HURON-CLINTON METROPOLITAN AUTHORITY

EASTERN PRAIRIE FRINGED ORCHID MANAGEMENT PLAN

2023-2028

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HURON-CLINTON METROPARKS

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EXECUTIVE SUMMARY

The Huron-Clinton Metropolitan Authority (HCMA; Metroparks) has a long legacy of active stewardship managing the extensive wildlife and ecosystems cherished throughout the Metropark system.

As part of this ongoing commitment, the Metroparks remains focused on preserving the native ecosystems and recreational open spaces within the park system which consists of 13 parks throughout Livingston, Macomb, Oakland, Washtenaw, and Wayne counties.

Through wide-ranging efforts, the goal has always been and continues to be creating a balanced and functional environment for the native plants and animals who call the parks home. Climate change, invasive species, and the pressures of surrounding land use present an ongoing threat to the integrity of these ecosystems. The ecosystems stand a greater chance of long-term survival and have an opportunity to thrive when concerted monitoring is combined with analysis of available scientific data and a review of best practices from around the state and country.

The Metroparks oversees and manages more than 25,000 acres throughout the park system encompassing developed and undeveloped land. Its goal is to protect and restore natural diversity while balancing ecological stewardship with compatible recreational uses. This is a responsibility the Metroparks takes very seriously. It is imperative to act to preserve the robust diversity of plants and wildlife found in the parks for future generations.

This Eastern Prairie Fringed Orchid (EPFO) Management Plan is a compilation of research, documentation of best management practices, historical overview of EPFO biology and range, and a framework guiding how the Metroparks will manage this species into the future in an effort promote the recovery of EPFO at Lake Erie Metropark and beyond.

Eastern Prairie Fringed Orchid is a state and federally listed endangered species, and has been in decline for decades, largely due to destruction and loss of habitat that this plant relies on. At the Metroparks, we are fortunate to have a wealth of rare habitats across our 13 parks, including at Lake Erie Metropark. Lake Erie Metropark is home to some of the only remaining lakeplain habitat in Michigan, a globally rare ecosystem that is home to a variety of important species including EPFO.

Lakeplain habitats are so rare due to their characteristics of being flat, relatively free of large glacial boulders, and wet. These features have made them ideal locations to drain for farming, or construction and development. The Metroparks is fortunate enough to be the stewards of several hundred acres of this rare habitat, and in the position to promote the recovery of important species in this habitat including Eastern Prairie Fringed Orchid. In this plan, we begin the steps necessary to promote the long-term recovery of this species, and to preserve its place on the landscape of Michigan for future generations to cherish.

Research and Analysis

This comprehensive review is done to ensure the latest, best, and most effective practices are used to manage rare and vulnerable species at the Metroparks. Plants are a significant component of the foundation of all ecosystems' function. When this foundation begins to crumble, there is a cascading effect that alters other levels of the food chain and other species of wildlife including insects, birds, and mammals. The protection of existing populations of EPFO and recovery of the species, by expanding available habitat and populations, is an integral goal to the overall preservation of natural resources at Lake Erie Metropark. This review of relevant research and analysis will guide the creating of a framework to manage this species at the Metroparks and ensure the recovery of these rare resources that we steward.

RESEARCH

Introduction

The Huron-Clinton Metropolitan Authority (HCMA; Metroparks) Eastern Prairie Fringed Orchid Management Plan encompasses wide-ranging efforts to manage ecosystems and recreational open spaces within the Metropark system. By working towards a balanced and functional environment, endangered plants and animals (including Eastern Prairie Fringed Orchid) contained within these ecosystems stand a greater chance of long-term survival and have an opportunity to thrive.

Impacts on Eastern Prairie Fringed Orchid

An ecosystem is a geographic area where plants, animals, and other organisms, as well as weather and landscapes, work together to form a bubble of life. An ecosystem can seem healthy at first glance but may be experiencing an invisible ecological disturbance.

HERBIVORY

Herbivory is defined as "the state or condition of feeding on plants." Herbivores are a natural and integral presence in almost every ecosystem, but can present a direct threat to threatened and endangered species recovery. Most herbivores are opportunistic and selective browsers; consuming what is available to them in the area as well as choosing browse based on nutritional value. Deer, rabbit, and other herbivores impact the food chain (trophic levels) directly and indirectly, in addition to other environmental factors such as soil nutrients and resource availability for vegetation (Patton et al., 2018). When herbivores select an entire plant species in one area this will harm not only the individual plant species but also other organisms within the area, creating a ripple effect (Shelton et al. 2018).

Deer and other herbivores enjoy browsing various wildflowers, including Eastern Prairie Fringed Orchid. Preferential browsing by herbivores can contribute to the decline of species if herbivore density is abnormally high, or a flowering plant species density is low, or both as in the case of EPFO at Lake Erie Metropark. EPFO relies on the flowering body it produces annually to attract pollinators. Pollination is propagated primarily by three species of hawkmoth, which possess specially adapted tongues, or proboscis, that are able to reach the nectar within the flower of EPFO. As EPFO become browsed (where the flower is consumed by an herbivore), these pollinator moths can have an increasingly difficult time pollinating remaining EPFO. Distance between individual plants or populations of plants can contribute to decline in species as pollination becomes more difficult.

GENETIC DIVERSITY

Another complication of this increasing loss of individuals or populations is a progressive decrease in genetic diversity. This concept is often referred to as genetic bottlenecking, where gene exchange between diverse groups of plants is unable to occur due to the partial or total loss of a genetically distinct population, or increasingly disparate communities separated by large spaces. This decrease in overall genetic diversity can lead to a plant community being more vulnerable to rapid changes in environmental pressures such as herbivory, climate, wetness or drought, and a variety of other potential stressors. Gene exchange and diversity amongst individuals in a species protects the species from extinction and extirpation by avoiding a metaphorical “having all one’s eggs in a single basket” in terms of genetic adaptations and survival. In the case of EPFO, it is hypothesized that sufficient genetic diversity is required to produce viable seed, which may become increasingly difficult as populations become further isolated and genetically similar.

NATIVE LANDSCAPES AND INVASIVE SPECIES

In recent decades, concern has grown for the impact of invasive species on our native landscapes. An invasive species is a non-native species that presents a risk of harm to economic, environmental, or human health (Invasive.org, Invasive species 101 - an introduction to invasive species, 2018). This harm may be due to toxins or illness associated with the invasive species, or the fact that they take over an area leaving little room for anything else.

In Michigan, some common invasive plant species include garlic mustard (*Alliaria petiolata*), Japanese barberry (*Barberis thunbergii*), glossy buckthorn (*Frangula alnus*), tree of heaven (*Ailanthus altissima*), Asian bittersweet (*Celastrus orbiculatus*), and autumn olive (*Elaeagnus umbellata*). While these species have the potential to invade the wet-mesic lakeplain prairie habitats, looming larger is the threat of the invasive grasses Phragmites (*Phragmites*

australis) and reed canary grass (*Phalaris arundinacea*). These species of invasive grass are rapid colonizers and thrive in the full-sun, wet habitats that are home to the Eastern Prairie Fringed Orchid.

(Pictured above: Reed Canary Grass, Phragmites)

Repeated disturbances, changes in hydrology, and surrounding land use can contribute to the appearance and spread of these invasive species in an ecosystem. Once established, invasive species tend to "take over" a habitat, as they are not subject to the natural controls that balance native vegetation populations. Herbivores may choose not to utilize these plants for food, preferring native plants and flowers such as EPFO, further driving an imbalance and promotion of invasive plants. These tall reeds and grasses also contribute to the decline of EPFO as they shade out these full sun habitats and prevent the growth of new individuals.

SOILS AND HYDROLOGY

In most ecosystems, plant communities are determined by a combination of soils and hydrology. Soil plays an important role in an ecosystem; being made up of a combination of broken-down bedrock and decomposed organic material and serves as a major determinate of habitat (Dickman and Leefers, 2003). Soil is also home to bacteria and fungus that help break down waste present in of the rest of the habitat. They convert what would otherwise be waste into usable nutrients, like nitrogen, that plants depend on to grow. Soil is a full living system, and as such it is also vulnerable to change when the conditions around it change.

Hydrology pertains to the movement and distribution of water within an ecosystem. Disruptions in hydrology such as diverting water to or from a habitat for human purposes, failing infrastructure, or changes in surrounding land use can have a drastic effect on the makeup of a plant community. In particular, EPFO relies on a natural but cyclical fluctuation in hydrology and will suffer if alterations of the natural hydrology regime occur.

BIOLOGY OF EASTERN PRAIRIE FRINGED ORCHID

Eastern Prairie Fringed Orchid (*Platanthera leucophaea*) or EPFO, are native to Michigan and an important part of the natural community at Lake Erie Metropark. They are one species interacting with thousands of other plants and animal species in a complex ecosystem.

EPFO is a perennial herb with a complex life history (Bowles 1983). The orchid grows from an underground tuber, which is a type of rhizome that serves as a nutrient reserve. The flowering season for EPFO falls in mid June to early July, and only lasts for 7-10 days. Once flowered, pollination can occur. EPFO produces seed capsules containing thousands of tiny seeds, which are dispersed by the wind once seed capsules mature, dry, and burst in late August or September.

Eastern Prairie Fringed Orchid's unique biology and life cycle provide the capacity for an individual plant to store nutrients and regenerate the tuber rootstock and associated buds, providing the potential for each plant to survive for many years, and endure years with particularly bad growing conditions. However, there are several unique environmental conditions that must be met in order for this orchid to flourish.

In particular, studies seem to show that primary pollinators are confined to only a few species of nocturnal moths (Bowles 1983, 1985). These moths pollinate the nocturnally fragrant flowers of EPFO and have a specially adapted proboscis that allow them to access the nectar from the flower's long spurs. These moths, referred to as hawk moths or sphinx moths, have been detected in Michigan carrying pollen from Eastern Prairie Fringed Orchid, with the species *Eumorpha pandorus, Eumorpha achemon* and *Sphinx eremitis* represented (D. Cuthrell 1994).

EPFO blossoms often rise just above the surrounding vegetation, giving pollinators better access to the flowers, but also opening them up for herbivores, primarily deer. Specific conditions of a habitats soil dynamics must also be met to allow for the establishment and development of new individuals, and to ensure thriving of existing colonies. A mycorrhizal association must be made with a favorable soil-inhabiting fungus, a mutualistic exchange where fungi deliver soil nutrients and water to the seedling, and the seedling offers protection from environmental stressors (Stoutamire 1974). The seedling may remain underground for several years, feeding off these nutrients. Once the seedling emerges and begins to grow,

the relationship becomes symbiotic. This symbiosis is not wholly unique to EPFO, and is common in the orchid family, primarily facilitated by the fungal genus *Rhyzoctonia* (Smith 1966, Sanford 1974, Hadley 1970, Wells 1981).

Eastern Prairie Fringed Orchid appears to be pre-adapted to dormant season disturbances such as fires, or other damage, relying on the underground tuber as a reserve to colonize macro-disturbed areas. This strategy does however present a drawback, where EPFO are very vulnerable to early growing season disturbances. Newly seeded plants that are successful in establishment may remain underground for 5 or more years before emerging and flowering, even when presented with favorable conditions in successional habitats (Case 1987, Packard 1991). Some orchids may go completely dormant, and rarely reappear. Mechanisms that trigger dormancy and emergence are not well understood.

In addition to pollinators, soil conditions, disturbance, and seed establishment – precipitation seems to have an important role in promoting flowering of EPFO (Bowles 1983). In a study conducted in Illinois, EPFO flowering was highest in wetland habitats, and was positively correlated with growing season rainfall (Bowles *et al*. 1992). Drought also plays a role, potentially leveling the playing field and providing EPFO with a competitive advantage in wet years following a drought.

GENERAL EPFO MANAGEMENT BACKGROUND

Introduction

Eastern Prairie Fringed Orchid is an important species, historically present in only a few of the ecosystems in Michigan, most notably the Lake Plain Prairie ecosystem type. This ecosystem has since been split into Lakeplain Wet Prairie and Lakeplain Wet-mesic Prairie. The primary difference in these two habitats is the degree of water the habitat holds, and the makeup of the soils. Generally speaking, these habitats are lowland prairie communities that exist on relatively level, seasonally wet or inundated glacial lakeplains subject to cyclical disturbances of beaver flooding, fire, and great lakes water level fluctuations.

One of the primary factors contributing to the decline of the species is the loss and destruction of this habitat, or human factors that have drastically altered the hydrology or plant community makeup of these habitats. This loss of habitat has resulted in the ranking of this ecosystem as critically imperiled and rare on both state and global spatial scales. In addition to being home to a variety of important plant and wildlife species, it is home to several endangered species including the Eastern Prairie Fringed Orchid. Lake Erie Metropark is preciously unique in this regard, hosting an extremely rare ecosystem, and supporting a critically endangered species.

DISTRIBUTION, TAXONOMY AND PHYSICAL DESCRIPTION

Eastern Prairie Fringed Orchid is a member of the Orchid family (*Orchidaceae*) and a rare plant in most prairie habitats in its range. It's scientific name *Platanthera leucophaea* originates from *Platanthera* meaning "flat antlers" and *leucophaea* coming from the Greek words "leucon" for "white" and "phaios" for "gray", referring to the broad white or gray antler like flower of the orchid. EPFO is a rather stout orchid with a single stem, alternating leaves clasping at the stem, and parallel veins. A single orchid may have up to 20 or more flowers, each with an upper hood, and a lower lip divided into 3 lobes with fringed edges, giving the orchid its name. A mature orchid can grow to more than 3-feet tall and has been shown to survive for more than 30 years in garden environments.

EPFO is one of around 200 species of North American orchids, and was formerly lumped in with its close relative, the Western Prairie Fringed Orchid. These orchids used to populate vast prairies on their respective side of the Mississippi river and are now both endangered in their range. EPFO is federally endangered throughout it's range from Iowa west to Maine, and from Ontario, Canada south to Oklahoma. EPFO has declined more than 70% from original county records from the 1950s. In Michigan, 21 counties reported occurrences of EPFO in 1987 (Case 1987), and in 1999 less than 12 distinct populations in 9 counties were

reported. (Bowles 1999). These losses have come as a result of invasive species competition, over collecting for private gardens, and drainage and development of wetland habitats. An estimated 20% of these populations are considered adequately managed and protected.

MANAGEMENT OF ENDANGERED SPECIES IN URBAN/SUBURBAN AREA

The decline of an individual species can be attributed to a variety of reasons as discussed in this plan, but foremost is the development of habitat and conversion of wetlands into agricultural and residential lands. Lakeplain habitats provided ideal land for farming when drained by settlers, as it was free of trees, large glacial boulders, and had easy access to water for irrigation. Once drained, diverted water fully inundated adjacent lands, drowning out lakeplain plants that were not fully displaced by the agricultural and residential developments.

At the Metroparks, we have a dual mission to provide access to diverse recreational opportunities, as well as to protect the integrity of the natural resources within our parks, held in trust for the people of Southeast Michigan in perpetuity. This role can provide challenges as public access and recreational demands abut high quality, sensitive, or endangered natural features that demand protection.

The Metroparks natural resources department works in coordination with Operations and Maintenance staff, and the public, to provide for meaningful access into these habitats in a way that respects the protection of natural resource and allows recreation that is compatible with ecosystem conservation. With this plan and goal in mind, the Metroparks will continue to ensure that visitors are able to access these fantastic habitats, and that these unique resources will continue to persist for the future enjoyment of generations to come.

EDUCATION AND PUBLIC PERCEPTION

Education and public perception on the conservation of endangered species has improved dramatically since the listing of this species as federally endangered and opens up several opportunities for the Metroparks to engage with our visitors, staff, and the general public on this issue. Eastern Prairie Fringed Orchid is an asset unique to Lake Erie Metropark within our system and provides an opportunity for Metroparks Natural Resources staff to assist in the development and implementation of educational programs, materials, media, and signage to raise public awareness to the presence of this charismatic orchid. Natural Resources staff will work with Interpretive, Communications, and Operations staff at the Metroparks to highlight this important species and the work that goes into conserving it.

PUBLIC INFORMATION

The Metroparks are committed to the transparent sharing of information and creating awareness that best management practices are being pursued and data related to the protection and preservation of EPFO are being carefully assessed.

While HCMA endeavors to be transparent in the management of public lands, and particularly threatened and endangered species, there are elements of this plan that are kept to internal records for the purpose of protecting specific location data of habitats or populations related to the conservation of Eastern Prairie Fringed Orchid.

This protection of location data is in keeping with established best management practices to prevent collection or disturbance of threatened and endangered species. In this plan general best practices are documented and recommended, while habitat specific management plans will remain internal to staff. Relevant state and federal officials will be able to access these data on request, and members of the public may make specific inquiries to the Chief of Natural Resources and Regulatory Compliance of the Metroparks, wherein a determination of appropriateness will be made to release protected data. The public also has opportunities to express their opinion at regularly scheduled monthly HCMA Board of Commissioners meetings.

PREFERENTIAL BROWSING

Preferential browsing will continue to be a concern, and a hurdle in the recovery of this species at Lake Erie Metropark. While the Metroparks do monitor browse pressure in specific areas, the sporadic and inconsistent nature of EPFO populations will make characterization of this pressure difficult. Deer browse of mature flowers has been documented in known habitats and will likely continue to be a factor in successful establishment of new populations.

Several methods to reduce this pressure can be pursued, including management of deer populations in accordance with the Metroparks approved Deer Herd and Ecosystem Management Plan. Other methods may include physical barriers such as exclosure fencing around known populations, deer resistant vegetation around the perimeter of suitable habitat, or other novel techniques to lower browse pressure on this species, and allow for successful flowering, pollination, and establishment of new populations.

SOIL DISTURBANCE AND PRESERVATION

Soil makeup and health has been shown to be an important function of the establishment and recovery of EPFO and should be considered as the Metroparks looks to enhance existing occurrences of EPFO, or culture the expansion of the species into suitable adjacent habitats. The adaptation of soils to include appropriate fungi will be used as an approach to improve conditions for establishment.

Along with protection and enhancement of soils in EPFO habitats and suitable lakeplain prairie habitats, measures will be taken to protect disturbance of both topsoil and subsoil habitats. The biological adaptation of an underground tuber in EPFO may make this species particularly susceptible to soil disturbance and would call for an increased effort to reduce soil disturbance in these habitats. This includes the use of these areas for seasonal event parking, consideration of equipment used to perform dormant season maintenance mowing, and the installation of physical barriers to prevent off-road vehicle trespass in the habitat of documented EPFO occurrences.

SPREAD OF SEEDS

Plants have adapted many ways in which to spread seed beyond the immediate area. While dynamics of seed propagation and establishment are not completely understood in the case of EPFO, there are methods that can be applied to enhance viability of seed, and overall recovery and improve distribution of the species across available habitat. As previously discussed, mycorrhizal symbiosis is integral to establishing new seedlings, and should be considered in any seed propagation project.

Additionally, limited collection of mature seed pod material for propagation within a controlled environment, such as a lab or classroom, and reintroduction to suitable habitat may be a vector to improve chances for recovery of the species at Lake Erie Metropark. The genetic makeup of the EPFO community at Lake Erie Metropark may also be a consideration for the future success of recovery efforts. Spatially separated populations may be candidates for cross pollination in a laboratory or classroom environment, whereby increased local genetic diversity and be preserved and enhanced. This consideration will likely be integral to the success of a long-term recovery effort.

INVASIVE SPECIES MANAGEMENT

Critical to the success of the recovery effort for EPFO will be the continued strategic control and management of invasive species at Lake Erie Metropark, more specifically in the habitats known to contain occurrences of EPFO. The control of invasive grasses such as Phragmites and reed canary grass should be a priority in preventing further loss of Eastern Prairie Fringed Orchid populations and habitats and should be addressed immediately through an integrated strategy of controlled burning, herbicide application, strategic mowing, and other established best management practices. It should be considered that invasive species management may have a detrimental effect on pollinator and fungi health within the habitat, and thus should be approached from a minimum effective, low-impact vector.

MOWING

The Metroparks Natural Resources department maintains a mowing plan, reviewed continually on a 5-year basis. In this plan all documented EPFO habitats are designated as

Natural Area or Annual Spot-mow, and not subject to regular mowing. Best practices are established in this plan which dictate months in which mowing can be conducted, and how mowing must be addressed in unusual circumstances, which involve consulting the Chief of Natural Resources and Regulatory Compliance. Any mowing that would occur within an EPFO habitat would be subject to best practices established in this plan, principally to avoid the critical early growing season stages of the orchid. Dormant season mowing at the Metroparks is established in the mowing plan, described as November - February annually, as of the writing of this plan in 2023. For more information, refer to the Metroparks Mowing Plan.

PRESCRIBED FIRE

Prescribed fire at the Metroparks is conducted by both internal and contracted staff. Each prescribed fire unit is unique and has specific parameters that must be met and approved by the Metroparks Chief of Natural Resources and Regulatory Compliance, or Natural Resources Coordinator, as well as the local jurisdiction's fire chief. As of the writing of this plan, no EPFO habitats are contained within established prescribed fire management units. This will likely change as this plan is implemented, and prescribed fire is used as a strategic tool in the management of EPFO habitat. These prescribed fire protocols will provide parameters specific to the conduct of prescribed fire within EPFO habitats, and will be closely monitored to evaluate efficacy, and document changes in presence of EPFO post-burn.

Reasons for decline, barriers to success, and prospective strategies

The following challenges are major contributors to the decline of EPFO as described in a report delivered to the U.S. Fish and Wildlife Service (Bowles, 1999) and are addressed here.

HABITAT DESTRUCTION

Identified as the primary reason for decline of the species, the Metroparks should take vigorous steps to eliminate destruction of known or prospective habitat for EPFO. This includes the alteration of adjacent lands that would contribute to the decline of EPFO on Metroparks property. This may take the form of adjacent land development, pollution, hydrologic regime change, or recreational or commercial activity.

FIRE SUPRESSION AND WOODY VEGETATION ENCROACHMENT

The Metroparks has a history of prescribed fire implementation for several decades and should move to include known EPFO habitat in prescribed fire management units as suitable and keeping with best management practices. EPFO habitats will require a much different approach and plan when considering the application of prescribed fire, as there are many other considerations listed in this plan that are not conducive to a general prescribed fire program. EPFO's status as an endangered species will demand extra planning, attention, and modification of equipment and practices be pursued in keeping with all aspects of this plan and the conduct of prescribed fire.

While woody vegetation encroachment is not a large concern in habitats at Lake Erie Metropark with documented occurrences of EPFO, distributions should be tracked and assessed to prevent shrub encroachment. Periodic prescribed fire, herbicide application, dormant season mowing, and mechanical control are methods that might be employed in the maintenance of EPFO habitats.

IMPACTS ON POLLINATOR POPULATIONS

The Metroparks has an existing protocol of utilizing pollinator friendly products, but special attention should be paid to habitats containing EPFO. This is the case particularly in the habitats in proximity to the Lake Erie Golf Course, where pesticide use parameters are generally looser, to provide the best conditions for golfers and the course. While this is an important recreational asset, there are likely some areas in which reductions or adaptations can be made in golf course practices, that will lessen the impact on pollinator species, specifically surrounding documented occurrences of EPFO.

Vectors of pollinator species exposure to pesticides occurs largely in waterbodies, where pesticides applied to turf surfaces may run off into insect drinking water areas. Particular attention should be given to the use of Neonicotinoids, and the use of these insecticides should be discontinued in all areas at Lake Erie Metropark. Additionally, Metroparks staff will assess surrounding land use and its impact on pollinator populations, in accordance with the objectives of the recovery of EPFO in this plan.

COMPETITION FROM NON-NATIVE PLANT SPECIES

Natural resources staff currently have a sophisticated protocol for addressing the presence of non-native plant species and will adapt these long-established best practices in accordance with the preservation of the goals in this plan. Special attention will be given to the removal of Phragmites and reed canary grass from known or suitable habitats at Lake Erie Metropark.

OVER-UTILIZATION FOR COMMERCIAL AND SCIENTIFIC PURPOSES

While this threat contributed significantly to initial decline of the species, Eastern Prairie Fringed Orchid's current status as a state and federally protected endangered species prevents much of this continued decline. Metroparks Natural Resources staff will work in conjunction with Operations, and Police staff to monitor habitats and prevent trespass in

known EPFO habitats. The rural and open nature of these habitats does contribute to trespass by recreational off-road vehicle users. Criminal trespass laws will be enforced with the support of Metroparks Police in order to avoid further destruction of habitats, or orchids themselves. This may also include the installation of fencing or cameras to prevent and pursue offenders.

REGULATORY MECHANISMS

Regulatory mechanisms may have prevented the protection of EPFO populations in the past, as populations of private lands were not subject to regulation, or as personal property protections prevented the positive identification of likely existing EPFO populations. At the Metroparks, we have and will continue to take steps to protect EPFO habitat and populations, which may include seeking state and federal permits to perform management in habitat areas to enhance the recovery of the species and making incremental updates to this plan within the 5-year approval period.

2023 - 2028 EASTERN PRAIRIE FRINGED ORCHID MANAGEMENT PLAN

Introduction

Managing Eastern prairie fringed orchid populations within the Huron-Clinton Metroparks is a necessary part of managing the parks for the foreseeable future. As stewards of the parklands, if we are to repair and preserve the biodiversity within the parks, as well as maintain the health and integrity of each of the unique ecosystems with our parks, we must have a plan and processes for how we preserve Eastern prairie fringed orchid populations and protect the ecosystems that sustain them. We see this as a necessary part of our mission to sustain these important habitats for the enjoyment of future generations.

The Metroparks will continue to build on the original research work providing the background for this plan, incorporate results of active management experience and, review new research and information gathered on an annual basis.

Assessment of EPFO populations using various survey techniques and monitoring of changes in the population dynamics within each specific habitat will continue throughout the program. Working with interested groups, federal and state agencies, and across all staff departments at the Metroparks, this program will continue to assess efficacy of established best management practices and the response of the EPFO community, and evaluate and pilot emerging methodologies that may develop in the EPFO research community.

Management Goal

The goal of this management plan is to guide the methodology and task development for the preservation and recovery of Eastern Prairie Fringed Orchid populations at the Metroparks, and specifically at Lake Erie Metropark. This plan will provide a framework for organizing, assigning, conducting, and evaluating annual work plans to address all aspects of species recovery. Utilizing this plan and associated framework will ensure that the recovery of EPFO continues to be a goal for the Metroparks Natural Resources Department and ensure the future existence of this species on the landscape.

Methods of analyzing EPFO population dynamics, and assigning management tasks

The decision to implement management activities and strategies in specific EPFO habitats will be considered on an annual basis, based on observed community response to previous management, current best practices, and centered first around the principal of preservation of existing populations, followed by potential for expansion or recovery.

The following steps will be implemented to provide analysis of EPFO population dynamics and will be mapped to specific and varied habitats that contain, or have the potential to contain, EPFO populations. This analysis will occur on an annual basis, with solicitation of input from internal and external partners.

1. Organizing

On an annual basis, prior to the growing season, staff will perform an assessment of previous field season efforts, identify any trends within specific populations or species recovery as a whole. Special attention will be paid to recorded decreases in abundance, and presence of previously undocumented occurrences of EPFO. Each occurrence shall be assigned to an established management unit. If spatially distinct from existing management units, establishment of a new management unit to contain occurrences should be evaluated and established in coordination with the Chief of Natural Resources and Regulatory Compliance.

2. Assigning

Methods of survey and management should be assigned to each specific management unit and documented in the staff handbook on an annual basis, immediately following organizing and planning of annual management tasks. Preliminary steps would likely involve planning of survey in established management units and assigning staff to that survey task. Results of survey would then be incorporated into further assignment of management tasks including dormant season mowing, invasive species control, prescribed fire, seed collection, and installation or maintenance of physical barriers.

One exception may be prescribed fire, which will be conducted prior to April 15th annually, and will be identified as a management task in the previous year's management unit plan. Metroparks Chief of Natural Resources and Regulatory Compliance, and Natural Resources Coordinator will be responsible for assigning management and survey tasks to staff, and ensuring tasks are carried out and recorded in keeping with best management practices.

3. Conducting

Once specific management unit plans are determined and assigned, Natural Resources staff will ensure that tasks are carried out at the appropriate time, by appropriate staff. Conduct of prescribed fire, mowing, herbicide applications, physical control of invasives,

and installation of barriers will be carried out according to best practices identified in the background section of this plan. Additionally, survey methodology will be conducted according to the specific task assigned to each management unit. This methodology may vary based on habitat size, ground conditions, time of year, goal of survey, and available staff. Regardless of management task, staff will take special care in conducting these operations in EPFO habitat and be aware of and report any changes in the habitat observed.

4. Evaluating

Once management activities have been developed, assigned, and executed, reports will be made by field staff and gathered in an annual report prepared by the Natural Resources Coordinator in conjunction with the Chief of Natural Resources and Regulatory Compliance. This report will be generated on an annual basis and delivered to Metroparks leadership or the Board of Commissioners. As with other aspects of this plan, location specific details will be excluded from public reports in keeping with best practices for the management of endangered or threatened species. Based on outcomes or observed trends, framework or methodologies will be adjusted to improve performance of the program on an annual basis.

Plan Evaluation

The effectiveness of the Eastern Prairie Fringed Orchid Management Plan will be evaluated every 5 years using the methods of analyzing stated previously. The methods used to manage EPFO habitats will also be evaluated and compared annually using criteria including:

- Safety of the management technique
- Percentage of positive response indicators in all management units
- Cost effectiveness of each method and correlated positive ecosystem responses
- Change in spatial distribution of the species within each management unit
- Change in abundance of the species within and across management units
- Input and comments from staff and regulators
- Keeping of best practices established in this plan, as compared to emerging methods

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APPENDIX 1: HISTORY OF STAFF EFFORT TO PRESERVE EPFO

Eastern Prairie Fringed Orchid was first documented at Lake Erie Metropark in 2004, by Michigan Natural Features Inventory during a botanical survey of various habitats, and later located by Metroparks staff in that same year.

Prior to 2018 very little Metroparks staff efforts were directed at the preservation of EPFO. Any effort in this area may not have been documented and was not able to be incorporated into this appendix. In 2018 Metroparks staff were directed to begin work on the development of this plan, to manage the populations of the endangered orchid at Lake Erie Metropark.

In 2018, Natural Resources staff spent several days surveying for EPFO at locations identified in the 2004 MNFI report. Most locations were assessed and found to be heavily encroached upon by invasive Phragmites, or woody shrubs. Assessments at that time determined that these locations were very unlikely to support recovery of the species and would require significant effort and resource allocation from HCMA staff. At that time Metroparks Natural Resources staff began to research and assess potential trial efforts to help species recovery, understanding confidence in success was low.

During these surveys conducted over the span of several weeks, from emergence, to flowering, to seed production life cycle stages, staff surveyed known and potential EPFO locations, recording presence of plants or flowering stalks observed, and recording GPS location data for these occurrences.

These initial efforts in 2018 provided direction for the further development of the full Eastern Prairie Fringed Orchid Management Plan. Field survey of known EPFO habitat was conducted again in 2022, resulting in the location of several flowering orchids and collection of associated data, for inclusion in future management planning.

APPENDIX 2: SCOPE OF PLAN AND RESPONSIBILITIES

Purpose

To responsibly manage the Metroparks Eastern Prairie Fringed Orchid population using a variety of established best management practices, in a manner that is safe for staff and park visitors and consistent with the conservation and recovery of this endangered species.

Scope

All HCMA Metroparks with documented EPFO populations, currently applicable only at Lake Erie Metropark.

Responsibilities

CHIEF OF NATURAL RESOURCES AND REGULATORY COMPLIANCE

- To work with the Michigan Department of Natural Resources (MDNR), U.S. Fish and Wildlife Service (USFWS), and other relevant regulatory agencies, to establish specifications and guidelines regarding management of EPFO habitat and secure required permissions and permits.
- To lead analysis of population recovery metrics, guide development of annual seasonal tasks, and direction and appointment of staff to specific plan elements.
- Supervise and assist the Natural Resources Coordinator in the development of annual report of management activities, data collection, and trend assessment.
- In cooperation with the Natural Resources Coordinator, to establish guidelines for and oversee conducting of EPFO habitat surveys throughout known and potential habitats.
- To collect data, track trends, provide accounting of permits and process, and prepare activity reports as required by the MDNR or USFWS.
- In cooperation with the Park Operations and Maintenance staff, to facilitate access to and protection of known and potential EPFO habitat, in the service of goals defined in the Eastern Prairie Fringed Orchid Management Plan.
- To prepare and present annual EPFO Management Report to the HCMA Board of Commissioners as determined by the Director.
- To address, supervise, or delegate all other duties not included herein.

NATURAL RESOURCES COORDINATOR

- In coordination with and under the direction of the Chief of Natural Resources and Regulatory Compliance, oversee development of field tasks, data collection, management activities, and assessment of population dynamics and trends.
- In cooperation with and under the direction of the Chief of Natural Resources and Regulatory Compliance, to facilitate the access to and protection of known and potential EPFO habitats for the purpose of survey, data collection, annual maintenance tasks, or other activities as directed.
- To assist in the collection of data and writing of reports as directed by the Chief of Natural Resources and Regulatory Compliance as pertains to permits required by MDNR or USFWS for EPFO management plan activities conducted at the Metroparks.
- To assist in the preparation of training methodologies, and leading training of Metroparks field staff in all aspects of EPFO management tasks, in coordination with the Natural Resources General Supervisor and Natural Resources Supervisor.

NATURAL RESOURCES GENERAL SUPERVISOR

- Schedule or assign employees as necessary for EPFO management activities, tasks, and trainings.
- In cooperation with the Natural Resources Coordinator, and under the direction of the Chief of Natural Resources and Regulatory Compliance, oversee, direct, develop, and lead the training of field personnel as pertains to EPFO management plan field tasks.
- In cooperation with the Chief of Natural Resources and Regulatory Compliance, to facilitate the execution of assigned management tasks in the appropriate timeframe consistent with best management practices identified in the EPFO management plan.
- In cooperation with the Natural Resources Supervisor, to oversee and supervise field staff in the conduct of management activities and tasks, and to ensure safety and quality of work conducted in the field.
- To ensure that Natural Resources Department equipment and field staff are prepared to execute assigned tasks pertaining to the management of EPFO.
- In cooperation with and assistance of the Natural Resources Coordinator, to notify all relevant Operations and Maintenance staff of upcoming EPFO management activities, and coordinate access to habitats in order to execute planned field work.
- In cooperation with the Natural Resources Coordinator and Chief of Natural Resources and Regulatory Compliance, engage park maintenance staff in the execution of field tasks related to the management of EPFO habitats where able.
- To track all employee and equipment costs associated with EPFO management activities and submit that information to the Chief of Natural Resources and Regulatory Compliance as requested.

NATURAL RESOURCES SUPERVISOR

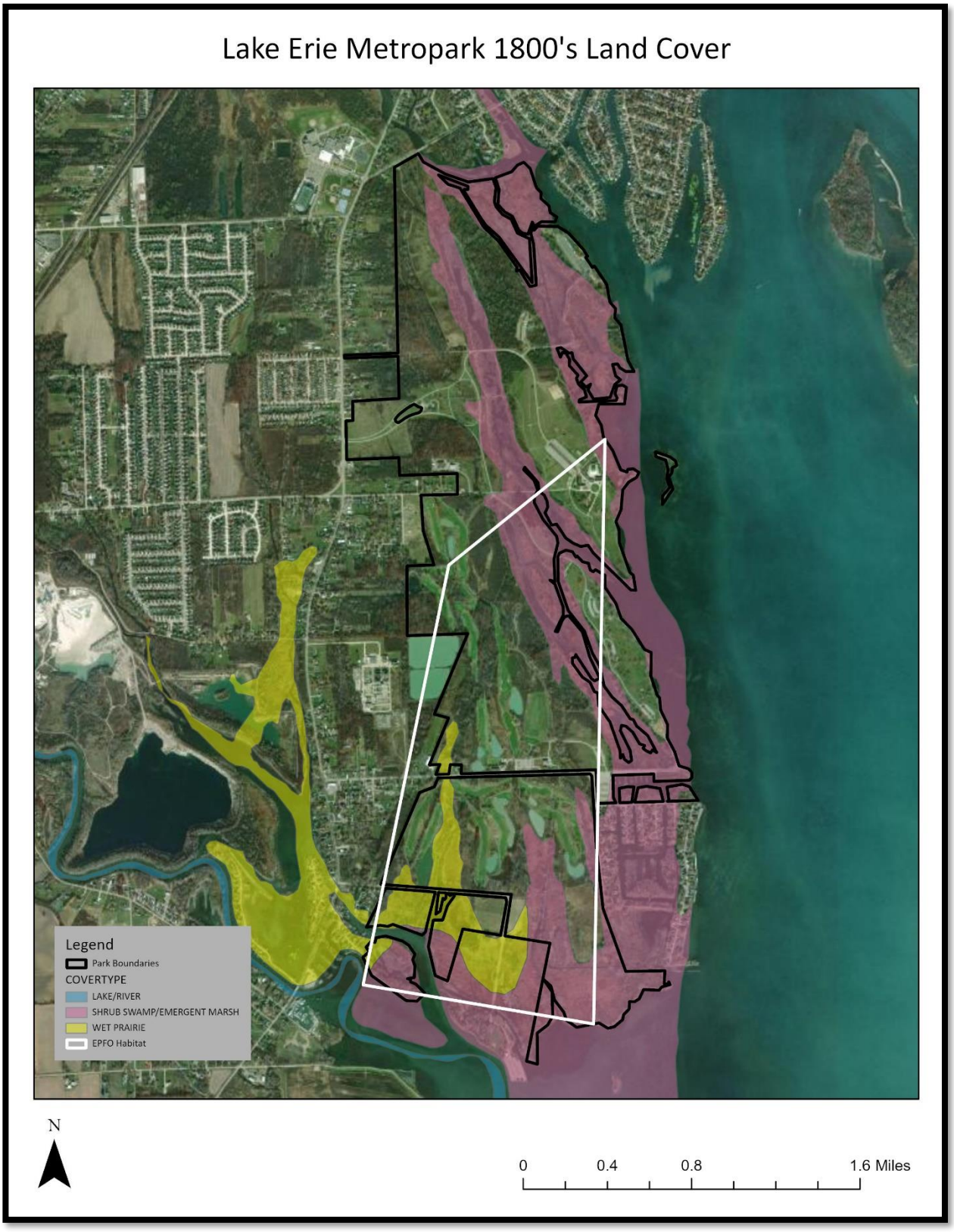
- In cooperation with and under the direction of the Natural Resources General Supervisor, assign and direct staff in the execution of assigned EPFO management plan tasks, and collection of associated data.
- In cooperation with Natural Resources General Supervisor, supervise and train field staff in the conducting of EPFO management plan activities and best management practices.

MISCELLANEOUS

- All Metroparks staff will take measures to protect sensitive location data pertaining to the management of EPFO and avoid incidental damage to habitat during survey or management activities.
- Any third-party access to sensitive data or habitats will be strictly administered and monitored by the Chief of Natural Resources and Regulatory Compliance.
- Any contracted management work within known or suspected EPFO habitats will be subject to the associated responsibilities identified in this appendix as applicable.

APPENDIX 3: EPFO MANAGEMENT BOUNDARY MAP

The attached map delineates the broad EPFO management boundary, referenced with historical, pre-European settlement land cover ecosystem types at Lake Erie Metropark.



APPENDIX 4: EPFO MANAGEMENT PLAN STAFF HANDBOOK

[This appendix of the EPFO management plan is maintained as an internal document. This handbook provides location data for known populations of EPFO and guides implementation of habitat management tasks specific to individual EPFO management units.]

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