogenic: Units 7, 11, 13, 14, 16, and a portion of 6

4.5.5 Management Actions

1. Use the recommendations in the *Red Cedar Savannah Restoration Plan* (Geomatics 1994) and *Restoration of a Savanna Habitat in Point Pelee National Park, Southwestern Ontario* (Falkenberg 2000) as a basis for moving forward to restore this vegetation type in the Park. (H)
2. Develop a Fire Management Plan (FMP), consistent with the recommended Vegetation Management Plan (see section 9.2), to identify the areas that are a priority for burning, set timelines and protocols for prescribed burns, identify baseline and monitoring needs (possibly using plots from the Carolinian Forest Monitoring), identify assets requiring protection and address other issues as noted below. This should be done in a timely manner to avoid further loss of SAR and other elements of biodiversity through canopy closure. (H)
3. Assess the feasibility of restoring the topography of the area proposed for sand barren. (M)
4. Continue to collect information and where appropriate undertake studies on how to address the DDT “hotspots” and potential effects on human and wildlife health. (M)
5. Evaluate the area north of DeLaurier to the marsh boardwalk for its suitability for restoration to sand barren. (L)

4.5.6 Management Considerations

1. Potential impacts of poison ivy when burned.
2. As part of gaining as good an understanding as possible of the former extent of sand barren, include judicious use of Klugh’s 1907 map of the distribution of red cedar in the park (see Battin and Nelson 1978, page 93).
3. Have regard for wildlife that may be threatened by fire, for instance cavity and ground nesters (e.g., eastern moles and five-lined skinks), and hibernating snakes.

4. Leave fallen deadwood in place, unless removal is required to reduce fuel loads. This should be addressed in the FMP.
5. Consider potential impacts from “stirring up” DDT that has started to migrate down through soil column.
6. The spread and potential impacts of the emerald ash borer should be monitored, with regard for the larger monitoring program occurring outside of the Park, and any possible mitigation strategies implemented if deemed warranted.

4.5.7 Associated Species At Risk

1. Potential impacts of prescribed burns on five-lined skink and eastern mole should be addressed in the FMP and mitigation proposed (e.g., burn in blocks).
2. Have regard for dwarf hackberry and eastern prickly pear cactus as they may not be fire tolerant.
3. Determine potential impacts to southern flying squirrels, initially by checking to see if any are located in areas proposed for fire management.

Table 4. Species At Risk known to occur in or expected to occupy the Interior Sand Barren. An asterisk indicates species considered extirpated from PPNP. SAR provided by the Park.

Insects	Mammals	Reptiles and Amphibians	Birds
Juniper Hairstreak Giant Swallowtail Monarch	Eastern Mole Groundhog* Grey Fox*	Five-lined Skink Eastern Foxsnake Milksnake* Eastern Hog-nosed Snake* Eastern Ratsnake* Blue Racer* Massasauga*	White-eyed Vireo Eastern Yellow-breasted Chat Wild Turkey* Northern Bobwhite* Henslow’s Sparrow Short-eared Owl
Plants			
Dwarf Hackberry (<i>Celtis tenuifolia</i>) Eastern Few-fruited Sedge (<i>Carex oligocarpa</i>) Carolina Whitflow-grass (<i>Draba reptans</i>) Flowering Spurge (<i>Euphorbia corollata</i>) Wild Potato Vine (<i>Ipomoea pandurata</i>) Fringed Puccoon (<i>Lithospermum incisum</i>) Eastern Prickly Pear Cactus (<i>Opuntia humifusa</i>) Heller’s Witchgrass (<i>Panicum oligosanthes</i>) Climbing Prairie Rose (<i>Rosa setigera</i>) Great Plains Ladies’ Tresses (<i>Spiranthes magnicamporum</i>)			

4.6 Swamp Forest

Toward the south end of PPNP, the eastern flank of the interior sand plain grades into well-defined “ridge and trough” topography, with species less tolerant of flooding occupying the ridges, and swamp species occurring in the troughs. This vegetation type extends northward, but the ridges and troughs become less well pronounced east of the Visitor’s Centre, and become a series of shallow sloughs and low ridges in Tilden’s Woods.

4.6.1 Vision

Tree species on the ridges would include: common hackberry, basswood, black walnut, silver maple (*Acer saccharinum*), and green ash (*Fraxinus pennsylvanica*) with the occasional sycamore (*Platanus occidentalis*). The sloughs would contain more, and much larger silver maple, with green ash and American elm (*Ulmus americana*), and scattered basswood, common hackberry, black ash (*F. nigra*) and cottonwood (*Populus deltoides*). Spicebush (*Lindera benzoin*) would likely be common in the shrub layer along with silky dogwood (*Cornus obliqua*), and buttonbush (*Cephalanthus occidentalis*).

4.6.2 Goal

To preserve an example of swamp forest typical of the Carolinian Life Zone, supporting a high diversity of tree species, and the ridge and trough topography characteristic of the sand peninsulas of Lake Erie.

4.6.3 Objectives

1. Increase the extent of this forest through the restoration of ridge and trough topography and, to the extent possible hydrology, north to Tilden's Woods.
2. Maintain the water levels in the swamp forest within the natural range of variation.

4.6.4 Units from 1990 Vegetation Management Objectives

This vegetation community includes the following vegetation units from Map 1 of the 1990 VMOs (Landplan 1990).

Swamp Forest: Unit 1

Swamp Thicket: Unit 2 and a portion of Unit 1

Upland Forest - mature: Unit 4

Upland Forest - immature: Unit 6

4.6.5 Management Actions

1. Develop a Restoration Plan to re-establish the original ridge and trough topography and, to the extent possible, hydrology north to Tilden's Woods. In particular, the barrier to hydrology presented by Shuster's Trail needs to be removed. The initiative to restore the area north of the former East Beach Road should initially involve evaluating the intervening shrub thicket to see if tree species typical of swamps are establishing there per the 1990 VMO (Landplan 1990 pg. 25), and if warranted in the Restoration Plan include planting appropriate tree species. (H)
2. Monitor the water levels in the troughs (sloughs) on a seasonal basis and over the long-term, to establish the current range of variation. These should be correlated to historical observations, and to water levels in Lake Erie to determine if the current drying trend is within the natural range of variation. (H)

4.6.6 Management Considerations

1. This unit does not appear to be suffering from human-related disturbance, thus no restoration or management needs (other than those noted in section 4.6.5 above) were identified by workshop participants (this was the same response as in the 1990 VMOs Workshop).

2. The drying trend and absence of water has been suggested as an issue, but interestingly, increasing water levels were voiced as a concern in the 1990 VMOs workshop (Landplan 1990). The fluctuating water levels are likely an inherent characteristic of this community, however, as noted in the objectives, they should be monitored and correlated with the lake levels, so that any abnormal fluctuations can be identified in the future.
3. The spread and potential impacts of the emerald ash borer should be monitored, with regard for the larger monitoring program occurring outside of the Park, and any possible mitigation strategies implemented if deemed warranted.

4.6.7 Associated Species At Risk

Table 5. Species At Risk known to occur in or expected to occupy the Swamp Forest. An asterix indicates species considered extirpated from PPNP. SAR provided by the Park.

Insects	Mammals	Reptiles and Amphibians	Birds
Giant Swallowtail Monarch	Grey Fox* Southern Flying Squirrel	Gray Treefrog Spotted Turtle* Blanding’s Turtle	Red-headed Woodpecker Prothonotary Warbler Louisiana Waterthrush Pileated Woodpecker

4.7 Thicket Swamp and Wet Meadow

Where the open, central sand plain interfaces with the marsh, a complex of dense swamp thickets and wet meadow could be restored. Where gradients are fairly abrupt, and there is a rapid transition from the sand barrens to standing water, buttonbush thickets would likely prevail. At present, this is accentuated by the existing drainage canals that were dug to improve farming conditions. These canals should be restored to the natural topography, with a grade that will promote more natural zonation of vegetation. A gradual transition will allow for the development of wet meadows. The potential impacts and benefits of such management for reptiles and amphibians should be addressed in any restoration plans, as research has shown that some of the largest concentrations of some species (e.g., Blanding’s turtles) are found in these canals.

4.7.1 Vision

The vegetation zone east of the sand barren would be a mosaic of swamp thickets interspersed with wet meadows that occur along a gradual rise from the marsh to the interior sand plain. The thickets would be composed of willows (*Salix* spp.), dogwoods (*Cornus* spp.) and buttonbush, as they are at present. The wet meadows would be used by reptiles and amphibians for foraging, and provide a connection to nesting habitat in the sand plain for the latter. The wet meadows may support species such as tussock sedge (*Carex stricta*) at the wetter (lower) end of the gradient, and grade into common meadow species such fowl manna grass (*Glyceria striata*), Joepye weed (*Eupatorium maculatum*) and blue vervain (*Verbena hastata*). It may also restore habitat for species that favour fen-like habitats such as slender fimbry (*Fimbristylis autumnalis*) and shining ladies tresses (*Spiranthes lucida*).

4.7.2 Goal

To provide a natural transition zone from the marsh to the sand barrens of the interior sand plain that supports a mosaic of buttonbush thickets and wet meadow.

4.7.3 Objectives

1. Restore and maintain areas of swamp thicket as part of providing a transition to the sand barren vegetation that occurs on the interior sand plain.
2. Restore the area currently occupied by shrub thicket between the swamp forest and Tilden's Woods as noted in section 4.6.
3. Remove non-natives with a priority placed on common reed and European frogbit.
4. Map the location and extent of wet meadow in the marsh, with priority on the marsh edges from the Marsh Boardwalk south to the end of the marsh.
5. Determine the feasibility of restoring at least some of the dug canals to: 1) restore the natural hydrologic gradient between the marsh and the interior sand plain, 2) provide conditions for the establishment of natural vegetation zones ranging from meadow marsh through to wet meadow; and 3) provide fen-like habitat within the meadows (depending on the results and knowledge gained from Objective 3 above).
6. Restore any hydrogeological relationships between the sand plain and the adjacent marsh with respect to local recharge/discharge systems, and the extent to which these may have originally support fen-like conditions in the marsh where it abuts the sand plain (also see section 4.8.3 #6).

4.7.4 Units from 1990 Vegetation Management Objectives

This vegetation community includes the following vegetation units from Map 1 of the 1990 VMOs (Landplan 1990).

Wet Meadow: Unit 1

Swamp Thicket: Unit 1 and a small portion of Unit 2

4.7.5 Management Actions

1. Prepare a Restoration Plan to restore the existing shrub thicket between the swamp forest and Tilden's Woods to swamp forest, in conjunction with the Restoration Plan for the re-establishment of the ridge and trough topography in this area. (H)
2. Continue to implement the Exotic Species Management Plan (Dunster 1990a) with priority on common reed and European frogbit. (H)
3. Undertake a study to map the location and extent of wet meadow in the Park, especially along the area adjacent to the interior sand plain, as this is necessary to formulate any restoration initiative. This may be done as part of the overall updating of vegetation mapping in the Park (see sections 9.1 #3 and 9.2 #5). (M)
4. Assess the feasibility of removing the dug canals, and restoring the natural topography, including determination of the cost/benefits of restoration to wildlife. (M)
5. Initiate a hydrological investigation to determine the relationship between the sand plain and the marsh. This may involve the installation of nested piezometers and determination of direction and volume of groundwater flow, and characterization of stratigraphy in this area. Determine the extent to which these may have originally supported fen-like conditions in the marsh where it abuts the sand. This should also include a review of

historic vegetation documentation to determine if fen-like species were found in these areas). (L)

4.7.6 Management Considerations

1. As with the swamp forest, concern has been expressed over a drying trend in the canals, however, this may be part of natural cycles in the Great Lakes, and the objectives for the swamp forest would help identify this.
2. It was noted at the 2003 VMOs Workshop that this vegetation type is poorly mapped in the Park and that there should be more wet meadow in the Park. This vegetation type has probably been impacted by past activities such as drainage to provide more opportunities for agriculture and development of cottages adjacent to the marsh.
3. Concern was raised at the workshop that the canals are now used by turtles, especially Blanding’s Turtles. Potential impacts on turtles would have to be determined as part of the overall decision to restore the original topography and drainage.

4.7.7 Associated Species At Risk

1. Prothonotary warblers may use the swamp thickets, and thus should be investigated as part of any proposed restoration.

Table 6. Species At Risk known to occur in or expected to occupy the Thicket Swamp and Wet Meadow. An asterix indicates species considered extirpated from PPNP. SAR provided by the Park.

Insects	Mammals	Reptiles and Amphibians	Birds
Giant Swallowtail Monarch Duke’s Skipper	Grey Fox*	Gray Treefrog Blanding’s Turtle Spotted Turtle* Blue Racer* Eastern Foxsnake Massasauga*	Prothonotary Warbler Louisiana Waterthrush
Plants			
Burning Bush (<i>Euonymus atropurpurea</i>) Slender Fimbry (<i>Fimbristylis autumnalis</i>)			

4.8 Marsh

4.8.1 Vision

The marsh would continue to be dominated by cattails (*Typha* spp.) and contain the eight major ponds, most of which are joined by shallow channels. To the south, there would be wet meadow and meadow marsh areas that eventually give way to the ridge and trough swamp. The meadow marsh in the south would include sedge meadows such as tussock sedge, and would be more open than the cattail mat. There would be a greater interspersion of the cattail mat (which is currently quite dense), meadow marsh and open water. Fire may be used to create this more open marsh, however, investigation into the timing of the fires would have to be undertaken. Some openings might also be maintained through periodic, naturally occurring breaches in the

east barrier beach, especially in the vicinity of Lake Pond, Redhead Pond and Bush Pond. The ecotones between the ponds and channels, and the adjacent marsh would provide habitat for rare species such as swamp rose mallow (*Hibiscus moscheutos*), as well as rich habitat for wetland birds.

Ideally, if the lands to the north of the park were ever restored, historic drainage systems might be reconnected, to restore former hydrological processes, however, this should only be done after careful consideration of the impacts of the many years of agriculture, and probable applications of chemicals and fertilizers in that area.

4.8.2 Goal

To restore a heterogeneous marsh ecosystem as a representative example of a lower Great Lakes Marsh, that is composed primarily of cattail mat interspersed with open water and meadow marsh, and that is ecologically linked to Hillman Marsh to the north.

4.8.3 Objectives

1. Increase the interspersion of open water and emergent marsh such that it will benefit biodiversity.
2. Develop and implement a Fire Management Plan (FMP) for the marsh to re-instate fire as one of the primary means of restoring and managing marsh vegetation at Point Pelee.
3. Remove or control exotic plants: common reed (*Phragmites australis*), purple loosestrife and European frogbit (*Hydrocharis morus-ranae*).
4. In general, do not interfere with natural breaches to the barrier beach (it is recognized that there could be situations not foreseen in this study that may require intervention).
5. Evaluate the feasibility of re-establishing the historic connections to the drainages north of the Park, including re-connection with Hillman Marsh.
6. Determine the hydrological relationship, if any, between the marsh and adjacent sand barrens to the west, with respect to local recharge/discharge systems (also see section 4.7.3 #6).
7. Remove or control exotic fish, especially carp, in the marsh.
8. Eliminate possible impacts on water quality associated with eutrophication from old, decaying septic systems, and the old dump in the marsh.

4.8.4 Units from 1990 Vegetation Management Objectives

This vegetation community includes the following vegetation units from Map 1 of the 1990 VMOs (Landplan 1990).

Marsh: Unit 1

Pond Edge: Units 1-10

Pond Open Water: Units 1-10

4.8.5 Management Actions

1. Evaluate habitat requirements of marsh wildlife to determine the optimum interspersion that will benefit the biodiversity in the marsh. For example, 50% interspersion is considered optimal based on the Ontario Wetland Evaluation System (OMNR 1993). (H)

2. Develop a Fire Management Plan (FMP), consistent with the recommended Vegetation Management Plan (see section 9.2), to manage interspersions of cattails and open water in the marsh. This plan should identify the areas that are a priority for burning, set timelines and protocols for prescribed burns, identify baseline and monitoring needs, identify assets requiring protection and address other issues as noted below. This should be done in a timely manner to avoid further loss of biodiversity (including SAR species). This Plan should be distinct from the FMP recommended for the dryland portions of the Park. (H)
3. Monitor and control common reed, purple loosestrife and European frogbit, consistent with the Park-wide implementation of the Exotic Species Management Plan (Dunster 1990a). (H)
4. Record and monitor barrier beach breaching events. (H)
5. Establish regional partnerships with the objective of re-establishing an ecological connection to Hillman Marsh. Through these partnerships also investigate the feasibility of re-establishing the historic drainage connections north of the Park and identify the prerequisite conditions for this initiative to be pursued. (H)
6. Investigate the presence of seepage zones in the marsh, and the presence of any of associated calciphiles that have been reported in Jellicoe (1984). (M)
7. Conduct a study to determine the hydrological relationship, if any, between the marsh and adjacent sand barrens to the west (also see section 4.7.5 #5). (M)
8. Assess the feasibility of removing or controlling numbers of carp in the marsh. Contact the Royal Botanical Gardens (RBG) to discuss their experience with carp control in Cootes Paradise. (L)
9. Investigate the potential impacts on water quality associated with eutrophication from old, decaying septic systems and develop a mitigation plan to eliminate the impacts. (L)
10. Investigate potential impacts and mitigation associated with the old dump in the marsh. (L)

4.8.6 Management Considerations

1. Practicality and feasibility of reducing the amount of the hybrid cattail (*Typha x glauca*) and increasing the indigenous broad-leaved cattail (*T. latifolia*).
2. Investigate the possibility of DDT “hotspots” in the marsh resulting from former insect control programs (note: research in the Park in the 1990s did not identify any).
3. Instability of the East Beach associated with the altered sand budget resulting from historic sand mining off Point Pelee and hardening of the shoreline north of the Park.
4. Need to recognize long term high and low water levels in the marsh resulting from cycles in Lake Erie. This is not a concern as it is a natural disturbance, but is noted as a possible issue for some management initiatives (e.g., burning).
5. Difficulty in finding a practical way of controlling the number of carp in the marsh.
6. Potential impacts of poison ivy when burned.

4.8.7 Associated Species At Risk

Table 7. Species At Risk known to occur in or expected to occupy the Marsh. An asterix indicates species considered extirpated from PPNP. SAR provided by the Park.

Insects	Fish	Reptiles and Amphibians	Birds	Mammals
Duke's Skipper Giant Swallowtail Monarch	Spotted Gar Pugnose Shiner* Lake Chubsucker Bigmouth Buffalo Black Bullhead Grass Pickerel Warmouth	Mudpuppy* Gray Treefrog Northern Cricket Frog* American Bullfrog* Fowler's Toad* Stinkpot Spotted Turtle* Northern Map Turtle Spiny Softshell Blanding's Turtle Eastern Foxsnake	Least Bittern Peregrine Falcon Bald Eagle King Rail* Caspian Tern Forster's Tern Black Tern Short-eared Owl	Grey Fox* American Beaver
Plants				
Southern Tickseed (<i>Bidens coronata</i>) Smartweed Dodder (<i>Cuscuta polygonorum</i>)* Swamp Rose Mallow (<i>Hibiscus moscheutos</i> ssp. <i>moscheutos</i>) American Water-willow (<i>Justicia americana</i>) Yellow Pond Lily (<i>Nuphar advena</i>) Sessile-fruited Arrowhead (<i>Sagittaria rigida</i>) Branching Bur-reed (<i>Sparganium angrocladum</i>)				

4.9 East Beach Wet Meadows

Although this vegetation management unit was included in the 1990 VMO, it was not discussed at the 2003 Vegetation Management Workshop. The following goal, objectives, *etc.* should thus be considered preliminary and should be reviewed as more information on this vegetation unit is determined.

4.9.1 Vision

Where the east beach abuts with the marsh, wet meadows would occur. These meadows are currently, and would continue to be rare in the Park. Several significant species such as Smith's club-rush (*Scirpus smithii*), red-rooted nut-sedge, southern tickseed (*Bidens coronata*), American water-willow (*Justicia americana*) and slender fimbry would be found in them. The east beach would also support a limited area of sand barren, but both this community, and the wet meadows would be transient, depending on water levels in Lake Erie, the sand budget and storm events.

4.9.2 Goal

To preserve examples of wet, calcareous meadows which occurred at the interface between the marsh and the east beach.

4.9.3 Objectives

1. Map the location and extent of wet meadow along the East Beach.
2. Determine the factors impacting this vegetation unit and the feasibility of restoring this unit along the East Beach.

3. Ensure that no potential park management activities impact on these small and scarce vegetation units.

4.9.4 Units from 1990 Vegetation Management Objectives

This vegetation community includes the following vegetation units from Map 1 of the 1990 VMOs (Landplan 1990).

Wet Meadow Unit 2

4.9.5 Management Actions

1. Investigate and map the current extent of wet meadows on along the east beach where it intersects with the marsh, including updating the status of the significant species recorded by Varga (1984) slender fimbry, red-rooted nut-sedge, southern tickseed and American water-willow. (H)
2. Determine the impacts to this vegetation unit and assess the feasibility of restoring this unit along the East Beach. (M)

4.9.6 Management Considerations

None known

4.9.7 Associated Species At Risk

Table 8. Species At Risk known to occur in or expected to occupy the East Beach Wet Meadows. An asterisk indicates species considered extirpated from PPNP. SAR provided by the Park.

Insects	Mammals	Reptiles and Amphibians
Giant Swallowtail Monarch Juniper Hairstreak Gray Hairstreak	Grey Fox*	Fowler’s Toad* Spiny Softshell Eastern Foxsnake Eastern Hog-nosed Snake* Eastern Ratsnake* Blue Racer* Massasauga* Stinkpot Spotted Turtle* Northern Map Turtle Blanding’s Turtle
Plants		
Red-rooted Nut-sedge (<i>Cyperus erythrorhizos</i>) Smith’s Club-rush (<i>Scirpus smithii</i>) Southern tickseed (<i>Bidens coronata</i>) American water-willow (<i>Justicia americana</i>)		

4.10 Cultural Old Field (at DeLaurier House)

4.10.1 Vision

The cultural old field habitat would provide a visual representation of an altered landscape comparable to that which would have existed during the early settlement of the Point. It should be compatible with the cultural interpretative messages being provided at the DeLaurier homestead.

4.10.2 Goal

Provide a small (1 ha) example of cultural old field consistent with the interpretation of the cultural history of the Park.

4.10.3 Objectives

1. Maintain approximately 1 hectare of open field in the vicinity of DeLaurier House.
2. Maintain some native shrub thicket in the same area to provide habitat for SAR such as eastern yellow-breasted chat and white-eyed vireo.

4.10.4 Units from Existing Vegetation Management Objectives

This vegetation community includes the following vegetation units from Map 1 of the 1990 VMOs (Landplan 1990)

Anthropogenic: Unit 11

4.10.5 Management Actions

1. Develop a Management Plan to maintain a small area of open field in the vicinity of DeLaurier House. Include maintenance of some native shrub thicket adjacent to the old field to provide habitat for SAR such as eastern yellow-breasted chat and white-eyed vireo. This can be done in conjunction, or as part of the upcoming review of interpretive assets and associated interpretive themes of DeLaurier House. (M)
2. Conduct research to determine whether there are native surrogates for the plant species that typically occur in abandoned agricultural fields that would give a visual impression suitable for interpretation. (L)

4.10.6 Management Considerations

1. Beware of issues related to possible DDT hotspots.

4.10.7 Associated Species At Risk

1. Investigate the appropriateness of re-introducing climbing prairie rose (*Rosa setigera*) as a cultural feature.

Table 9. Species At Risk known to occur in or expected to occupy the Cultural Old Field (De Laurier House). An asterisk indicates species considered extirpated from PPNP. SAR provided by the Park.

Insects	Mammals	Reptiles and Amphibians	Birds
Monarch Tawny-edged Skipper*	Groundhog* Grey Fox* Eastern Mole	Eastern Foxsnake Eastern Ratsnake*	Northern Bobwhite* Eastern Yellow-breasted Chat White-eyed Vireo Henslow's Sparrow*
Plants			
Trumpet Creeper (<i>Campsis radicans</i>) Wild Potato Vine (<i>Ipomoea pandurata</i>)			

5.0 VEGETATION MANAGEMENT OBJECTIVES - MIDDLE ISLAND

Although vegetation communities have been mapped for Middle Island (North-South Environmental 2004b), there has been no discussion on the direction for managing them on a community by community basis. For this reason, objectives and actions are provided for the Island as whole. The vision for Middle Island is outlined in section 2.2.

5.1 Goal

Maintain a mosaic of successional vegetation communities on Middle Island that reflect its southern affinities (representative of the western Lake Erie islands) and which will continue to support the many significant species that occur there.

5.2 Objectives

1. Maintain natural disturbance regimes.
2. Minimize the impacts of nesting double-crested cormorants on the Island in cooperation with other resource management agencies in the western Lake Erie basin.
3. Remove non-native species from the Island.

5.3 Units from Existing Vegetation Management Objectives

None, as Middle Island was not part of Point Pelee National Park when the 1990 VMOs were written.

5.4 Management Actions

1. Undertake a Vegetation Management Plan for Middle Island. Include determination of the role of natural disturbances that impact the vegetation, and strategies for maintaining disturbances. (H)
2. Pursue strategies for controlling cormorant populations on Middle Island, including developing partnerships with other Great Lakes organizations (Canadian and American) who are addressing similar issues with respect to cormorants. (H)
3. Develop plans for the control of non-native plants on Middle Island. This may constitute an addendum to the existing plan for the Park. (L)

5.5 Management Considerations

1. Occasional disturbance should be considered a normal part of the Island's successional processes, and impacts from these disturbances (particularly those that open the canopy) should be considered of benefit in conserving the diversity of vegetation.
2. Restoration efforts should be focused on the removal of non-native species, especially those that can be removed without impacting soils. For example, cutting out Norway maple (*Acer platanoides*) and white mulberry (*Morus alba*). Removal of white mulberry to minimize hybridization with the endangered red mulberry should be considered as a first priority and should continue on an ongoing basis.
3. Management actions to discourage cormorants from nesting on the island should be developed, as their guano impacts a large component of the flora, especially from forest and marsh communities. This initiative should include liaison with international and national efforts to manage cormorants on the Great Lakes, and support for and adoption of lake-wide management strategies as they are developed for Lake Erie.

5.6 Associated Species At Risk

Table 10. Species At Risk known to occur in or expected to occupy Middle Island. An asterix indicates species considered extirpated from Middle Island. SAR provided by the Park.

Reptiles and Amphibians	Birds
Lake Erie Water Snake	Great Egret Black-crowned Night-heron Caspian Tern
Plants	
Toothed Rock-cress (<i>Arabis shortii</i>)	Honey Locust (<i>Gleditsia triacanthos</i>)
Wild Hyacinth (<i>Camassia scilloides</i>)	Kentucky Coffee-tree (<i>Gymnocladus dioica</i>)
Clustered Sedge (<i>Carex aggregata</i>)	Rock-geranium (<i>Heuchera americana</i>)
Davis' Sedge (<i>Carex davisii</i>)	Appendaged Water leaf (<i>Hydrophyllum appendiculatum</i>)
Frank's Sedge (<i>Carex frankii</i>)*	American Water-willow (<i>Justicia americana</i>)*
Nebraska Sedge (<i>Carex jamesii</i>)	Woodland Lettuce (<i>Lactuca floridana</i>)
Creeping Chervil (<i>Chaerophyllum procumbens</i>)	Miami Mist (<i>Phacelia purshii</i>)
Standley Goosefoot (<i>Chenopodium standleyanum</i>)	Common Hop-tree (<i>Ptelea trifoliata</i>)
Yellow Corydalis (<i>Corydalis flavula</i>)	Red Mulberry (<i>Morus rubra</i>)
Harbringer-of-spring (<i>Erigenia bulbosa</i>)	Scorpion Grass (<i>Myosotis macrosperma</i>)
Burning Bush (<i>Euonymus atropurpurea</i>)	Trailing Wild Bean (<i>Strophostyles helvola</i>)
Blue Ash (<i>Fraxinus quadrangulata</i>)	Upright Carrion Flower (<i>Smilax ecirrata</i>)*
Spring Avens (<i>Geum vernum</i>)	

6.0 VEGETATION MANAGEMENT OBJECTIVES - STURGEON CREEK

The vision for Sturgeon Creek is outlined in section 2.3.

6.1 Goals

The primary goal of the Sturgeon Creek restoration is to establish a self-sustaining native forest vegetation mosaic that possesses a biodiversity and species composition similar to the remnant or historic record of the native biotic communities of the area.

In addition, the project will allow scientific evaluation of specific proposed methods or strategies to enhance restoration techniques for native habitat.

6.2 Objectives

1. Establish a native forest species canopy within 5-7 years.
2. Initiate ground cover and understory establishment subsequent to the canopy establishment.
3. Increase the biodiversity in the long-term (> 5 years) to so that the restoration resembles the species composition of the remnant or historical record of the native biotic community of the area.

6.3 Units from Existing Vegetation Management Objectives

None, as Sturgeon Creek was not managed as part of the Park when the 1990 VMOs were written.

6.4 Management Actions

1. Implement the Sturgeon Creek Restoration Plan (Parkinson 1991) including monitoring the survival and growth of planted trees. (L)

6.5 Management Considerations

None known

6.6 Associated Species At Risk

The following Species At Risk are known from Sturgeon Creek: red mulberry (*Morus rubra*), blue ash (*Fraxinus quadrangulata*), Kentucky coffee-tree (*Gymnocladus dioicus*), and common hop-tree (*Ptelea trifoliata*).

7.0 PLANT SPECIES OBJECTIVES - MAINLAND POINT PELEE

Most plant species at Point Pelee National Park do not require any management and specific objectives are not provided for them. However, particular groups of species such as SAR and non-native species may require management, and these are addressed here. The determination of objectives for particular species (*e.g.*, fringed puccoon or purple loosestrife) is beyond the intent of this report. Species-specific prescriptions and management responses have to be determined in species recovery plans or focused management plans. For the purposes of this report, species have been assembled into groups that will have similar broad management requirements. For example, the intent will be to remove all non-native plants from the Park, thus broad objectives are provided for that group as a whole. Species At Risk listed below were provided by Park staff.

7.1 Plant Species at Risk - Extirpated from Mainland Point Pelee National Park

These Species At Risk are documented as historically occurring at Point Pelee National Park or in the vicinity. The possibility of re-introducing these species to Point Pelee should be investigated, however, this should not be considered until the appropriate habitat in the Park has been restored.

7.1.1 Objective

1. Determine the desirability and feasibility of re-introducing extirpated species.

7.1.2 Species

There is only one plant species that is currently considered to be extirpated from the Park (based on information from Park staff). However, additional plants may be added to this list if confirmation of the location of historic observations cannot be made (see sections 7.5 and 7.6).

- Smartweed Dodder (*Cuscuta polygonorum*)

7.1.3 Management Actions

1. Search for smartweed dodder during searches undertaken for wild potato vine as it is an associated species. (H)
2. Develop generic guidelines or criteria to evaluate the desirability of re-introducing extirpated plant species to Point Pelee National Park. (M)
3. Evaluate Smartweed Dodder as a candidate for re-introduction. (L)

7.1.4 Management Considerations

1. Need to determine cause(s) of extirpation, and ensure that they no longer exist, or can be mitigated before attempting re-introduction. This will require some judgement to assess if causes are natural or human-related, either directly or indirectly. It may not be feasible or desirable to re-introduce species that have been extirpated owing to natural causes. Species should only be re-introduced if they can reasonably be expected to be self-sustaining without species-specific management.

7.2 Plant Species At Risk - Declining at Mainland Point Pelee National Park

These Species At Risk are currently known or believed to have declining populations, or are found in relatively few locations with low abundance at Point Pelee National Park. Most of these species are associated with savannah and/or sand barren habitat and are expected to increase in abundance with management for these communities.

7.2.1 Objective

1. Protect and preserve these species as an integral part of the natural vegetation of the Park.

7.2.2 Species

- Green Milkweed (*Asclepias viridiflora*)
- Southern Tickseed (*Bidens coronata*)
- Dwarf Hackberry (*Celtis tenuifolia*)
- Yellow Corydalis (*Corydalis flavula*)
- Red-rooted Nut-sedge (*Cyperus erythrorhizos*)
- Burning Bush (*Euonymus atropurpurea*)
- Flowering Spurge (*Euphorbia corollata*)
- Blue Ash (*Fraxinus quadrangulata*)
- Hairy Bedstraw (*Galium pilosum*)
- Honey Locust (*Gleditsia triacanthos*) (only those individuals that are naturally occurring)
- Woodland Lettuce (*Lactuca floridana*)

- Fringed Puccoon (*Lithospermum incisum*)
- Red Mulberry (*Morus rubra*)
- Eastern Prickly Pear Cactus (*Opuntia humifusa*)
- Bushy Cinquefoil (*Potentilla paradoxa*)
- Climbing Prairie Rose (*Rosa setigera*) [first documented in 1961, its status as a native species at the Park is considered questionable (Ambrose 1984)]
- Smith's Tufted Bulrush (*Scirpus smithii*)
- Slender Eight-flowered Fescue (*Vulpia octoflora*)

7.2.3 Management Actions

1. Evaluate the current status of each species in this category and implement temporary measures to secure any species that are in imminent danger of being extirpated from the Park. (H)
2. Determine cause(s) for the declines in these species. (H)
3. Prioritize actions for securing declining species based on the urgency for action that will prevent species becoming extirpated from the Park (see management concern #2 below). (H)
4. Implement the management actions associated with the VMOs in order to restore the habitat conditions (*e.g.*, vegetation communities) in which these species occur, thus providing sustainable conditions for their long-term persistence in the Park. (H)
5. Implement any species-specific management actions recommended in Recovery Plans. (H)
6. Undertake a white mulberry removal program in order to minimize hybridization with the endangered red mulberry. (H)

7.2.4 Management Considerations

1. It should be determined whether these species can be secured through management at the community level, *i.e.*, by restoring appropriate habitat conditions. Some species may require additional management intervention to stabilize their populations (*e.g.*, removal of white mulberry to prevent hybridization with the endangered red mulberry and subsequent loss of the red mulberry genes).
2. The limited resources for species-specific conservation need to be prioritized based on a number of factors that would include preventing species that are now secure from declining. This can largely be achieved through appropriate management at the community level. Generally, scarce resources should not be expended on species management unless they are endangered, threatened or otherwise at risk provincially or nationally, even if they are rare in the Park, if it will detract from the more important efforts to take an ecosystem approach and restore the appropriate vegetation communities in the Park. Exceptions to this would include temporary initiatives to maintain locally at risk populations while appropriate community or ecosystem-level management is being undertaken to restore appropriate habitat.

7.3 Plant Species At Risk - Secure at Mainland Point Pelee National Park

7.3.1 Objective

1. Maintain appropriate habitat for these species such that they remain secure in the Park as an integral part of the natural vegetation.

7.3.2 Species

These Species At Risk are currently known or believed to have stable populations at Point Pelee.

- Carolina Whitlow-grass (*Draba reptans*)
- Swamp Rose Mallow (*Hibiscus moscheutos* ssp. *moscheutos*)
- Appendaged Waterleaf (*Hydrophyllum appendiculatum*)
- American Water-willow (*Justicia americana*)
- Yellow Pond Lily (*Nuphar advena*)
- Common Hop-tree (*Ptelea trifoliata*)
- Trailing Wild Bean (*Strophostyles helvola*)

7.3.3 Management Actions

1. Assess and respond to any threats to these species. (H)
2. Evaluate the impacts, if any, of purple loosestrife on swamp rose mallow and respond accordingly. (H)
3. Address common hop-tree and Carolina whitlow-grass needs through the Eastern Prickly Pear Cactus-Lake Erie Sand Spit Savannas Recovery Strategy and Action Plan(s). (M)
4. Continue to evaluate any potential impacts to the habitat of these species that may result from management actions for specific vegetation types (per directions in section 4). (L)

7.3.4 Management Considerations

1. If these species are given due consideration in the development of Fire Management Plans, as noted in the vegetation management actions provided in section 4, potential conflicts with these Species At Risk should be avoided.
2. Impacts of purple loosestrife on swamp rose mallow.

7.4 Plant Species At Risk - Native To Ontario but not to Mainland Point Pelee National Park

This group consists of plant species considered to be introduced to the mainland areas of Point Pelee National Park.

7.4.1 Objective

1. Generally, allow these species to persist until they die of natural causes.

7.4.2 Species

- Kentucky coffee-tree (*Gymnocladus dioica*) is known to be native to Middle Island but not the mainland area of Point Pelee National Park (White and Oldham 2000).

- Wild hyacinth (*Camassia scilloides*) populations on the mainland portion of Point Pelee National Park are considered likely remnants of gardening around cottages and are not considered native (Oldham 1988).
- Hairy mountain mint (*Pycnanthemum verticillatum* var. *pilosum*).
- Honey locust (only those individuals that are planted).

7.4.3 Management Actions

1. Any honey locust that are known to be planted should be removed to prevent any contamination of the native gene pool. (H)

7.4.4 Management Considerations

1. Based on current knowledge, these species are not reproducing vigorously in the Park and are considered ecologically benign. They can be tolerated until they disappear naturally, but no special management should be undertaken to enhance their persistence in the Park.

7.5 Plant Species that May Never have Occurred at Mainland Point Pelee National Park

The following species may have historically occurred at Point Pelee or in the vicinity, however there is currently a lack of information to confirm them as ever having occurred in the Park.

7.5.1 Objective

1. Confirm, if possible, whether these species ever occurred in the Park and assign an appropriate status (*e.g.*, extirpated, threatened, mis-identified, *etc.*).

7.5.2 Species

- Small flower groovebur (*Agrimonia parviflora*)
- American Beach Grass (*Ammophila breviligulata*)
- Fogg's Goosefoot (*Chenopodium foggii*)
- Narrow-leaved Goosefoot (*Chenopodium leptophyllum*)
- June Grass (*Koeleria macrantha*)
- Rough Blazing-star (*Liatris aspera* var. *intermedia*)
- Taper-leaved Bugleweed (*Lycopus rubellus*)
- American ginseng (*Panax quinquefolius*)
- Eastern Prairie Fringed Orchid (*Platanthera leucophaea*)
- Common Greenbrier (*Smilax rotundifolia*)
- Branching Bur-reed (*Sparganium androcladum*)
- Wax-leaved Meadow Rue (*Thalictrum revolutum*)
- Marsh St. John's-wort (*Triadenum fraseri*)

7.5.3 Management Actions

1. Determine the origin of all species records for which insufficient information exists, to confirm presence or absence in the Park by:
 - tracing references in Park documentation, where they have been provided, back to source documentation;

- where sources have not been provided in Park documentation, consult with the report author(s), where possible, to determine the source of the record, if known; and
 - check NHIC, herbarium and museum documentation to determine if old records exist. (M)
2. Verify, where possible, the presence of the species and approximate location of the species within Park borders based on original documentation and the recollection of authors and botanists. (M)
 3. Verify, where possible, the identity of the species based on specimen records retained in herbariums, museums or other holdings. (M)
 4. Undertake a vigorous search for each species in the appropriate habitat and/or location of the original record(s). (M)

7.5.4 Management Considerations

1. If it is determined that any of these species historically occurred within Park boundaries, they should be treated as extirpated SAR and considered for re-introduction, if suitable habitat exists or can be restored, unless they are located during field searches.

7.6 Plant Species With Unknown Population Status National Park

The status of Species At Risk in this group at PPNP is currently unknown, either because the location in the Park is unknown, or its status with respect to numbers, threats, *etc.*, are not recorded. Without current population information for these species it is difficult to determine if there will be potential conflicts with the proposed management actions for vegetation provided in section 4.

7.6.1 Objective

1. Determine the current status (location and numbers) of these species in the Park.
2. Assign each species to the appropriate group to facilitate management.

7.6.2 Species

- False Indigo (*Amorpha fruticosa*)
- Toothed Rock-cress (*Arabis shortii*)
- Trumpet Creeper (*Campsis radicans*)
- Bellow-beaked Sedge (*Carex albicans* var. *albicans*)
- Narrowleaf Sedge (*Carex amphibola*)
- Fescue Sedge (*Carex brevior*)
- Crawe's Sedge (*Carex crawei*)
- Eastern Few-fruited Sedge (*Carex oligocarpa*)
- Long-hairy chickweed (*Cerastium arvense* ssp. *velutinum*)
- Standley Goosefoot (*Chenopodium standleyanum*)
- Schweinitz's Flatsedge (*Cyperus schweinitzii*)
- Hoary Tick-trefoil (*Desmodium canescens*)
- Walter's barnyard grass (*Echinocloa walteri*)
- False-daisy (*Eclipta prostrata*)

- Western Wild-rye (*Elymus smithii*)
- Slender Fimbry (*Fimbristylis autumnalis*)
- Rock-geranium (*Heuchera americana*)
- Wild Potato Vine (*Ipomoea pandurata*)
- Butternut (*Juglans cinera*)
- Sharp-fruit Rush (*Juncus acuminatus*)
- Virginia Bugleweed (*Lycopus virginicus*)
- Swamp Loosestrife (*Lysimachia terrestris*)
- Prairie Sundrops (*Oenothera pilosella* ssp. *pilosella*)
- Heller's Witchgrass (*Panicum oligosanthes*)
- Pink Milkwort (*Polygala incarnata*)
- Erect Knotweed (*Polygonum erectum*)
- Sessile-fruited arrowhead (*Sagittaria rigida*)
- Lizard's Tail (*Saururus cernuus*)
- Upright Carrion Flower (*Smilax ecirrata*)
- Great Plains Ladies' Tresses (*Spiranthes magnicamporum*)
- American Yew (*Taxus canadensis*)
- Tall Ironweed (*Vernonia gigantea*)

7.6.3 Management Actions

1. Determine and trace the origin of all species records for which insufficient information exists to ascertain status of each species in the Park by:
 - tracing references in Park documentation, where they have been provided, back to source documentation;
 - where sources have not been provided in Park documentation, consult with the report author(s), where possible, to determine the source of the record, if known; and
 - check NHIC, herbarium and museum documentation to determine if historical information exists regarding species location and/or status within the Park. (M)
2. Verify, where possible, the habitat and/or species associations and/or approximate location of the species within Park borders based on original documentation and the recollections of authors and botanists. (M)
3. Undertake a vigorous search for these species in the appropriate habitat and/or location of the original record(s), and collect information on location, population sizes, threats, etc. (M)

7.6.4 Management Considerations

1. None

8.0 PLANT SPECIES AT RISK OBJECTIVES - MIDDLE ISLAND

8.1 Plant Species At Risk - Extirpated from Middle Island

The following SAR have not been documented since the 1940s on Middle Island. Appropriate habitat for these species was searched in 2002 and 2003 without specimens being found (North-

South Environmental 2004b). Therefore, it is considered likely that they are extirpated from Middle Island.

8.1.1 Objective

1. Determine the desirability and feasibility of re-introducing these species.

8.1.2 Species

- Frank's Sedge (*Carex frankii*)
- American Water-willow (*Justicia americana*)
- Trailing Wild Bean (*Strophostyles helvola*)
- Upright Greenbriar (*Smilax ecirrata*)

8.1.3 Management Actions

1. The possibility of re-introducing these species to Middle Island should be investigated. This should be done along with investigations into re-introducing species on the mainland portion of the Park. (L)

8.1.4 Management Considerations

1. Need to consider the impacts of cormorants prior to re-introducing extirpated species.
2. Need to determine cause(s) of extirpation, and ensure that they no longer exist, or can be mitigated before attempting re-introduction. This will require some judgement to assess if causes are natural or human-related, either directly or indirectly. It may not be feasible or desirable to re-introduce species that have been extirpated owing to natural causes. Species should only be re-introduced if they can reasonably be expected to be self-sustaining without species-specific management.
3. A more detailed vegetation management plan, including visioning, is required for Middle Island and should be done before species restoration is undertaken.

8.2 Plant Species At Risk - Declining at Middle Island

These Species At Risk are currently known or believed to have declining populations on Middle Island.

8.2.1 Objective

1. Protect and preserve these species as an integral part of the natural vegetation of the Park.

8.2.2 Species

- Spring Avens (*Geum vernum*)
- Blue Ash (*Fraxinus quadrangulata*)
- Kentucky Coffee-tree (*Gymnocladus dioicus*)
- Red Mulberry (*Morus rubra*)

8.2.3 Management Actions

1. Evaluate the current status of each species in this category and implement temporary measures to secure any species that are in imminent danger of being extirpated from the Park. (H)
2. Determine cause(s) for the declines in these species. (H)
3. Implement the management actions associated with the VMOs in order to restore the habitat conditions (*e.g.*, vegetation communities) in which these species occur, thus providing sustainable conditions for their long-term persistence in the Park. (H)
4. Implement any species-specific management actions recommended in recovery strategies or action plans. (H)
5. Prioritize actions for securing declining species based on the urgency for action that will prevent species becoming extirpated from the Park (see management concern #2 below). (M)

8.2.4 Management Considerations

1. The increasing double-crested cormorant population on Middle Island is thought to be the primary cause for the decline in these species. Other possible causes (hybridization between white and red mulberry) should also be investigated.
2. Some SAR may be declining because hackberry forest is advancing into previously early successional areas.
3. It should be determined whether these species can be secured through management at the community level, *i.e.*, by restoring appropriate habitat conditions. Some species may require additional management intervention to stabilize their populations (*e.g.*, removal of white mulberry to prevent hybridization with the endangered red mulberry and subsequent loss of the red mulberry genes).
4. The limited resources for species-specific conservation need to be prioritized based on a number of factors that would include preventing species that are now secure from declining. This can largely be achieved through appropriate management at the community level. Generally, scarce resources should not be expended on species management unless they are endangered, threatened or otherwise at risk provincially or nationally, even if they are rare in the Park, if it will detract from the more important efforts to take an ecosystem approach and restore the appropriate vegetation communities in the Park. Exceptions to this would include temporary initiatives to maintain locally at risk populations while appropriate community or ecosystem-level management is being undertaken to restore appropriate habitat.

8.3 Plant Species At Risk - Secure on Middle Island

8.3.1 Objective

1. Maintain appropriate habitat for these species such that they remain secure in the Park as an integral part of the natural vegetation.

8.3.2 Species

These Species At Risk are currently known or believed to have stable populations on Middle Island, and appear to be secure in areas of the Island not impacted by cormorants. If cormorants expand their nesting habitat to include the entire Island all of these plant species will be at risk.

- Scorpion Grass (*Myosotis macrosperma*)
- Wild Hyacinth (*Camassia scilloides*)
- Clustered Sedge (*Carex aggregata*)
- Davis' Sedge (*Carex davisii*)
- Nebraska Sedge (*Carex jamesii*)
- Creeping Chervil (*Chaerophyllum procumbens* var. *procumbens*)
- Yellow Corydalis (*Corydalis flavula*)
- Woodland Lettuce (*Lactuca floridana*)
- Appendaged Waterleaf (*Hydrophyllum appendiculatum*)
- Common Hop-tree (*Ptelea trifoliata*)
- Miami Mist (*Phacelia purshii*)

8.3.3 Management Actions

1. Continue to evaluate any potential impacts to the habitat of these species that may result from management actions, provided in section 5.0. (H)
2. Assess and respond to any threats to these species. (M)

8.3.4 Management Considerations

1. Impacts from double-crested cormorants.
2. Impacts from succession.
3. Synergistic impacts of cormorants and succession, as previously early successional areas such as airstrips, which are currently experiencing low cormorant impacts, will eventually have trees large enough to support cormorant nests.

8.4 Plant Species With Unknown Population Status on Middle Island

The following species have been documented as occurring at Middle Island as recently as the 1980s. Investigations into the current population status of SAR on Middle Island in 2002 and 2003 (North-South Environmental 2004b) did not relocate these species on the Island, however the seed banks for these species could still exist.

8.4.1 Objective

1. Confirm current status of these species in the Park.
2. Assign these species to a group to facilitate management

8.4.2 Species

- Toothed Rock-cress (*Arabis shortii*)
- Standley Goosefoot (*Chenopodium standleyanum*)
- Harbinger-of-spring (*Erigenia bulbosa*)

- Burning Bush (*Euonymus atropurpurea* var. *atropurpurea*)
- Honey Locust (*Gleditsia triacanthos*)
- Rock-geranium (*Heuchera americana*)

8.4.3 Management Actions

1. Consideration should be given to re-assigning these species as extirpated from Middle Island based on the failure to find them during 2002/3 surveys, at which point investigations into the desirability and feasibility of re-introducing them can be initiated. (M)

8.4.4 Management Considerations

1. The threats that led to extirpation must be examined prior to re-introduction, most importantly cormorant impacts, but also succession.

9.0 IMPLEMENTATION RECOMMENDATIONS

9.1 Limitations to Achieving Objectives

1. Successful programs and initiatives for managing the Park's flora and vegetation need to be evaluated in the context of the Park history.
The goals and objectives are written to assist Parks Canada in increasing the ecological integrity of Point Pelee National Park. However, the long history of disturbance has to be borne in mind, especially when the next review occurs and the degree to which objectives are achieved is evaluated. The past history of the Park places some practical limits on restoration, and although this should not be an excuse for lack of progress, it should be not ignored.
2. The inability to control some factors - e.g., water levels, climate change, influx of exotics from Lake Erie, legacy of historical actions (e.g., DDT) needs to be recognized as a limitation on the management of the Park.
As with #1, this does not mean that these factors should be ignored, they need to be documented along with other management concerns, and incorporated into the resource management decision making process.
3. Current vegetation classification and community mapping needs to be undertaken.
The lack of current and accurate vegetation mapping for the Park is a hindrance to management in that the current state of succession and distribution of community types is not documented (see 9.2, #5 for discussion).
4. Updating the status of SAR in the park should be a priority.
The lack of knowledge of the status (location and abundance) of many Species At Risk in the Park severely limits the ability to adequately provide for their protection and initiate appropriate management.

9.2 Other Recommendations

In addition to the lists of Management Actions provided under each vegetation type, all of which constitute recommendations to be implemented, there are several other related tasks that should be pursued, as noted below.

1. A Vegetation Management Plan needs to be developed to guide the overall management of vegetation in the Park and coordinate the various components of vegetation management. It should include fairly detailed prescriptions for management of the various vegetation types, based on the goals and objectives, once they have been approved. To facilitate this, it may be beneficial to undertake the Vegetation Management Plan in sections, so that urgent actions can be incorporated into plans without waiting for the whole Park to be examined. Thus the existing *Red Cedar Savannah Restoration Plan* (North-South Environmental 1994) could form the basis for the Management Plan for the Sand Barren (Red Cedar Savannah) vegetation type. Likewise, the *Exotic Plant Management Plan* (Dunster 1990a) can be simply referred to in the Vegetation Management Plan. Thus several major components already exist, but they need to be pulled together in one cohesive document.

The Fire Management Plan that has been referred to in several Management Actions sections of this report should be referred to in the Vegetation Management Plan, but should be a stand-alone document. The two reports can be undertaken simultaneously, as both will be based on the VMOs.

Some SAR may require species-specific management. The actions required may be outlined in research reports (*e.g.*, red mulberry pathology), in single species Park Management Plans (*e.g.*, eastern prickly pear cactus) or may be defined in national Recovery Strategies and Action Plans either at the single species, multi-species or ecosystem level.

2. It is our observation that there is insufficient staff to undertake the extent of management required to achieve the VMOs presented in this report. There must be a greater commitment to secure additional staff that will be less burdened with administrative duties and can devote the majority of their time to implementing management in the field.
3. The cultural and natural heritage components of the Park should be more integrated. The Park's history is inexorably tied to human land management activities. These go back beyond the first settlement by Europeans. If the restoration and management of the Park is based on a Vision that largely reflects the pre-settlement condition (and that should be the starting point for determining the Park's vegetation), then there is much to be gained by putting management in the context of aboriginal use. Interpretive activities can draw on this and interpretation of the Park's natural features could incorporate messages to visitors that explain the basis for active management in the Park. A new component to the interpretation of the Park should be developed that ties the cultural message (both pre-settlement and early settlement) more closely to the underlying reasons for restoration of natural features of the Park. This would convey the important role the First Nations had

in managing the Point over thousands of years (*e.g.*, through burning), and that this condition constitutes the pre-settlement landscape that is regarded as “the natural condition” of the Park, prior to disturbance following settlement.

4. Consistent with #3 above, the Park should continue to incorporate restoration/active management issues and ecosystem-based management into public education programs.
5. As noted in section 10.1, there is an urgent need for updated vegetation mapping. The approach used to undertake this should be carefully considered. Although there may be a temptation to automatically use the provincial Ecological Land Use Classification (ELC) system, Park staff need to evaluate whether this will provide the level of mapping needed for in-park management. The provincial ELC is based on a province-wide database of vegetation types, and although there were sampling plots located in the Park, the level of detail may not reflect the in-park vegetation diversity, and thus any resulting map may be too general to be of use for management in the Park. There should also be consideration of the current nation-wide initiative in Parks Canada to classify vegetation in Parks using international standards (D. McLennan pers. comm. 2004).

As part of this initiative, it would be beneficial to track down the mapping completed by Dr. Maycock in the 1970s. This may now reside with Dr. Terry Carlton at the University of Toronto, who we understand may have custody of Dr. Maycock’s data. This historical vegetation map will be useful for further analysis of successional trends in the Park.

9.3 Monitoring Vegetation Management Objectives

Monitoring the VMOs should be undertaken within an adaptive management framework. Adaptive management is an approach that recognizes and facilitates the on-going refinement of programs and management prescriptions in response to improved knowledge. Resource planning leads to management (actions) that subsequently need to be monitored. Monitoring data are then evaluated and the new knowledge is used to confirm or refine plans. To apply an adaptive management approach, more than simple data collection is needed. There are several steps required to implement an adaptive management approach including: developing goals and objectives, data collection, data management, data analysis, evaluation of goals and objectives and program refinement, and reporting. Thus in the context of this report, goals and objectives for vegetation management need to be periodically monitored to assess the degree to which they have been fulfilled, and to evaluate if they need to be modified.

The monitoring needs to be undertaken on several levels. First, all of the recommendations that result in management actions should have a monitoring component that addresses how they will be assessed. For example, if a Fire Management Plan is developed, it should include specific protocols for monitoring the response to fire management. This would include: collecting baseline data, monitoring after fires, and assessing the results of the initiative, *etc.* Second, the VMOs themselves have to be evaluated. At a minimum, relevant Park staff should meet annually to review each of the objectives to determine the extent to which they have been met. This should include documentation on the progress of implementing the management actions

provided for each objective. Management actions could be evaluated by documenting, how close they are to implementation using criteria such as:

- action approved for implementation;
- action allocated in a budget;
- budget approved;
- action implemented;
- action completed;
- monitoring of the success of the management action implemented.

Where possible, progress in achieving VMOs should be quantified. This will require updated mapping of vegetation units in the Park. As initiatives to restore vegetation are undertaken, the area of each vegetation unit can be monitored and compared to the Vision Map. This will require comparison of each vegetation unit with the expected coverage as portrayed in the Vision Map. This should be qualified, as the Vision is only a rough approximation of the coverages of the various plants, and should not be taken literally.

A summary of this annual monitoring of VMOs should be included in the periodic reviews of the Park Management Plan, as well as any future State of the Park reports. Much the same process is required for monitoring progress on SAR.

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APPENDIX 1. 2003 WORKSHOP PARTICIPANT LIST

POINT PELEE NATIONAL PARK
Vegetation Management Objectives Workshop
March 27 & 28, 2003

PARTICIPANTS LIST

Ambrose, John	Consultant
Arthur, Kathryn	Essex Region Conservation Authority
Bakowsky, Wasyl	Natural Heritage Information Centre
Bazely, Dawn	York University
Blazeski, Valerie	Parks Canada
Dama, Tony	Point Pelee Advisory Committee Observer
Dobbie, Tammy	Parks Canada
Etwell, Tracey	York University
Forrester, Mr.	Consultant
Harvey, Geordon	Parks Canada
Johnson, Mary Ann	North-South Environmental Inc.
Linke, Tom	Parks Canada
Mainguy, Sarah	North-South Environmental Inc.
M ^c Kay, Vicki	Parks Canada
Mouland, Gary	Parks Canada
Mouneimne, Sarah	Parks Canada
Reive, Dan	Parks Canada
Reznicek, Tony	University of Michigan
Rider, Alf	Friends of Point Pelee
Rosenthal, Julie	Ontario Parks
Rupert, Sarah	Parks Canada
Rush, Scott	York University
Scott, Kelly	Parks Canada
Sharp, Mirek	North-South Environmental Inc.
Stephenson, Bill	Parks Canada
Stranak, Marian	Parks Canada
Waldron, Gerry	Consultant
Wilhelm, Gerry	Conservation Design Forum

APPENDIX 2. 2003 WORKSHOP NOTES

POINT PELEE NATIONAL PARK
Vegetation Management Objectives Workshop
March 27 & 28, 2003

WORKSHOP NOTES

The following is a summary of the discussions between participants at the workshop held at Point Pelee National Park, March 27-28, 2003. Ideas are organized by participant within broad categories used in the workshop.

Bill Stephenson:

- take quote about 1000s of deer with a grain of salt
- 2.7-3.1 deer/km² pre-settlement
- extirpated by 1950s
- target now of 6.0/km²

Dawn Bazely:

- every year recent literature downgrades estimates of deer
- probably 1 deer/km² for extensive forest

Wasył Bakowsky:

- black maple is associated with limestone in Niagara (not necessarily floodplains)

John Ambrose:

- the proliferation of pokeweed is associated with cormorants (re Middle Island)

Identified and discussed by group collectively:

- invasive exotics
- planting carolinian species that are not native to the Park
- clear land and plant or leave alone?
- appropriate management of disturbances
- how to measure drivers of change - introduce appropriate disturbances or remove inappropriate disturbances (active versus passive management)
- summarize current management and determine problems to guide management (sign posts)
- different people = different outcomes
- what does Park have to achieve?
- is Park designated for the right reason?

John Ambrose:

- invasive exotics
- questionable planting of Carolinian species
- geomorphological integrity - restoring drainage patterns and microhabitat

Alf Rider:

- clear land and plant trees or clear land and let it grow?
- DDT management - he has never seen any undertaken

Dawn Bazely:

- what approach should be taken to manage disturbance?
- non-native species declining with management
- Park has done a good job of managing - do nothing
- ecological integrity report is important
- disconnect between pure conservation biologists and plant people planning restoration efforts
- general public may not understand
- should we adopt a restoration management philosophy/approach formally?

Tony Reznicek:

- what is happening now?
- what is wrong (what is making people unhappy) about what is happening now?
- should look for “signposts”

Tammy Dobbie:

- not seeing preferred outcome for different people
- related to what Park is trying to achieve
- Park is designated for specific purpose - do we re-examine designation?
- there is a difference between the Park mandate and what is wrong
- regional perspective, what can we accomplish as part of a larger partnership

Bill Stephenson:

- change in Park mandate from St. Lawrence lowland to sand spit (Carolinian) in Lake Erie abandoned agricultural land was huge issue in past - maybe over - reached to that and now ignoring some of the successional issues

Vicki M^cKay:

- should we restore extirpated species?
- cormorants (Middle Island) and emerald ash borer are new issues that must be dealt with

Marion Stranak:

- what change can we realistically facilitate outside Park?
- managing for species or habitats and processes?

Julie Rosenthal(Ontario Parks):

- partnerships (East Sister Island has similar cormorant issues)

Identified and discussed by group collectively:

- non-Park perturbations versus Park perturbations

- conservation versus restoration - should the Park adopt an ecological restoration statement?
- retention and re-introduction of species - should the Park manage for species or habitats and ecosystem functions?
- regional role of Park
- realities and restrictions (partnerships)

Discussion on Park Mandate and Ecological Integrity

Marion Stranak:

- ecological integrity statement and vision
- protect, maintain, actively restore
- ecological integrity primacy
- big issue - being all things to all people
- birding experience and conservation of rare plants
- have to work with visitors and managers to change their view

Tom Linke:

- sand spit in Lake Erie also has cultural significance (DeLaurier)
- southern flying squirrels have been re-introduced, if we manage toward open habitat, what will happen to them?
- Park can not be all things to all people - species at northern edge of range, very small
- Park should not act as a museum

Vicki M^cKay:

- SAR Act will dominate - require maintenance of critical habitat
- no definitive answer to conflicts at present

Bill Stephenson:

- National Parks Act will trump SAR Act every time
- mandate of Park - guidance provided by ecological indicators of stress and function
- supposed to have standards and targets, difficult without adequate understanding
- likes to see trends rather than concrete objective
- need to be sure have indicators to targets and goals
- bad to lock into policy - need to review policy as well as goals

Dawn Bazely:

- tamarisk - highly invasive, however willow flycatcher nests in tamarisk
- does research feed back into statement and vision?

Alf Rider:

- scientific advisory committee to advise in light of potential SAR conflicts

Tony Reznicek:

- conflict not just due to human alteration

- always changing and dynamic - if you catch something on the way out, even if natural, generate conflict
- becomes a need for case-by-case determination
- important to remember that not all species will always be here

Mirek Sharp:

- micromanagement for small habitats while managing for ecological integrity

John Ambrose:

- not necessarily micromanagement - ecosystem level
- shrubs could be replaced with native species that does the same thing

Identified and discussed by group collectively:

- cannot and should not exclude human activity
- SAR Act will require that critical habitat for each species be mapped
- what role does regional protection play in SAR Act?
- maybe nothing is wrong with the mandate (no disagreements)
- policy and policy direction are flexible enough to deal with changes

Discussion on Management and Disturbances

Tom Linke:

- excessive succession in open fields not being managed

Alf Rider:

- fire being suppressed too much

Mirek Sharp:

- should we aim for a mosaic of native and earlier succession?

Gary Moulard:

- tried to manage perturbations and actively restore
- tried to remove impacts of cottages
- tried to manage non-natives , invested in cottage removal

Vicki M^cKay:

- sand budget has been altered

Dawn Bazely:

- earliest successional stages disappearing because sand not accruing
- vegetation grows very quickly without sand deposition and with too much stabilization will cease to happen
- invasive exotics not being removed
- talk about linkage along Lake Erie shoreline (are land donations ever made?)

Tony Reznicek:

- why do we care about successional processes being eliminated?
- PPNP has unique characteristics - people go to PPNP to see successional habitats (juniper savannah, eastern prickly pear cactus) and Lake Erie Dunes (not many around) not Carolinian forest
- if all becomes deciduous forest will lose rationale for PPNP existence, no longer an ecological treasure
- need to define what PPNP can contribute to the heritage of Canada
- ecological uniqueness has to be clearly defined, not only SARs, not in favour of managing for significant species because other unique attributes (e.g., under pines used to be *Taxus canadensis* up to 1960s - none left was a remarkable occurrence - bellweather for climate change)
- ecological value and interest of what's in Park, biogeographic interest
- PPNP was always this size, but now only habitat is in the Park
- will have to select priorities, cannot have every community in Essex
- decide what PPNP can do best to contribute to natural heritage of Canada

Bill Stephenson:

- many people come to Park for specifics - birds, plants, etc.
- if micromanagement would not end up with right mix for everybody
- Park is too small, there has been a large increase in Park level extirpations
- problem is a metapopulation issue
- replacability issue - find and establish and protect other populations
- if Park is too small, problems increase with further subdivision and development of land
- need to work with Leamington to plan long-term so Park will not continue to be fragmented
- need to be involved in basic exercises like OMB hearings, municipal planning
- do not have consistency of staff and funding - underlying problem

John Ambrose:

- need to work with partners in region, Ontario Parks and Friends Organization

Mirek Sharp:

- need to extend implementation objectives beyond Park

Marion Stranak:

- budget is too constrained to get too much involved outside the Park
- Canada South Land Trust - mechanism for land donations

Identified and discussed by group collectively:

- adaptive management requires policy management - currently crisis management
- "PPNP cannot be all things to all species"
- will require selecting priorities and working in the long-term through partnerships

Discussion on What Is Unique

Point Pelee

- original topography (ridge and trough)
- linkage to Hillman Marsh
- red cedar savannah / sand barren (dry sites not closing in like more mesic parts)
- sparrow field - grassland with red cedar savannah
- chat habitat restored - early successional thicket
- restore sand budget (imported sand may be only option)
- forested habitats - restore open canopy forest (black oak savannah)
- open shoreline ⇒ common juniper/dogwood ⇒ fragrant sumac/hop-tree ⇒ open oak savannah ⇒ closed canopy hackberry/walnut/maple/raspberry (species representative of active dune development)

Middle Island

- rock beach
- mature forest (black maple, blue ash, chinquapin oak, common hop-tree, hackberry)
- marsh

Bill Stephenson:

- black locust taken out before deer
- seed bank recovery as a natural mechanism
- need to mention marsh vegetation - allow openings, clean out organics, depositing sand, removing carp
- probably marsh was historically wetter with more breaches
- creeks entered at north end of marsh - now cut off by dyke

Mirek Sharp:

- what do we mean by marsh?
- dominant cattail species has changed
- should cultural field be reflected?

Alf Rider:

- burning? restore habitat for sandhill crane and king rail
- molluscs in ponds?
- periodic storm events may eliminate trees on Middle Island
- do we maintain marsh on Middle Island (man-made)?
- cormorants will also kill trees

Marion Stranak:

- species have been lost from the marsh - possibly due to DDT contamination
- was the marsh part of a much larger complex? nobody knows
- cultural field should be reflected in the Park
- what should be at Middle Island?

Dan Reive:

- 1988 last significant fire in marsh

John Ambrose:

- there are terrestrial molluscs only at PPNP
- Middle Island - blue ash, chinquapin oak
- should retain marsh on Middle Island (at least do not fill in and eliminate)

Vicki M^cKay:

- *Typha x glauca* much more dense - has changed species composition of marsh
- alterations of fish communities in Great Lakes also affects cormorant population
- fewer top fish predators

Wasył Bakowsky:

- restore hydrology as well as sand budget
- Middle Island should be composed of black maple on limestone

Tom Linke:

- old fields are stalled ecosystem - thick mat of Eurasian grasses
- if going to restore old fields have to do more than leave them

Dawn Bazely:

- Agropyrons are allelopathic

Tony Reznicek:

- Middle Island - hackberry on limestone and calcareous sand not that strikingly unusual - not “wrong”

Sarah Rupert:

- cormorant numbers higher than they ever were in Great Lakes
- bald eagles used to dissipate cormorants from nesting colonies
- on US side are controlling cormorants

Julie Rosenthal:

- egg oiling usual method but not useful here because no ground nesting colonies

Identified and discussed by group collectively:

- public perception and education extremely important
- will require prescribed burn plan for the Park
- important to consider both scale and patchiness of ecosystems in the Park as well as time
- Park ecosystems are dynamic

Discussion on Ridge and Trough Topography

John Ambrose:

- need to adjust spending on restoration depending on other issues
- red cedar savannah should be on higher ridges

Tony Reznicek:

- Great Lakes fluctuating water levels - ridge and trough topography is very important especially if water levels stay high
- it is conceivable that if the topography could be restored, that would work toward much more diverse processes, and an equilibrium could be reached between water levels that are too high or too low
- patchiness on a landscape scale versus Point Pelee scale
- Ann Arbour Parks Department has instituted annual burns in city parks, sometimes on a very small scale

Mirek Sharp:

- ridge and trough topography provides moisture gradient
- as result get plants of both inundation and drought
- very good ecological reason for restoring ridge and trough topography
- model is extant in swamp, emulate that? (general agreement)
- how large should cultural fields be? maintenance of cultural fields may be inconsistent with ecological integrity
- central spine may be highest and driest ridge - sand prairie habitat
- that area is where sand prairie should be restored
- although remnants of savannah/prairie exist, there is not enough - need seed propagation, not just burning
- MNR have prescribed burn expertise

Wasył Bakowsky:

- MNR conducted 15-20 prescribed burns in 2002, peak was 33

Bill Stephenson:

- open field does not mean Eurasian grasses
- may be able to do the same with native grasses
- not talking about large topography changes with ridge and trough (18" maximum)
- distance between troughs narrow toward tip
- stages of burning = stages of succession
- may need to burn some areas before others because of competing interests
- has to be carefully planned

Gerry Wilhelm:

- ridge and trough should go where it was originally located
- plant communities do not come back with restoration if they do not belong there
- Eurasian weeds make restoration a different ball game

- cannot sustain what you want without soil organic carbon, microrhizal elements, pollinators, beetles, etc.
- need to define forest in terms of more than black oak
- cannot restore something that does not belong, need to understand specific site
- in most timbered landscapes, light levels drop to 50 foot candles which is not enough horsepower to drive root mass
- if an area is burned, surprisingly rich diversity results
- repeated burning (25 years of annual fire) is needed to discover what communities are really there
- remove some downed woody debris and burn it 5 years running, let the land guide
- find out what is in seed bank
- get sense of which areas are best
- 100% of native burns set in autumn annually
- Walpole Island burned annually in fall (occasionally in spring) “edenesque landscape”
- firing ranges in North Carolina and Wisconsin burned frequently and very floristically diverse, weeds much reduced
- restoration of sand should have regard for particle size
- after repeated burns native species become more robust and outcompete weeds
- with annual burns get “scudding fire” and micro patches because there is not as much fuel
- fire is above ground - “parboil” organisms if allow fuel to get too wet
- annual fires allow insect fauna to persist - cooler micropatches are left even though at a larger scale larger patches are burned
- fire should be used wherever there is appropriate fuel, wherever more carbon is above ground
- operational phases - later stages may not matter if burned initially may need fire

Sarah Rupert:

- cultural meadow = areas that were once agricultural land being allowed to regenerate
- near DeLaurier trail bounded by parking lot and trail
- significant species associated with early successional fields

Dawn Bazely:

- central spine was where restoration was tried
- some work better than others because of grey dogwood
- seed bank was more diverse with native species in the Visitor Centre
- DeLaurier has many more weedy species
- found that with occasional burning weedy species begin to dominate some areas
- burns do not go into wet forest - within a burn block there are areas that remain unburned
- cedars will not burn without a very “hot” burn

Alf Rider:

- deer can change species diversity
- might have too hot a burn if did not remove excess fuel

Gary Mouland:

- surprises after burning not always welcome

Discussion on DDT

Mirek Sharp:

- DDT bound up in soils - relatively inert?
- if ridge and trough topography is restored will DDT be mobilized?

Vicki M^cKay:

- DDT in specific areas - may have to stay away from certain areas
- Shuster's Trail cuts off hydrology - if removed or elevated, hydrology and topography could be restored

Gary Mouland:

- DDT issues at Camp Henry, Sleepy Hollow, and behind maintenance compound
- used over a wide area of agricultural land

Marion Stranak:

- action will be affected by DDT - not a show stopper but a big factor
- cannot remove and ship elsewhere (cost) - only one place in Alberta accepting soil

Bill Stephenson:

- human health is main problem
- could restore ridge and trough topography through contaminated areas but would have to keep people out

Tom Linke:

- very patchy distribution - highest behind maintenance compound

Tammy Dobbie:

- even sampling for DDT was very expensive

Discussion on Continuum From Open Water to Closed Forest

Mirek Sharp:

- restoration of open shoreline on west beach is accepted
- what do we do with areas of beach with grape vine, etc.?
- what about garlic mustard and common hackberry where not wanted?
- open up canopy or increase fire?

Tony Reznicek:

- used to be a lot of invasion by sweet clover - has that diminished?

- what are options for restoring sand budgets?
- do we know what the deficit is?
- Michigan dune systems are still nearly intact
- 30 km stretches of sand dunes - but not similar vegetation - more boreal (jack pine)
- nothing similar in Michigan to Pelee - no Erie or Huron dunes - very unusual
- *Prunus pumila* was almost gone in 1970s
- *Vulpia octiflora* probably still present, *Asclepias viridiflora* should continue to persist
- garlic mustard is an issue but is very difficult to deal with
- at PPNP do not have many sensitive woodland species, therefore garlic mustard does not have same impact as in woodlands with small, conservative species

Dawn Bazely:

- non-natives present in plots but not dominant, they are declining in seed bank, not interfering with biodiversity, etc.
- east beach more of a problem with primary succession advancing very quickly
- how significant are the dune systems at Pelee?
- very dynamic and hard to manage - could have storms that open out again
- 8 year study on garlic mustard
- at Pelee garlic mustard is dynamic, no change in species richness
- in Rondeau, in plots with garlic mustard species richness have doubled
- garlic mustard not preventing species from coming back from deer browse
- garlic mustard spreads into new areas at same rate as jack-in-the-pulpit
- some evidence that species richness is higher in places with long-term garlic mustard than in areas where garlic mustard is recent
- very few exotic plants really threaten biodiversity - garlic mustard is not as much a problem as people think
- density of garlic mustard is declining in Park - probably a visibility issue
- as soon as deer taken out in Rondeau garlic mustard declined - need to focus on right species
- mesic restoration plots lose non-natives when canopy closes
- *Hedera* (English ivy) is a blanket smotherer

John Ambrose:

- Norway maple is a worry along forest edge
- when water levels are high there is more vegetation present, while in drought years less vegetation is visible
- therefore the vegetation is primarily composed of long lived perennials that come back when conditions right
- one extirpation from beach community (*Prunus pumila*)
- forest is not advancing all of the time, it may appear as if it moves more than reality
- do not need to actively manage grapevine on beaches, observe
- *Euonymus fortuneii* fruits when it reaches adult form climbs trees and then are easily dispersed by birds

Tammy Dobbie:

- concerns about eastern prickly pear cactus not reproducing in new areas on west beach
- new open areas are not being created

Wasył Bakowsky:

- seeds and propagules not moving in westerly direction - not recolonizing openings on west beach

Tom Linke:

- hydro maintenance used to keep lower third of west beach open
- maintained habitat for eastern prickly pear cactus
- now hydro line gone and no longer maintained open - shrubs growing in

Vicki M^cKay:

- sand budget has changed so habitat not being maintained naturally as in the past
- white mulberry is a problem with SAR - only 20 pure red mulberries left, white mulberry should be eliminated

Bill Stephenson:

- removed sand traps north of Park
- dumping or extracting sand are extremely expensive solutions
- nobody knows what sand budget was before - solution is bigger than the Park
- Parks Canada says that Point Pelee sand spit (not the vegetation) is significant

Gerry Wilhelm:

- agrees that PPNP is unique to world - in addition pannes are each unique
- tend to think of European plants as a problem, however these may be the only thing that produces soil organic carbon in some woodlands
- has seen situations where buckthorn has been removed and honeysuckle and garlic mustard have moved in, then *maianthemum racemosum* and *geranium maculatum* moved in
- after 5 years garlic mustard was no longer an issue
- however, buckthorn, *phragmites*, *centaurea maculata* - considered “cancerous”

Sarah Rupert:

- facilities located on west side some in places where sand dunes want to form
- could be removing some of those

Gerry Waldron:

- there are very scary exotics in the park - *Vinca*, *Hedera*, *Euonymus*, *Norway maple*, *Mahonia*

Discussion on Swamp Forest

Tom Linke:

- water levels are a problem because of serious droughts - silver maple starting to move into troughs

Vicki M^cKay:

- 10 years ago, VMO Workshop participants were worried swamp forest would be drowned out - point is great lakes fluctuate

Sarah Rupert:

- eastern barrier - storms have removed trees
- community has opened up in swamp forest from what it used to be
- goes back to sand budget - east beach is not what it used to be

Bill Stephenson:

- elm and chestnut have declined - were probably providing protection

Mirek Sharp:

should we restore elm?

Tony Reznicek:

- could restore elm to the Park but would only get to about 10" diameter and then beetle would attack
- need to plan ahead for when 98% of the ash is gone

John Ambrose:

- elm would be a good tree to plant because it grows fast

Gerry Wilhelm:

- can have alternating sedge meadow and black oak because of micro-dewatering
- shade and water limiting factors
- let fire limit tree growth even in swamp forest
- impact of woody phneatrophytes not trivial

Discussion on Marsh

Mirek Sharp:

- what about fire?
- any concerns about peat fires?

John Ambrose:

- carp may be stirring up nutrients
- do we know how many carp in marsh?

- vegetation comes back after carp excluded (i.e. Cootes Paradise)

Gerry Wilhelm:

- need to fix hydrological problem
- fire allows diversity to re-establish itself
- peat fires would probably be a concern

Sarah Rupert:

- spring following burn - animal diversity positive effect of burning marsh
- frog's-bit and *phragmites* are the next really serious invaders
- Stony Point marsh seriously affected because habitat changes association with *phragmites*

Tammy Dobbie:

- Lake Pond is 5 feet deep - ponds do not freeze to the bottom
- there was a carp die off recently in Sanctuary Pond, but Lake Pond was not affected

Sarah Mainguy:

- cannot get rid of carp really

Tom Linke:

- *phragmites* started to invade marsh - washed away

APPENDIX 3. 2003 WORKSHOP VISION

A Vision for the Vegetation of Point Pelee National Park

The following are the comments provided by participants at the workshop held at Point Pelee National Park, March 27-28, 2003, on the content of a Vision for the Park vegetation.

1. Recognize that the Park is a dynamic, changing, environment where natural disturbance is respected, and actively maintained.
2. The Park should be an environment where you minimize interference, e.g., if a building is removed leave the site alone to regenerate.
3. Should always use plants native to the Park, even those that used to occur (have been extirpated).
4. Use only plants of local provenance.
5. Need to go beyond Park boundaries for plant sources, but only those sources from where it could potentially be introduced naturally (may be difficult to find arbitrary boundaries, consider each on a case-by-case basis)
6. Reduce the number and frequency of non-native plants.
7. Vegetation should retain whatever ecological integrity it has: restore and promote biodiversity, increase representation, restore ecosystem processes, reducing man-made stressors where possible.
8. Restore and maintain, enhance composition, structure and function.
9. Marsh vision: marsh will be managed to maintain optimum centre to edge ratio and optimum interspersion, aim toward a better sand budget, accept breaching as a natural successional process.
10. Parks Canada should implement, embrace, operationalize, be held accountable for management plan in a sustainable manner over time.
11. Accept fire as a primary management tool for restoring successional process in the Park.
12. Adopt adaptive management as a guide: continue to evaluate whether management is working.
13. Parks Canada should have a commitment to continuing management.
14. Want to end up with examples of pre-settlement vegetation.
15. Have to develop regional strategy to deal with double-crested cormorant .
16. Work with the municipality/private landowners to restore more natural sand deposition and erosion processes.
17. Stop the degradation of the tip (dead trees, sand erosion).
18. Five ecological processes that interact at Point Pelee: fire, wind, water, sand, light.
19. Establish partnerships with regional to international bodies, community stewardship and others based on a vision of a Greater Park Ecosystem that embraces 30% (EC) (ERCA 12.5%) natural cover in the Region.
20. Maintain flexibility in determining VMOs, within a broad definition of red cedar savannah/sand barren, strong native graminoid component under cedar.
21. Maintain a functional gradient/mosaic determined by dynamic nature of sand substrate from shore to interior.
22. Try to restore topography of the Park to promote microclimate.
23. Connection between aboriginal practices and VMOs should be made clear.
24. Research should make clear justifications for vegetation management (light levels, fine fuel, etc.).

APPENDIX 4. MANAGEMENT ACTIONS & PRIORITIES FOR IMPLEMENTATION

The following table summarizes the management actions and the park-wide management objectives from the preceding sections, along with the priorities for implementation. Priorities were established with input from Park staff.

Management Actions	Priority
PARK-WIDE MANAGEMENT OBJECTIVES	
Control exotic plant species in the Park.	High
Minimize impacts from deer browsing.	High
Use only indigenous species for restoration projects in the Park.	High
Minimize impacts from trail maintenance.	Medium
Eliminate impacts from pruning.	Medium
VEGETATION MANAGEMENT - POINT PELEE NATIONAL PARK	
Beach	
Develop partnerships with agencies and institutions that have input into shoreline planning and management, with the intent of ensuring that the Park's position on shoreline restoration is promoted.	High
Assemble a presentation for use when meeting with local agencies and institutions that summarizes the importance of natural shoreline processes at Point Pelee, and illustrates the extent of the problem associated with the imbalance of erosion and deposition.	High
Arrange meetings with local planning authorities and institutions to raise awareness of the shoreline problem and the need for inter-agency cooperation to resolve it.	High
Undertake an analysis of the feasibility of supplementing the sand budget, including quantification of the sand loss, with the aim of increasing the deposition rates and volumes on the beaches.	High
Assess the impact of existing facilities on the natural dune complex along the west beach and implement recovery actions where appropriate.	High
Continue to implement the Exotic Species Management Plan focusing on purple loosestrife along the beaches.	High
Undertake a shoreline study to evaluate the appropriateness of removing the remnant beach structures on the west tip (concrete rip-rap and limestone blocks), including predictions on the shoreline processes of such removal.	Medium
Assess the relative importance of visitor disturbance along the beach/vegetation interface near the tip with respect to erosional processes, and implement visitor management strategies where appropriate.	Medium
Develop a program to encourage natural stabilization, and consult with Pinery Provincial Park to review their highly successful dune stabilization program.	Medium
Document the occurrences of east barrier beach breaches through the review of historical documentation and photographs and maintaining a future record of breaches.	Medium
Sand Barrens/Shrub Thicket Sand Dunes	
Include the sand barren/shrub thicket in the Fire Management Plan (FMP) recommended for the savannah/woodland community, and allow prescribed burns in the savannah to extend into the sand barren.	High
Assess the impact of existing facilities on the natural dune complex along the west beach and implement recovery actions where appropriate.	High
Restore woody debris to depleted areas of vegetated back beach areas to serve as microhabitat for the five-lined skink.	High
Develop a program to encourage natural stabilization, and consult with Pinery Provincial Park to review their highly successful dune stabilization program.	Medium
Savannah and Woodland	
Develop the Fire Management Plan in a timely manner to avoid further loss of SAR and other elements of biodiversity through canopy closure.	High

Management Actions	Priority
Identify remnant savannah and woodlands with the highest Mean Coefficient of Conservatism (mean C) as a means of prioritizing sites for restoration.	High
Develop an interpretive message that emphasizes the link between the ecology and vegetation of the Park with the historic land management protection of First Nations.	High
Develop a strategy for restoring cottage sites, building on the existing <i>Site Restoration Management Manual</i> and consistent with ongoing research.	Low
Interior Sand Barren (Red Cedar Savannah)	
Use recommendations made in previous studies to move forward on restoration of this vegetation type in the Park	High
Develop the Fire Management Plan in a timely manner to avoid further loss of SAR and other elements of biodiversity through canopy closure.	High
Assess the feasibility of restoring the topography of the area proposed for sand barren.	Medium
Continue to collect information and where appropriate undertake studies on how to address the DDT “hotspots” and potential effects on human health.	Medium
Evaluate the area north of DeLaurier to the marsh boardwalk for its suitability for restoration to sand barren.	Low
Swamp Forest	
Develop a Restoration Plan to re-establish the original ridge and trough topography and to the extent possible, hydrology north to Tilden’s Woods.	High
Monitor the water levels in the troughs (sloughs) on a seasonal basis, over the long-term, to establish the current range of variation.	High
Thicket Swamp and Wet Meadow	
Prepare a Restoration Plan to restore the area between the swamp forest and Tilden’s Woods in conjunction with the Restoration Plan for the re-establishment of the ridge and trough topography in this area.	High
Continue to implement the Exotic Species Management Plan with priority on common reed and European frogbit.	High
Undertake a study to map the location and extent of wet meadow in the Park, especially along the area adjacent to the interior sand plain.	Medium
Assess the feasibility of removing the dug canals, and restoring the natural topography.	Medium
Initiate a hydrological investigation to determine the relationship between the sand plain and the marsh.	Low
Marsh	
Evaluate habitat requirements of marsh wildlife to determine the optimum interspersions that will benefit the biodiversity in the marsh.	High
Develop a Fire Management Plan, consistent with the recommended Vegetation Management Plan to manage interspersions of cattails and open water in the marsh.	High
Continue to implement the Exotic Species Management Plan with priority on common reed, purple loostestrife and European frogbit.	High
Record and monitor barrier beach breaching events.	High
Establish regional partnerships with the objective of re-establishing an ecological connection to Hillman Marsh.	High
Investigate the presence of seepage zones in the marsh and presence of any associated calciphiles.	Medium
Conduct a study to determine the hydrological relationship, if any, between the marsh and adjacent sand barrens to the west, with respect to local recharge/discharge systems.	Medium
Assess the feasibility of removing or controlling numbers of carp in the marsh.	Low
Investigate the potential impacts on water quality associated with eutrophication from old, decaying septic systems and develop a mitigation plan to eliminate the impacts.	Low
Investigate potential impacts and mitigation associated with the old dump in the marsh.	Low

Management Actions	Priority
East Beach Wet Meadows	
Investigate and map the current extent of wet meadows along the east beach where it intersects with the marsh, including updating the status of the significant species recorded from there.	High
Determine the impacts to this vegetation unit and assess the feasibility of restoring this unit along the East Beach.	Medium
Cultural Old Field (at DeLaurier House)	
Develop a Management Plan to maintain a small area of open field in the vicinity of DeLaurier House.	Medium
Conduct research to determine whether there are native surrogates for the plant species that typically occur in abandoned agricultural fields that would give a visual impression suitable for interpretation.	Low
VEGETATION MANAGEMENT - MIDDLE ISLAND	
Undertake a Vegetation Management Plan for Middle Island.	High
Pursue strategies for controlling cormorant populations on Middle Island.	High
Develop plans for the control of non-native plants on Middle Island.	Medium
VEGETATION MANAGEMENT - STURGEON CREEK	
Implement the Sturgeon Creek Restoration Plan (Parkinson 1991) including monitoring the survival and growth of planted trees.	Low
SPECIES MANAGEMENT - MAINLAND POINT PELEE	
Plant Species At Risk - Extirpated from Mainland Point Pelee National Park	
Search for smartweed dodder during searches undertaken for wild potato vine as it is an associated species.	High
Develop generic guidelines or criteria to evaluate the desirability and feasibility of re-introducing extirpated plant species.	Medium
Evaluate Smartweed Dodder as a candidate for re-introduction.	Low
Plant Species At Risk - Declining at Mainland Point Pelee National Park	
Evaluate the current status of each species and implement temporary measures to secure any species that are in imminent danger of being extirpated from the Park.	High
Determine cause(s) for the declines in these species.	High
Prioritize actions for securing declining species based on the urgency for action that will prevent species becoming extirpated in the Park.	High
Implement the management actions associated with the VMOs in order to restore the habitat conditions in which these species occur, thus providing sustainable conditions for their long-term persistence in the Park.	High
Implement any species-specific management actions recommended in Recovery Plans.	High
Undertake a white mulberry removal program in order to minimize hybridization with the endangered red mulberry.	High
Plant Species At Risk - Secure at Mainland Point Pelee National Park	
Assess and respond to any threats to these species.	High
Evaluate impacts, if any, of purple loosestrife on swamp rose mallow and respond accordingly.	High
Common hop-tree and Carolina whitlow-grass needs will be addressed through the Eastern Prickly Pear Cactus-Lake Erie Sand Spit Savannas Recovery Strategy and Action Plan(s).	Medium
Continue to evaluate any potential impacts to the habitat of these species that may result from management actions for specific vegetation types.	Low
Plant Species At Risk - Native to Ontario but not to Mainland Point Pelee National Park	
Any honey locust that are known to be planted should be removed to prevent any contamination of the native gene pool.	High

Management Actions	Priority
Plant Species that May Never have Occurred at Mainland Point Pelee National Park	
Determine the origin of all species records for which insufficient information exists to confirm presence or absence in the Park.	Medium
Verify, where possible, the presence of species and approximate location of the species within Park borders based on original documentation and recollection of authors and botanists.	Medium
Verify, where possible, the identity of the species based on specimen records retained in herbariums, museums or other holdings.	Medium
Undertake a vigorous search for each species in the appropriate habitat and/or location of the original record(s).	Medium
Plant Species with Unknown Population Status at Mainland Point Pelee National Park	
Determine and trace the origin of all species records for which insufficient information exists to ascertain status of each species in the Park.	Medium
Verify, where possible, the habitat and/or species associations and/or approximate location of the species within Park borders based on original documentation and recollection of authors and botanists.	Medium
Undertake a vigorous search for each species in the appropriate habitat and/or location of the original record(s), and collect information on location, population sizes, threats, etc.	Medium
SPECIES MANAGEMENT - MIDDLE ISLAND	
Plant Species At Risk - Extirpated from Middle Island	
The possibility of re-introducing these species to Middle Island should be investigated.	Low
Plant Species At Risk - Declining on Middle Island	
Evaluate the current status and implement temporary measures to secure any species that are in imminent danger of being extirpated from the Park.	High
Determine cause(s) for the declines in these species.	High
Implement the management actions associated with the VMOs in order to restore the habitat conditions in which these species occur, thus providing sustainable conditions for their long term persistence in the Park	High
Implement any species-specific management actions recommended in recovery strategies or action plans.	High
Prioritize actions for securing declining species based on the urgency for action that will prevent species becoming extirpated in the Park.	Medium
Plant Species At Risk - Secure on Middle Island	
Continue to evaluate any potential impacts to the habitat of these species that may result from management actions.	High
Assess and respond to any threats to these species.	Medium
Plant Species With Unknown Population Status on Middle Island	
Consideration should be given to re-assigning these species as being extirpated from Middle Island.	Medium