

- 1952 Alderman Lake dam is constructed.
- 1970 The Ford Lodge Annex is converted to an environmental education center.
- 1980 State acquires a small parcel just south of the Dodge #10 unit which includes a small family cabin and stone outdoor stove. The cabin appears to date to the 1940's. The cabin is available to the public for rental as a rustic cabin.
- 1999 The Ford lodge is destroyed in a fire. The perpetrators were later apprehended and convicted of arson.

LAND OWNERSHIP AND ISSUES

Funding Sources

The lands that comprise the HRA have been acquired by the state through a variety of funding sources. Often, conditions attached to the original funding source or other details of the property transaction encumber the future use or disposition of the land.

The funding source map that follows this section identifies the varieties of sources used in acquiring land within the HRA. Multiple sources may have been utilized, particularly in areas where small fragmented parcels were aggregated.

[General Fund](#)

Acquisitions through the General Fund include properties that were purchased with monies from the state's general fund, and not associated with a specific revenue stream or bond program.

[Michigan Natural Resources Trust Fund \(MNRTF\)](#)

The trust fund was established in 1976 to provide a source of funding for public acquisition of lands for resource protection and public outdoor recreation. Funding is derived from royalties on the sale and lease of state-owned mineral rights. It is utilized for general program purposes.

[Game and Fish Funds \(a.k.a. the State Game and Fish Protection Fund\)](#)

This fund was established in 1921 and is financed principally by the sale of hunting and fishing licenses. The license fees are set by statute and their purpose is to support the conservation program for preservation and control of fish and wildlife. The fund also receives funding from the investment earnings of the Game and Fish Protection Trust Fund. The fund provides financial support for state-wide hunting and fishing programs, including resource management, research, enforcement of hunting and fishing laws, and acquisition of lands to be used for hunting and fishing purposes.

[State Game and Fish Protection Trust Fund](#)

The Game and Fish Protection Trust Fund was created under the provisions of Public Act 73 of 1986. The Game and Fish Protection Fund provides revenues for the operation of the DNRE's Fish, Wildlife, and Law Enforcement programs in the Department. Management, research, enforcement of fishing and hunting laws and acquisition of lands to be used for hunting and fishing purposes are examples of uses of this fund.

[Pittman-Robertson Fund](#)

The program was designed for wildlife restoration and hunter education and may be used for range development programs. The intent of the act is to conserve and manage wild birds and mammals, and to enhance the safety, marksmanship and sportsmanship with firearms and bows and arrows. Therefore, in 1937 Congress enacted specific legislation to provide funds to states to carry out these programs. By law, (16 USCA 669a-i) the Interior Department is authorized to cooperate with the various states in wildlife restoration projects and hunter education, provided that the various states assent to the Federal provisions and pass laws for the conservation of wildlife, which will include a prohibition against the diversion of license fees paid by hunters for any purpose other than the administration of the State Fish and Game Department. (Sec. 669).

[Recreation Bond Fund](#)

This fund was established in 1988 and operates under Parts 196 and 715 of P.A. 451 of 1994, as amended. The fund was created from the proceeds and investment earnings of a bond package approved by the voters in November 1988 to finance state and local public recreation projects.

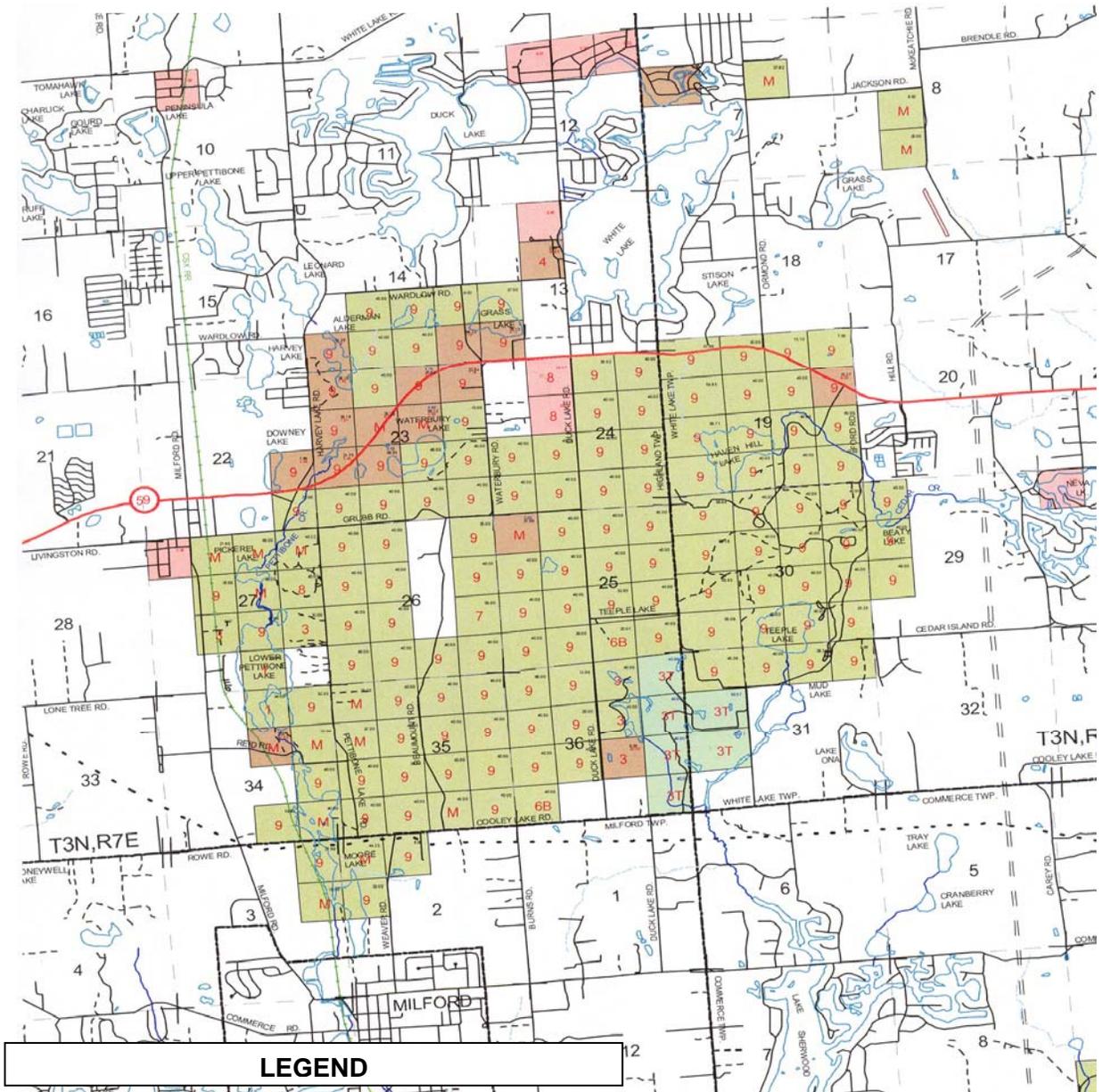
[Michigan Land Trust Fund](#)

The State Constitution was amended in 1984 to provide for a "Michigan Natural Resources Trust Fund" which was implemented in 1985. Most rentals, royalties, and other revenues derived from mineral, coal, oil, and gas interests on State-owned land are credited to the fund. Public Act 451 of 1994 redirected a portion (\$10 million per year) of these revenues previously committed to this fund, to the Michigan State Parks Endowment Fund. Appropriations are used to fund grants to local units of government as well as State agencies to acquire or develop outdoor public recreation facilities.

[Gift](#)

These properties were provided to the state as a donation from private individuals or entities.

FUNDING SOURCES FOR HIGHLAND RECREATION AREA



LEGEND

<p>FUND CODES</p> <ul style="list-style-type: none"> 1 State Game Fund 3 Michigan Land Trust Fund 3T Michigan Natural Resources Trust Fund 4 Game and Fish Fund 6B Recreation Bond Fund 7 Pittman-Robertson Fund 8 Gift 9 General Fund/Game & Fish Fund M Multiple Funding Sources 	<p>TRANSPORTATION</p> <ul style="list-style-type: none"> Two-Track and Seasonal Roads Highways Residential Roads Railroads Paved Airports Unpaved Airports County Roads <p>UTILITY</p> <ul style="list-style-type: none"> Pipelines and Transmission Lines Electric Transmission Lines <p>POLITICAL</p> <ul style="list-style-type: none"> Township Boundaries Great Lakes Shoreline County Boundary Section Lines <p>HYDROLOGY</p> <ul style="list-style-type: none"> Lakes and Ponds Rivers and Streams Drains and Intermittent Streams 	<p>DNR OWNERSHIP</p> <ul style="list-style-type: none"> Surface Mineral and Surface Minerals Mixed Ownership Other Rights <p>40.00 Acres of Surface Ownership 40.00 Acres of Mineral and Surface Ownership 40.00 Acres of Mineral Ownership</p> <p>MAP INFORMATION</p> <p>DNR Land Ownership and Fund Source information is derived weekly from the MDNR's Land Ownership Database. Parcel information is compiled to the quarter-quarter section level.</p> <p>COMPLETENESS AND QUALITY The data does not reflect planned parcels, Private Claims, or parcels within the City of Detroit and/or Saint Clair County Plats.</p> <p>The amount of acreage owned within a quarter-quarter section is identified by acreage labels in the upper right corner of each quarter-quarter section.</p> <p>The quality and completeness of this data is unknown. It is suggested that this data be combine with a second source, such as plat maps, to further identify ownership.</p> <p>The information displayed on this map is intended for general planning purposes only. Specific ownership or funding source information should be verified by contacting the MDNR.</p> <p style="text-align: right;"> MICHIGAN DEPARTMENT OF NATURAL RESOURCES Forest, Mineral and Fire Management</p> <p style="text-align: right;">DATE: 02/28/2006</p>
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Private In-Holdings

There are a large number of private in-holdings within HRA. These include:

- Vector Pipeline Compressor Station on Duck Lake Road (19 acres),
- Hi-Mill Manufacturing Company on M-59 (5.25 acres),
- Individual single family parcels scattered about the Recreation Area (approximately 30 parcels totaling 200 acres).

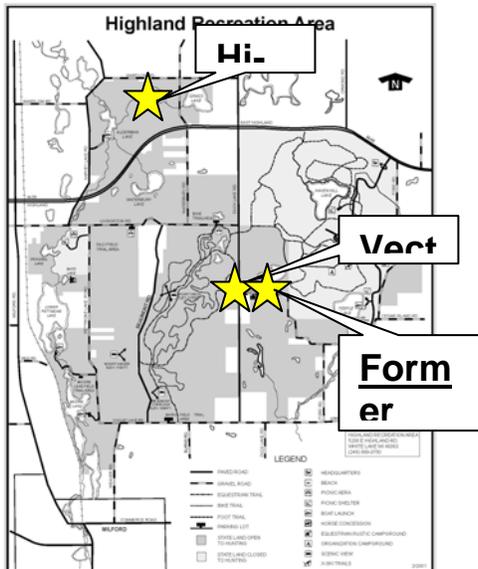
In addition, Highland Township owns a 20-acre parcel on Duck Lake Road that was purchased from the State of Michigan in 2000 for use as a compost site. The parcel is surrounded by state land on the north, east and west, and is located near the southern boundary of the HRA. This facility was closed in 2005/06 and was offered for resale to the State. The State has not chosen to exercise its right to purchase the parcel and the Township has no current plans for its use.

This fragmented patchwork of private/public ownership impacts the availability of state lands for hunting, since State law places limits on how near one may hunt in proximity to residential or other occupied properties.

Vector Pipeline Compressor Station
2282 S. Duck Lake Rd
19 acres



Vector Pipeline Compressor Station
 2282 S. Duck Lake Rd
 19 acres



Hi-Mill Manufacturing
 1704 E. Highland Rd
 5.25 acres



Former Compost Site
S. Duck Lake Road
20.0 acres



Management of Adjacent Lands

RESIDENTIAL

HRA neighbors mostly residential land and some limited commercial property along M-59. One issue regarding residential neighbors is the use of state park land for private purposes. Often, residents create their own paths within the park leading to their own lot, or encroach on state land through their mowing and lawn maintenance activities.

HIGHLAND TOWNSHIP/WHITE LAKE TOWNSHIP

Highland Township and the Highland Equestrian Conservancy have expressed an interest in establishing an equestrian ‘theme’ for the Highland CBD, located just west of the Recreation Area, and have also expressed interest in making and expanding equestrian facilities in Highland RA.

Highland and White Lake Townships are also working with Oakland County on a Green Infrastructure Plan that would include open space and trail linkages to the HRA. The County-wide Green Infrastructure Plan includes a potential trail connection from the South at Cooley Lake Road in Milford Township, and safety paths along M-59, which would border the park in several areas. Additionally, White Lake Township is seeking grant funding to develop a multi-use (including equestrian) trail connection from Highland RA to Pontiac Lake RA.

Land use patterns for properties adjacent to the recreation area in Highland Township are well established, with few vacant properties abutting the park.

In White Lake Township, properties along the north side of M-59 at the northeast corner of the recreation area are planned for a mixed use commercial project that could feature 300,000 square feet of retail space, including two or three “big box” stores, live-work units and multiple family housing. The developer is exploring the potential for creating a pedestrian overpass that would provide cross access between the development and the south side of M-59, which would include Highland Recreation Area.

MICHIGAN LAND USE LEADERSHIP COUNCIL

In 2003, Governor Granholm formed the Michigan Land Use Leadership Council to study and make recommendations about land use in Michigan. The council’s report makes several recommendations that affect HRA. It recommends protection of headwater areas, incentives to build trailways, supplements to the Michigan Natural Resource Trust Fund, and several other recommendations regarding natural resource industries, including forestry, agriculture, mining, and tourism.⁴

⁴ Michigan Land Use Leadership Council. *Final Report of the Michigan Land Use Leadership Council*. 2003

RELATIONSHIP OF HRA TO OTHER PARK RESOURCES

Highland Recreation Area is situated in an area near abundant park land. This section describes those park lands that are located within this region, including state, regional, and county parks.

State Parks and Recreation Areas

There are approximately 19 state parks and recreation areas totaling approximately 78,765 acres within a 60 mile radius of Highland Recreation Area. In Oakland County, there are approximately 31,000 acres of state park land.

State Parks and Recreation Areas within 60 Miles of HRA

Park	Type	County	Acres
Sleepy Hollow	State Park	Clinton	2,678
Waterloo	State Recreation Area	Jackson, Washtenaw	20,500
Metamora-Hadley	State Recreation Area	Lapeer	723
Island Lake	State Recreation Area	Livingston	4,000
Brighton	State Recreation Area	Livingston	4,947
Pinckney	State Recreation Area	Livingston, Washtenaw	11,000
Wetzel	State Recreation Area	Macomb	900
Sterling	State Park	Monroe	1,000
Bloomer	State Park 4	Oakland	28
Dodge No. 4	State Park	Oakland	139
Maybury	State Park	Oakland	944
Proud Lake	State Recreation Area	Oakland	4,700
Holly	State Recreation Area	Oakland	7,817
Seven Lakes	State Park	Oakland	1,434
Bald Mountain	State Recreation Area	Oakland	4,637
Ortonville Recreation Area	State Recreation Area	Oakland	5,400
Pontiac Lake State Rec. Area	State Recreation Area	Oakland	3,700
Lakeport	State Park	St. Clair	565
Algonac	State Park	St. Clair	1,450
TOTAL			78,765

Oakland County Parks

There are 11 major parks within Oakland County. There are also 54 golf courses. These parks offer multiple recreational opportunities such as golf, tennis, athletic fields, picnicking, mountain biking, and a water park.

Oakland County Parks

Park	Type	Municipality	Acres
Addison Oaks	multi-use	Addison Township	794
Glen Oaks	golf	Farmington Hills	N.A.
Groveland Oaks	multi-use	Holly Township	360
Independence Oaks	multi-use	Clarkston	1,088
Lyon Oaks	multi-use, golf	Lyon Township	1,024
Orion Oaks	multi-use	Orion Township	27
Red Oaks	water park	Madison Heights	N.A.
Rose Oaks	undeveloped	Rose Township	620
Springfield Oaks	golf	Davisburg	N.A.
Waterford Oaks	multi-use	Waterford Township	145
White Lake Oaks	golf	White Lake Township	N.A.

Oakland County has completed purchase of additional acreage in Highland Township, approximately 1.5 miles north of the HRA. The park is comprised of approximately 250 acres used for fairly passive recreation, such as trail riding and hiking. A limited amount of bow hunting will be permitted, whereas use of firearms is prohibited. The Oakland County Parks and Recreation Department will be working on a master development plan for this park in the coming years.

Huron-Clinton Metropolitan Authority (HCMA) Parks

There are also 13 Metro Parks in the southeast Michigan region, totaling 23,844 acres. They are managed by the Huron-Clinton Metropolitan Authority, which is funded by a tax paid for by residents of the five-county metro Detroit area, including Wayne, Oakland, Macomb, Washtenaw, and Livingston Counties. These parks contain many natural areas, but offer multiple recreational opportunities such as mountain biking, athletic fields, boating, fishing, golfing, and horseback riding. There is no camping or hunting allowed in Metro Parks.

Huron-Clinton Metro Parks

Name	Acres	Name	Acres
Delhi	53	Lower Huron	1258
Dexter-Huron	122	Metro Beach	770
Hudson Mills	1,549	Oakwoods	1,756
Huron Meadows	1,540	Stoney Creek	4,461
Indian Springs	2,215	Willow	1,531
Kensington	4,357	Wolcott Mill	2,625
Lake Erie	1,607		
		Total	23,844

NATURAL RESOURCES

ENVIRONMENTAL PROTECTION

HRA contains wildlife and natural areas that need to be protected. The Haven Hill Natural Area is comprised of approximately 721 acres located south of M-59 and west of Ford Road, is designated as a National Natural Landmark and is further protected as an NRC designated and legally dedicated Natural Area.

The Haven Hill Natural Area has all of southern Michigan's principal forest types within one small area, including swamp forest of tamarack, cedar, beech-maple forest, oak-hickory forest, and mixed hardwood forest. Haven Hill Lake, although created through the Ford family impoundment of a local creek, provides a high quality water resource restricted to non-motorized activities. The area has remained largely undisturbed for the past 75 years and has retained its natural character as well as some unusual flora and fauna.



There are also several listed species, as determined by Michigan Natural Features Inventory (MNFI).

MICHIGAN NATURAL FEATURES INVENTORY

Michigan Natural Features Inventory (MNFI) is an effort by Michigan Department of Natural Resources and Michigan State University Extension to survey and inventory significant natural features in state parks and recreation areas.⁵ MNFI reports provide the majority of information on natural features within this report.

⁵ Michigan Natural Features Inventory. <http://web4.msue.msu.edu/mnfi/>

MNFI reports frequently point out the *Endangered* (E) and *Threatened* (T) plant species of Michigan, which are protected under the Endangered Species Act of the State of Michigan (Part 365 of PA 451, 1994 Michigan Natural Resources and Environmental Protection Act). Also included in many MNFI reports are plant species of *Special Concern* (SC). While not afforded legal protection under the Act, many of these species are of concern because of declining or relict populations in the state. Should these species continue to decline, they would be recommended for *Threatened* or *Endangered* status. Protection of *Special Concern* species now, before they reach dangerously low population levels, would prevent the need to list them in the future by maintaining adequate numbers of self-sustaining populations within Michigan. Some other potentially rare species are listed as of *Special Concern* pending more precise information on their status in the state; when such information becomes available, they could be moved to threatened or endangered status or deleted from the list.

In addition, MNFI reports detail the *Endangered* (E), *Threatened* (T), and *Probably Extirpated* (X) animal species of Michigan, which are protected under the Endangered Species Act of the State of Michigan (Part 365 of PA 451, 1994 Michigan Natural Resources and Environmental Protection Act). As with plant species, included in this list are animal species of *Special Concern* (SC), which are afforded special attention.

MNFI most recently conducted field surveys at HRA from 1996 through 2000 and published a report of its findings and management recommendations in March, 2001.

Natural Community Inventories

As one element of the MNFI field inventories, ground surveys were conducted to identify the types of natural communities occurring within the HRA. Natural communities are areas characterized by distinct combinations of topography, soils, hydrology, vegetation and wildlife. Eight significant natural communities were identified, including those listed below.



- southern wet meadow
- mesic sand prairie
- relict conifer swamp
- southern swamp
- hardwood – conifer swamp
- dry-mesic southern forest
- mesic southern forest
- prairie fen

photo source: MNFI Staff

PLANT LIFE

There are a wide variety of plant types present throughout the HRA, consistent with what might be expected given the many landforms and ecosystems. A number of rare or unique plants were spotted during the MNFI field surveys, including those listed below.



Photo Source: <http://www.fs.fed.us/ipnf/eco/yourforest/wildflowers/twinflower.html>

Listed Plant Species that May be at Highland Recreation Area

Scientific Name	Common Name	Status
<i>Jeffersonia diphylla</i>	twinflower	SC
<i>Hydrastis canadensis</i>	goldenseal	T
<i>Angelica venenosa</i>	hairy angelica	SC
<i>Panax quinquefolius</i>	ginseng	T
<i>Castanea dentata</i>	American chestnut	E
<i>Galearis spectabilis</i>	showy orchis	T

Status: E – State listed Endangered, T - State listed Threatened, SC - Special Concern

WILDLIFE

Rabbits, squirrel, grouse, woodcock, ducks, geese, raccoon and deer are common in the park. Also, a variety of amphibians such as turtles and frogs are found there. Possum, skunk, fox, coyote, bats, mink, muskrat, wild turkey, hawks, owls, and a variety of migratory songbirds are seen there too.



Listed Animal Species that May be at Highland Recreation Area

Scientific Name	Common Name	Status
<i>Emydoidea blandingii</i>	Blanding's turtle	SC
<i>Dendroica cerulea</i>	cerulean warbler	SC
<i>Accipter cooperii</i>	Cooper's hawk	SC
<i>Sistrurus catenatus catenatus</i>	eastern massasagua	SC
<i>Wilsonia citrina</i>	hooded warbler	SC
<i>Seiurus monticella</i>	Louisiana waterthrush	SC

Source: MNFI

Status: E – State listed Endangered, T - State listed Threatened, SC - Special Concern

No rare or endangered snakes or invertebrates were documented during the MNFI field survey efforts. Prairie warbler (E), tamarack tree cricket (SC) and red-legged spittlebug (SC) were all documented at HRA in 2003, after the MNFI report was published.

VEGETATION

Much of Highland Recreation Area has been modified due to logging, agriculture, and recreational development. Much of the original pre-settlement vegetation pattern was black oak barren, with areas of mixed oak forest on the south and pockets of mixed conifer swamp and wet prairie as well.⁶

An oak barrens community is characterized by widely scattered and clumped oak trees and shrubs in a matrix of prairie grasses and forbs, which is often referred to as a savanna. Typically, small pockets of black oak and white oak are prevalent, with some northern pin oak and hickories. Grasses and forbs include big and little bluestem and Pennsylvania sedge, with a variety of forbs present.

Wet prairies were historically found in many depressions of the oak barrens. Wet prairies are characterized by grasses such as blue-joint, cordgrass, Indian grass and big bluestem, as well as sedges and prairie forbs. These plants tolerate dry summer conditions as well as wet conditions. Wet prairies are considered a very rare ecosystem globally and imperiled in Michigan.

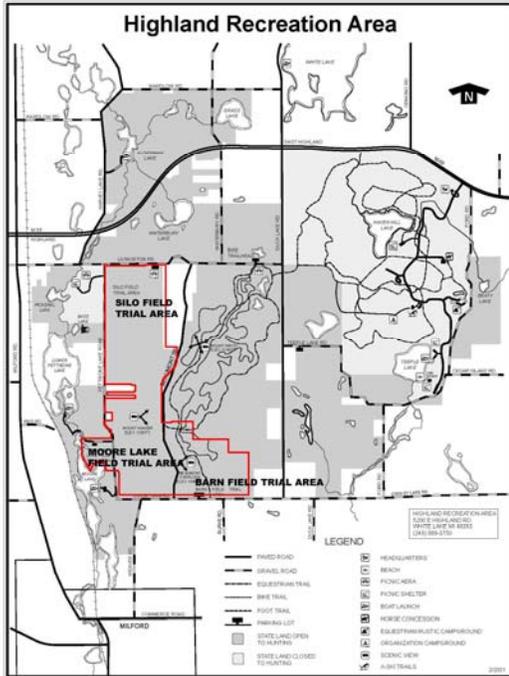
Mixed conifer swamps are essentially forested wetlands in peat and muck soils. Typical tree species include tamarack, white cedar, white elm, basswood, red maple, black ash, yellow birch and white pine. Dense shrub groupings include spicebush, leatherwood, highbush blueberry and poison sumac. In bog areas, a thick carpet of sphagnum moss can be found.

When parcels comprising the park were acquired beginning in the 1940's, much of the land had been cultivated for crops, for sheep grazing, or as orchards. Early aerial photos (see appendix) show a typical patchwork pattern of farmed fields and fence rows, interrupted by tree cover primarily in wetlands areas and by waterbodies. After the state acquired the farmland, it was essentially left to revegetate with non-native invasive grasses and shrubs. Large areas of second-growth oak forest also emerged.

Wetlands and swamp ecosystems were also disrupted, largely due to the influence of manmade dams at Lower Pettibone Lake, Moore Lake, and Haven Hill Lake; as well as through road building and other construction

⁶ MNFI Inventory and Management Recommendations for Highland State Recreation Areas's Natural Communities, Rare Plants and Rare Wildlife, March 19, 2001

activities. Much of the tamarack population is gone. The Haven Hill wetlands and forest complex is still considered to be a high-quality natural ecosystem, although diversity of vegetation is threatened by invasive species.



The DNRE is actively working through the State Park Stewardship Unit (SPSU) with the Highland Field Trial Grounds Association (HFTGA) to restore a sustainable, functioning, high quality oak barrens ecosystem to the 929 acres of the recreation area known as the Highland Field Trial Area (Silo North, Silo South, Barn and Moore Lake). This effort is guided by a Stewardship Management Plan prepared in January 2000, and revised April 2001.⁷ Stewardship activities have included invasive species removal, planned burns and mowing, seeding with native prairie plant seeds, and seed collection and propagation for future plantings.

INVASIVE SPECIES

Invasive species have affected HRA. The Federal Executive Order on Invasive Species defines an invasive species as "an alien species (plant, animal, insect, bacteria, and fungi) whose introduction does or is likely to cause economic or environmental harm or harm to human health". In turn, an alien species is defined with respect to a particular ecosystem and is considered any species "that is not native to that ecosystem" (Executive Order 13112, 1999). Alien species are also known as exotic, non-native, or introduced, however the term alien also applies to native species outside their natural range or ecological boundaries. The terms noxious, nuisance, or invasive characterize alien species when these organisms cause harm.⁸



Emerald Ash Borer (EAB)⁹ is an exotic, aggressive beetle that has already been responsible for the death of approximately 15 million of Michigan's 700 million ash trees since it was discovered in 2002. All of the

⁹ and Field Trial Area, Fahlsing, et.al, Jan., 2000. y.msu.edu/Mipc/aboutInvasive.htm otosmore.html

counties of southeast Michigan fall within the state's quarantine area. There is to be no movement of wood out of these counties. Also, it has been necessary in some cases to eradicate ash trees to prevent a large outbreak of EAB. The EAB is found in HRA as evidenced by dead and dying ash trees in the park. Its destructive impacts will have future implications at HRA.

Purple Loosestrife¹⁰ is another invasive species that can be found throughout Oakland County wetlands. Purple loosestrife (*Lythrum salicaria*) is a perennial plant native to Europe and Asia which has become widely established in the US and Canada. It grows and reproduces prolifically in wetlands and other moist habitats. Each mature 4-7 foot tall plant produces 30 or more beautiful purple flower spikes that bloom in late summer and can produce over 2.5 million seeds per year. Once it becomes established, purple loosestrife frequently becomes the dominant vegetation by out-competing native plants. As native plant communities are reduced, so too are wildlife species that depend on them. Declines in ducks, geese and other wetland birds as well as muskrats, mink and some amphibians have all been noted. There is also concern that purple loosestrife may reduce spawning habitat for some fish. Recently, there have been successful attempts to eradicate purple loosestrife with the release of three species of plant feeding beetles, *Galerucella californiensis*, *Galerucella pusilla* and *Hylobius transversovittatus*.



Garlic mustard¹¹ is an exotic invasive plant from Europe that invades woodland habitats in North America and impacts forest biodiversity. In some woodlands, dense stands of garlic mustard in the spring threaten showy spring blooming ephemerals like spring beauty, trilliums and trout lilies. Other research points toward potentially negative impacts on timber species and forest health. Many land managers consider it to be one of the most potentially harmful and difficult to control invasive plants in the region. It readily invades forested habitats where it can displace native plants, compete with timber species regeneration, alter soil composition and structure, impact natural associations between plants and fungi, and result in cascading ecosystem impacts.

¹⁰ Photo Source: <http://www.stockpix.com/stock/nature/botany/2517.jpg>

¹¹ Photo Source: http://www.uwgb.edu/biodiversity/herbarium/invasive_species/allpet_leaves01first_year.jpg



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The Gypsy moth is another invasive species affecting the entire state. It can be found throughout both peninsulas. Michigan Department of Agriculture have been following a policy of containment of the Gypsy Moth. During high population levels, total defoliation can occur. During the months of June and July, defoliating populations cover sidewalks, homes, children’s play equipment and other objects making outdoor activity in residential and recreational areas almost impossible. Existence of Gypsy moths may mean expense and pesticide use to eliminate egg masses from plant material slated to go into areas without gypsy moth.



Figure 2. *Sirex noctilio*—adult male.

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The United States Department of Agriculture is becoming increasingly concerned about the threat posed by the exotic Sirex woodwasp. This insect is native to Europe, Asia and northern Africa, and was introduced to the United States with wood packing materials in port areas. The female wasp attacks living pines by injecting the tree with a fungus, and laying her eggs. Together, the larvae and fungus act to kill the tree. Infected trees change color from dark green to yellow to red, while retaining their needles. The pest can be managed using a parasitic worm, injected into infected trees. The USDA has approached Highland Township to begin a monitoring program to detect and manage the pest if they emerge as a threat to the area.

¹² Photo Source: <http://www.wmnh.com/ptiab07a.jpg>

¹³ Photo Source: http://www.na.fs.fed.us/spfo/pubs/pest_al/sirex_woodwasp/sirex_woodwasp.htm



14

Phragmites is a reed that spreads aggressively through a wetland community, disturbing the natural ecosystem. It is characterized by a dense root mat that blocks other plants from growing, water from flowing freely, and birds and animals from feeding. The plants quickly take over trails and boardwalks, growing laterally through its root mat as well as through seed dispersion. The plants grow tall with an impressive seed head. When the plants die off, the decaying reeds create a mucky sludge, adding unwanted nutrients to the wetlands. The only effective means of control is through the careful use of chemical herbicides.

Oriental bittersweet is an invasive exotic that closely resembles the native plant which is becoming less and less common. Both varieties are popular additions to floral displays. Bittersweet is a deciduous woody perennial, which grows as climbing vines and trailing shrubs. Female plants produce clusters of small greenish flowers that yield three-valved yellow capsules that split open at maturity to reveal the red orange fruits which contain one or two seeds. Male plants do not



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produce the fruits. American bittersweet produces larger fruits, whereas the Oriental bittersweet produces larger quantities of smaller fruits. The aggressive spreading Oriental bittersweet takes over other vegetation, blocking out sunlight and smothering trees under its weight.

¹⁴ Photo Source: Paul Curtis, MDNR 9/07

¹⁵ Photo source: <http://www.nps.gov/plants/alien/fact/ceor1.htm>



¹⁶

Black or Louis swallow-wort (pictured above) and pale swallow-wort (pictured below) are aggressive, twining perennials that grow in extensive patches and easily overtake old-field habitats, crowding out goldenrod and grasses and destroying the vegetation and habitat that many grassland birds and butterflies rely on. These plants are part of the milkweed family and resemble other native plants such as the honeyvine.



Glossy or common buckthorn are non-native woody shrubs that can grow to 20 feet in height. Glossy buckthorn typically invades wetlands including swamps, bogs, fens and wet meadows but also occurs in upland habitats such as woodland edges, old fields and roadsides. Common buckthorn is primarily an invader of upland sites including open woods, woodland edges, prairies and open fields. Both species are capable of growing in full sun as well as heavily shaded areas. They produce abundant flowers and seeds, spread and form thickets which leaf out early in the season and shade out native species.



¹⁷

¹⁶ Photo source: <http://www.nps.gov/plants/alien/fact/cyro1.htm> and <http://www.nps.gov/plants/alien/fact/cylo1.htm>

¹⁷ Robert H. Mohlenbrock @ USDA-NRCS PLANTS Database / USDA SCS. 1989. *Midwest wetland flora: Field office illustrated guide to plant species*. Midwest National Technical Center, Lincoln.



Autumn Olive is drought tolerant shrub that thrives in a variety of soil and moisture conditions. Since it is so adaptable, it has invaded grasslands, fields, open woodlands and disturbed areas. It threatens native ecosystems by out-competing and displacing native plant species.

AQUATIC RESOURCES

There are several lakes within HRA, as well as numerous wetlands including the Highland Havens wetlands complex. The HRA is at the headwaters of the Kent Lake Subwatershed of the Upper Huron River.

Named Lakes within Highland Recreation Area

Name	Location	Size (acres)
Alderman Lake	Highland Twp. Sec. 14/23	15
Grass Lake	Highland Twp. Sec. 13	33
Waterbury Lake	Highland Twp. Sec. 23	31
Pickerel Lake	Highland Twp. Sec. 27	9
Bass Lake	Highland Twp. Sec. 27	3
Lower Pettibone Lake	Highland Twp. Sec. 27/34	100
Moore Lake	Highland Twp. Sec. 34	83
Haven Hill Lake	White Lake Twp. Sec.	51
Teeple Lake	White Lake Twp. Sec.	49
Beaty Lake	White Lake Twp. Sec.	3

Huron River

The headwaters of the Kent Lake subwatershed of the Upper Huron River lie within the Highland Recreation Area. There are two significant local watersheds. Approximately 1/4 of the park is tributary to Pettibone Creek, which flows south from Upper Pettibone Lake, through Alderman Lake, Pickerel Lake, Lower Pettibone Lake and Moore Lake and through a series of other unnamed lakes before flowing into Kent Lake. The remainder of the park is better characterized as several wetland complexes, with a series of

¹⁸ Photo source: James H. Miller, USDA Forest Service
http://www.invasivespeciesinfo.gov/plants/autmnolive_child.shtml

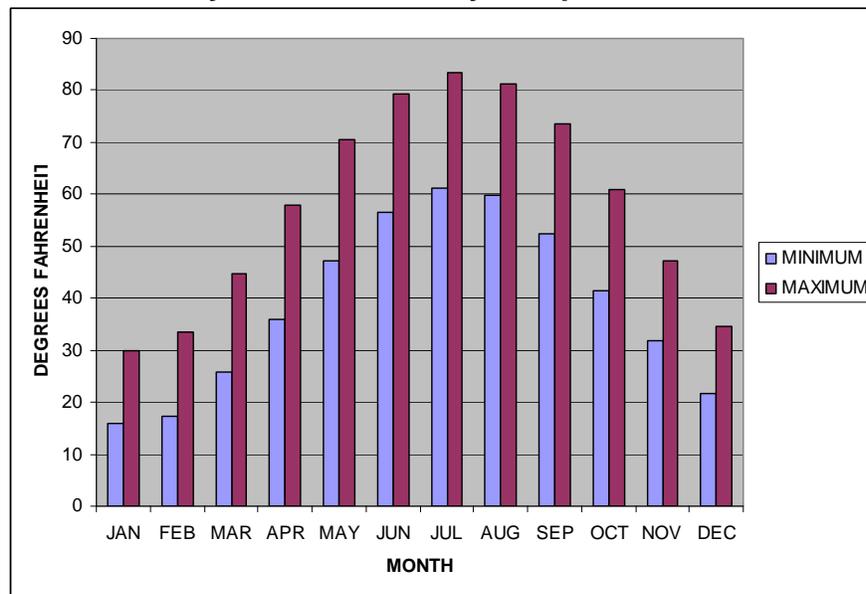
small waterbodies, wetlands and vernal pools that may or may not be interconnected.

The Haven Hill wetlands complex is of national significance, and has earned several national landmark designations as discussed previously.

CLIMATE

Highland Recreation Area in Oakland County has cold winters and warm summers, typical of southeast Michigan. In January, the average minimum and maximum temperatures are 15 and 30 degrees Fahrenheit. In July, the average minimum and maximum temperatures are 61 and 84 degrees Fahrenheit. Oakland County gets 29 inches of rainfall and 35 inches of snowfall annually. The county has a 163 day growing season. Also, it has an average of 11 days above 90 degrees and 7 days below 0 degrees Fahrenheit.¹⁹

28-Year Summary of Mean Monthly Temperatures for Pontiac, MI



Source: Michigan State's Climatologist's Office

¹⁹ Michigan Economic Development Corporation. <http://www.medc.michigan.org>

Climate Summary of Oakland County

MONTH	AVG. MIN TEMP	AVG. MAX TEMP.
January	15F./-9C.	30F./-1C.
July	61F./16C	84F./29C.
PRECIPITATION	RAINFALL	SNOWFALL
Average Annual	29in./74cm.	35in./89cm.
GROWING SEASON	DAYS ABOVE 90F/32C	DAYS BELOW 0F/-18C
163	11	7

Source: NOAA Climate Summary, 1995

GEOLOGY AND TOPOGRAPHY

Within the park, the topography is typified by rolling hills, with elevations that vary from approximately 1150 feet at Mount Kanzer (just west of Beaumont Road) to 946 feet above sea level at Teeple Lake (southern end of the park). The park includes a ridge of very steep hills (including Mount Kanzer, Mount Omich and the Beaumont Overlook) running from the north to south along the center of the park. The former Ford estate was situated to take advantage of the sweeping views of the surrounding land.

Highland Recreation Area consists mainly of *glacial outwash*, *ice-contact terrain*, and *end moraines*, as evidenced in the steep slopes and extensive low wet areas throughout the park.

SOILS

Soils throughout the park vary considerably. Soils are predominantly loamy sands, except within wetlands areas, where more hydric soils types are prevalent.

The majority of the land area is mapped as the Oshtemo soils series, which includes well drained soils on outwash plains, beach ridges and moraines, with sandy and loamy material in underlying sand and gravelly sand; and Spinks soils series, which includes well drained, moderately rapidly permeable soils on outwash plains and moraines, formed in sandy material. Both soils series are found in slope ranges varying from 0 to 35 percent.²⁰

Wetlands areas in the park are primarily found in the Houghton soils series, which consists of very poorly drained, moderately slowly to moderately rapidly permeable soils in bogs or depressions on moraines, till plains, or outwash

²⁰ *Soil Survey of Oakland County Michigan*, United States Department of Agriculture, March 1982.

plains, formed in organic sediments. The soils are found in slope ranges varying from 0 to 1 percent.

There are pockets of other soils types as well, and the predominant soils types are mixed with others in typical associations (such as Oshtemo-Boyer loamy sands or Houghton-Adrian-Napolean mucks). The soil characteristics generally impact issues such as the suitability for onsite sewage disposal, structural design, and erosion potential.

FLOODPLAINS

A floodplain is an area adjoining a lake, stream, river, or pond that receives excess water from occurrences such as rainstorms. A floodplain exists where flooding occurs with frequency and predictability based on natural topography and proximity to a body of water. The areas affected by floodplains are those areas that immediately surround the many lakes and Pettibone Creek.

GROUNDWATER

Highland and White Lake Townships rely on systems of wells to provide municipal water supplies, and individual wells for individual homeowners not served by the townships. There are 18 community well fields and over 4,000 individual wells. Most of the area has high or moderate soil permeability. Therefore, it has high groundwater vulnerability. Within HRA, most of the park has high groundwater vulnerability with a small amount having moderate vulnerability. In addition, both Highland and White Lake Township have identified wellhead protection areas, although none of the delineated areas encompass lands in HRA. HRA has wells located in its modern campground.

WATERSHEDS

A watershed is the land that catches rain or snow and drains or seeps into a common marsh, stream, river, lake, or groundwater. The headwaters of five major drainage areas begin in Oakland County—the Clinton, Huron, Rouge, Flint, and Shiawassee. HRA falls within the Huron River Watershed. Development around HRA matters to the resources within the park. For



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Lower Pettibone Lake

example, stormwater runoff from M-59 and the commercial areas along the north end of HRA may result in silt, salt and other contaminants being introduced into the Huron Watershed.

In 1997, six communities in northwestern Oakland County collaborated on the Shiawassee and Huron Headwaters Resource Preservation Project (S&H Project).²² Under increasing demand for residential and recreational development, these municipalities contracted the Michigan Natural Features Inventory to conduct an inventory of the area and identify significant natural areas. None of the sites within HRA were selected for a full inventory, although an MNFI survey was completed later in 2001. Many of the recommendations and tools identified in the S&H Project are applicable within the HRA and apply to surrounding lands.

In 2001-02, the participants in the S&H Project banded with other communities and the Huron River Watershed Council (HRWC) to undertake a planning process to create a Kent Lake Subwatershed Management Plan (TMDL plan) to address the mandated Total Maximum Daily Load of phosphorus in Kent Lake. This plan offers strategies to reduce phosphorus loading, such as the installation of structural improvements, which do not necessarily impact the operations of the HRA at this time, and public education plans. The HRA can play a vital role in raising public awareness of water quality issues and this could be an important education/interpretation opportunity in the park.

The Steering Committee for the TMDL planning efforts continued on to address a broader range of water quality issues through a voluntary watershed based approach to the mandated Phase II National Pollutant Discharge Elimination System (Ph II NPDES) Stormwater permit. Thirteen communities, Oakland County, Southeast Michigan Council of Governments (SEMCOG), the Huron Valley School District, Huron-Clinton Metropark Authority, and HRWC all participated in the planning process. Many of the strategies outlined in that plan (published in 2005) deal with raising public awareness of water quality issues through enhancing visitor interaction with the watershed. Again, the HRA can play a vital role, particularly given the national significance of the Haven Hill complex.²³

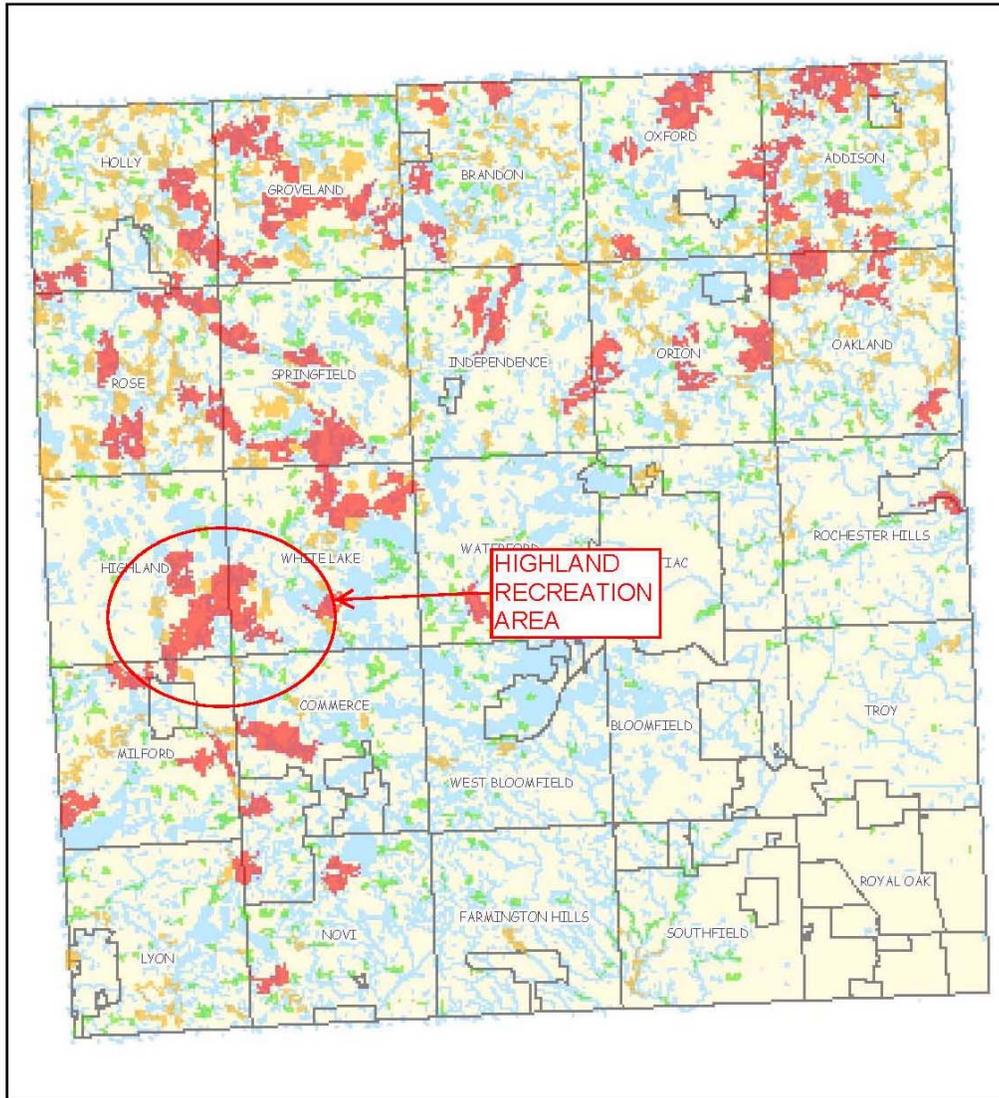
WETLANDS

The term *wetlands* refers to a variety of wet environments, inland marshes, wet meadows, mudflats, ponds, bogs, bottomland hardwood forests, and wooded swamps. There is a significant amount of wetlands at HRA. These include open water, scrub/shrub, emergent growth, and forested. Wetlands provide flood control, wildlife habitat, filtration of potential contamination of local aquifers, and aesthetic beauty.

POTENTIAL NATURAL AREAS

The term *potential natural area* is not to be confused with the legal term *dedicated Natural Area*, as described in Part 351, Wilderness and Natural Areas, of the Natural Resources and Environmental Protection Act of 1994, which gives land special legal protection. Instead, a potential natural area is a term used by MNFI to define places that are dominated by native vegetation and that have a high level of potential for harboring natural areas and unique natural features. MNFI uses a process to rank these areas based on the area's total size, size of its core area, the absence or presence of a stream corridor, its landscape connectivity, the restorability of surrounding lands, the quality of the vegetation, parcel fragmentation, and the number of element occurrences. MNFI uses these criteria to establish three levels of priority for *potential natural areas*—Priority One, Two, and Three.²⁴ Many acres of HRA fall within Priority One and Two categories, including the areas mentioned in the S&H Project: the Haven Hill Complex, the Waterbury Lake Complex, the Pettibone Lake Complex and the Alderman Lake Complex.

MAP OF POTENTIAL CONSERVATION/NATURAL AREAS



 	<h3>Oakland County 2004 Potential Conservation/Natural Areas</h3>	<p>Conservation/Natural Areas</p> <ul style="list-style-type: none">  Priority One  Priority Two  Priority Three  Lakes & Rivers <p>0 1 2 3 4 Miles</p> 
<p>Planning & Economic Development Services Executive Office Building 1200 N. Telegraph Road Department 612 Pontiac, MI 48341-0412 TEL: 248.868.0720 FAX: 248.075.9655 www.co.oakland.mi.us</p>	<p>Environmental Stewardship Program </p> <p>Planning & Economic Development Services</p> <p>Map Created: April, 2004</p>	

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HISTORIC/CULTURAL RESOURCES

ARCHAEOLOGICAL RESOURCES

As of 1980, Oakland County had 246 archaeological sites recorded, including several in White Lake Township. These sites range from the earliest Paleo-Indian period, through the Archaic, Woodland and Historic periods.²⁶ The majority of artifacts found in Oakland County come from the Archaic period and occur along the interface between the glacial lake bottom in Southeast Oakland County and the hilly upland glacial moraines and till plains to the northwest. HRA falls within this interface. Future discovery is possible. Also, metal detecting is permitted in certain areas of the park. Any items found must be reviewed by park staff and may be retained for further archeological investigation.

HRA may potentially have areas of archaeological significance since it is near the headwaters of the Huron River, it is on the site of several glacial moraines, has a lot of undeveloped land, and it is close to the Detroit area.

BUILDINGS AND STRUCTURES²⁷

There are a variety of structures and remnants of structure of historic interest within the park.

Edsel Ford Estate

Much of the park was acquired from the Edsel Ford Estate. There are a variety of unique structures within the park that were originally constructed by the Fords as a retreat from urban life. Most of the buildings require substantial restoration efforts due to changing use trends and vandalism.

The *Gate House* was located at the entry to the Ford property. It was originally the residence of Edsel Ford's farm superintendent, and then later was occupied by the manager of Highland Recreation Area. The exterior is wood shingled. There is a unique weathervane on top of the garage. The garage and house are connected by a roofed walkway. This structure has been badly vandalized and is no longer in use.

The *Ford Lodge* was constructed between 1924 and 1926. It was built with cedar logs reportedly transported from Ford Company's timber holdings in the Upper Peninsula, wrapped in burlap and sawed into half logs on the property. The lodge included five fireplaces and chimneys made of Vermont stone. The wrought iron hardware was handmade in the Upper Peninsula.

An adjacent garage (*Annex*) was constructed of similar materials to the garage. It housed family cars during the Ford era and served as a residence for the chauffeur.

The Lodge was converted to a conference center from 1949 until 1963, when legislators responded to criticism that the State was catering to wealthy interests, at the expense of the public and closed the Lodge to future rentals. The Lodge Annex was used as an Environmental Education Center in the 70's.

The Lodge was rented to a film crew in the 1990's as location for a horror film. The film crew damaged the Lodge and surrounding areas, and left without restoring the damage that was caused.

In 1999, the Lodge was lost to fire. The perpetrators were later caught and prosecuted. All that stands today are the fireplaces, stone steps, and foundation.

There are also remnants of a *kidney shaped swimming pool*, a *wading pool* and the foundations of a *bathhouse*. There are also the remnants of a *clay tennis court* made of clay imported from France.

The annex still stands, but is vacant and has been vandalized. Staff made the effort to wire peeling bark back to the underlying logs in the 90's, which appears to have preserved the integrity of the log structure.

There is a *pump house* built in the side of the hill at the Lodge which still contains a Model T engine used to power the pumps during power outages. Water was drawn from a well 318 feet below the surface by a turbine pump, and stored under pressure in two 9000 gallon tanks. The pump house is in excellent condition.

The *Farm Group Buildings* included buildings which housed thoroughbred riding and jumping horses and milk cows. The unit also included the residence for a stableman, a milk room and a tack room. A riding ring for Edsel's children was located east of the Farm Group Buildings. These buildings were converted to a workshop area for use of the park staff.



The *Sheep Barn* is a unique structure which originally housed 1500 sheep. Edsel Ford disposed of the sheep, since they were prone to disease, and used the barn to store feed for cattle and horses. At one time, the Sheep Barn was used as an area warehouse by the Department of Natural Resources. The exterior is finished with wood shingles. The Sheep Barn is no longer used. The roof is collapsing and many windows are missing. In 2007, the Friends of Highland Recreation Area was organized, with an initial mission of stabilizing the barn. The roof was secured for the winter season, but then was partially destroyed by high speed straight line winds that Spring. The group intends to pursue significant fundraising and undertake additional restoration projects in hopes that the barn can be opened for future public purposes.



Haven Hill Dam was constructed in 1926, creating a 62-acre impoundment by damming Cedar Creek. The dam is in acceptable condition, and is inspected regularly under the dam safety inspection program.



Dodge 10 Park

The *Caretaker's House* was built in the mid 1920's. It is built with a stone foundation and wood siding. The bungalow was renovated between 1933-34 by the CCC. The house was used as a residence of a park employee for many years. It is now vacant and in need of renovation.



The *Caretaker's Garage/Office* was built by the CCC. Its exterior is wood sided, and has double-wide wooden garage doors. It is currently vacant, and needs repairs to the roof.



The *Combination Shelter* is a stone and hewn wood structure also built by the CCC in the late 1930's. There is now a dropped ceiling, which hides the original wood rafters. The shelter is in good repair, with a working kitchen and bathrooms. It is rented for picnics.



There is also a waist high cast iron stove with the embossed letters of "Michigan State Parks."

The state still rents a *Rustic Cabin* on Pettibone Lake Road to the public. The cabin is constructed on a concrete block foundation. Its exterior is sided with small half logs placed vertically. Inside, the walls are covered with knotty pine siding. It has two bedrooms, a sleeping balcony, a living-dining room and small kitchen. The concrete basement includes a full bathroom, added by the DNR.

There is also an outdoor stove at the cabin, constructed of stone and cement. Two small stone wings flank the stove.

Other sites of interest include:

- The Alderman Lake Dam, constructed in 1952
- An empty house with aluminum siding at 1010 Livingston Road
- An empty house with aluminum siding and several outbuildings at 2284 Livingston Road
- A vacant house on Duck Lake Road

EDUCATION AND INTERPRETATION

The MDNR operated the Haven Hill Nature Center at the site of the Edsel Ford estate from 1973 through the 1980's. Currently, the DNRE does not operate interpretative or educational programs within the HRA. The Nature Center has fallen into disrepair and has been subject to vandalism.

RECREATIONAL RESOURCES

DEVELOPED OPPORTUNITIES

Day Use Areas

There are a variety of day use areas within the HRA, including the following:

Teepie Lake: Swimming beach, boat launch, picnic shelter with restrooms, water, and hiking trails.



Moore Lake: Boat Launch



Lower Pettibone Lake: Boat Launch, fishing docks.



Dodge 10: Picnic shelter with kitchen, modern bathrooms, running water, ball field and open field game area. Also access to walking trails from abandoned horseman's camp and boat launch. A paved parking lot is available for use by users. A run-down caretakers cabin and garage are also located at the site.



Alderman Lake: Boat Launch, fishing docks.



Goose Meadow (Haven Hill Lake): Picnic Area with vault toilets, potable water, ball fields and a paved parking lot.



Camping

There are 25 rustic/equestrian campsites. The equestrian campground has vault toilets and pressurized water supply. There is also an organizational campground, which provides an open field area adjacent to Teeple Hill for the exclusive use of groups such as boy scouts, girl scouts, etc. Vault toilets are available.

At Bass Lake, a rustic cabin is available for rental for a small party. The cabin is accessible from a long private drive off Pettibone Lake Road. There is no boat launch at this site.

Hunting

Rabbits, squirrel, grouse, woodcock, ducks, geese, raccoon and deer may be hunted during their respective seasons within designated areas.

Fishing

Several lakes offer excellent fishing for bass, pike, and panfish.

Bridle Trails and Riding Stable

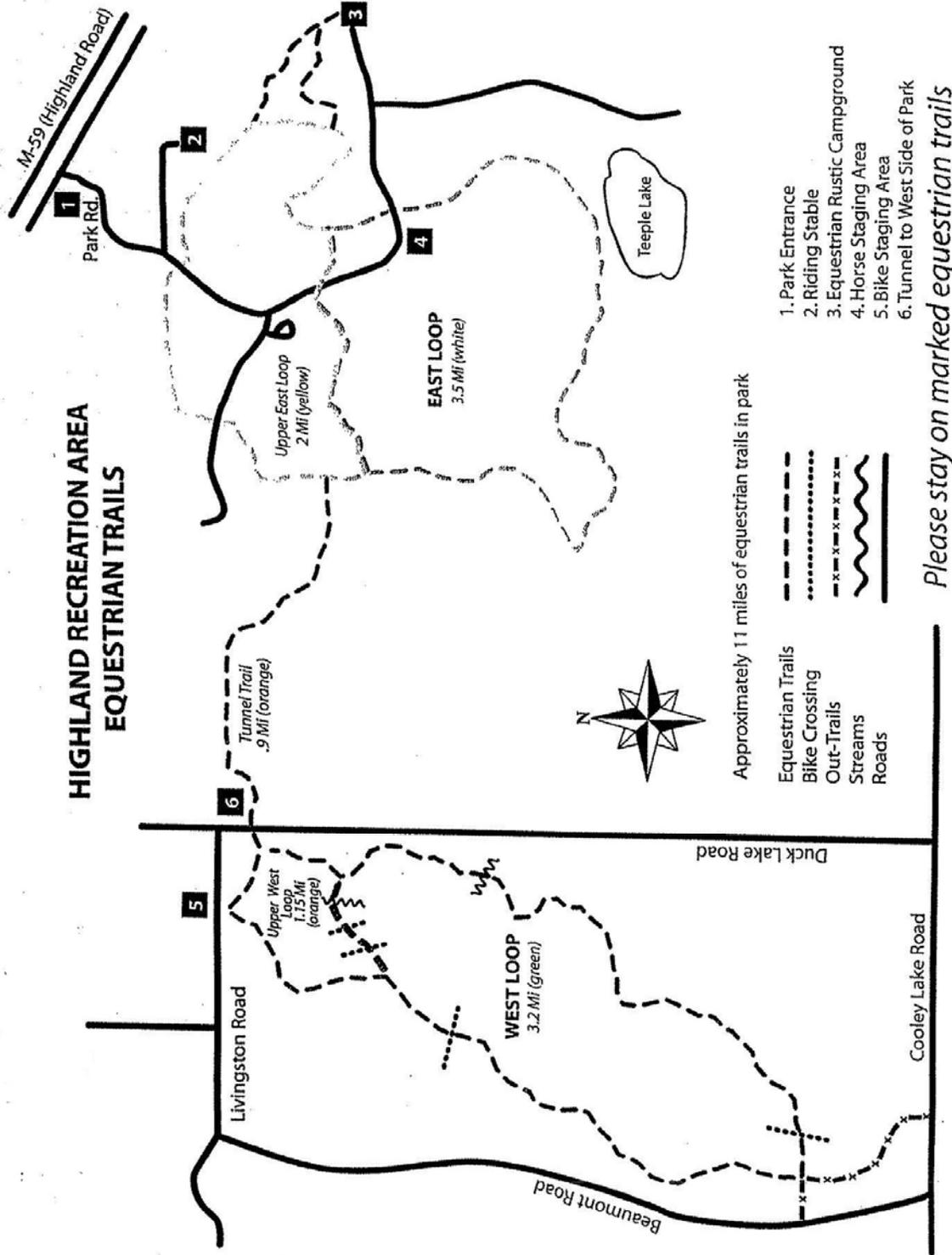
There are 12 miles of trails for use by equestrians. The Highland Trail Riders Association is an active partner in maintaining trails through their stewardship activities. The trails cross under Duck Lake Road in a culvert large enough to allow passage of a horse. Trailers may be parked at the Horse Stable off the main park road or at the horse staging area indicated on the map that follows.

The State of Michigan also leases a riding stable and equestrian concession stand within the park to a private individual who operates a business providing equestrian lessons and trail riding horses for hourly use to the public and providing boarding for privately owned horses. The facilities include a barn, pastures and trails. The operator provides food, riding accessories, sports wear and riding souvenirs to the public.



Trail Crossing under Duck Lake Road

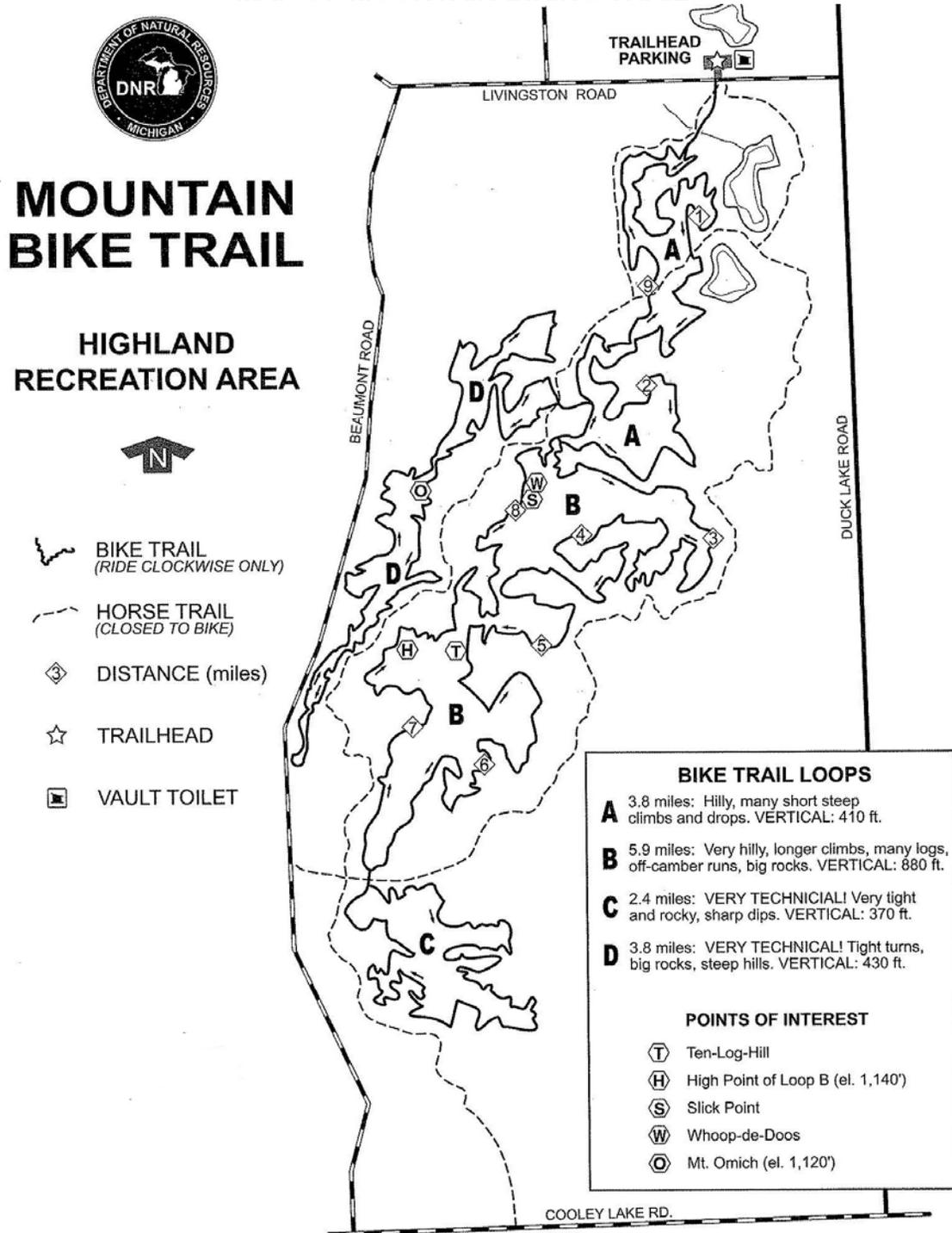
MAP OF HORSE TRAILS



Mountain Biking

There are 16 miles of mountain bike trail. Equestrian and mountain bike trails are separate to promote safety for all users.

MAP OF MOUNTAIN BIKING TRAILS



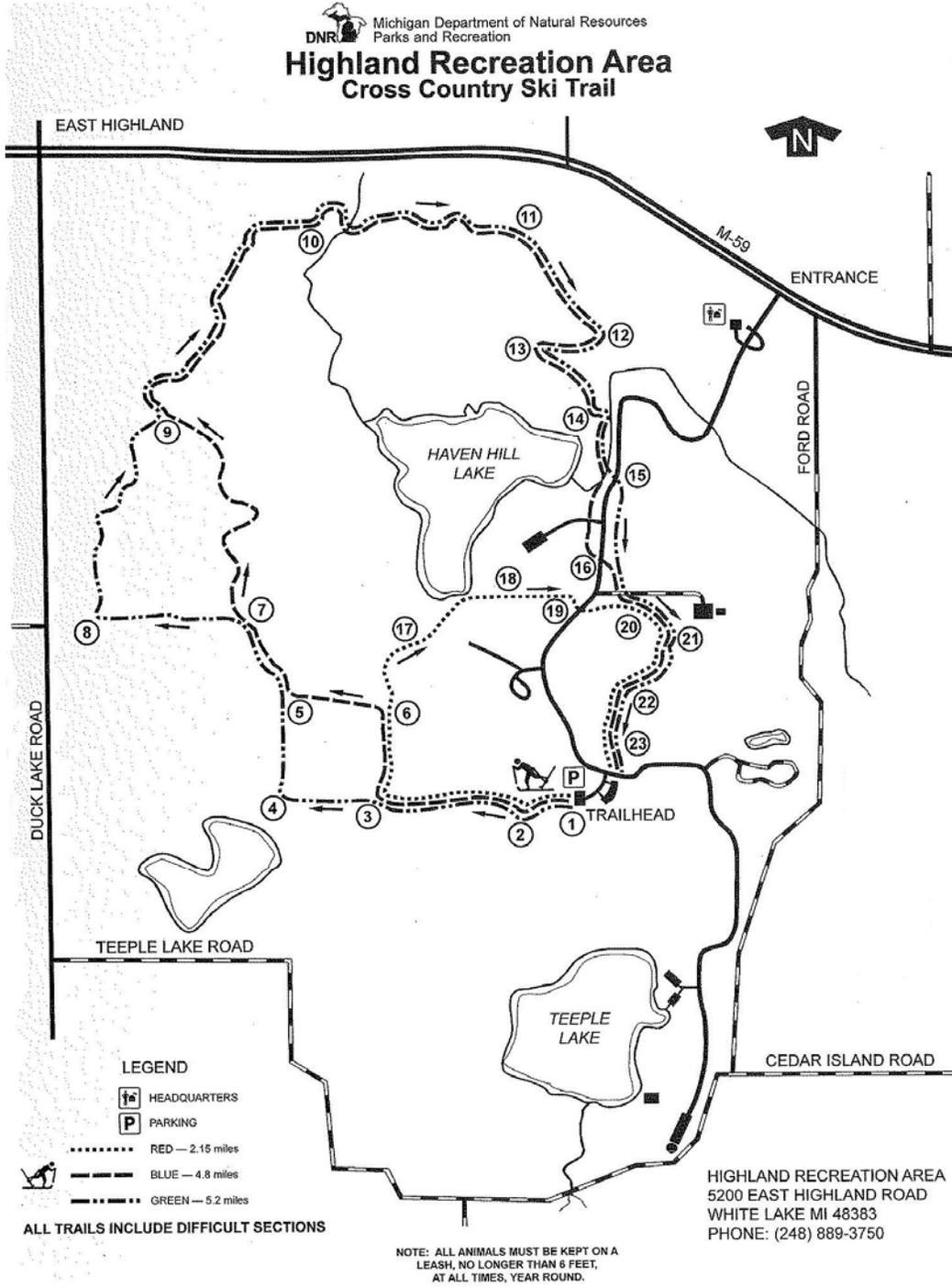
Hiking & Cross Country Skiing

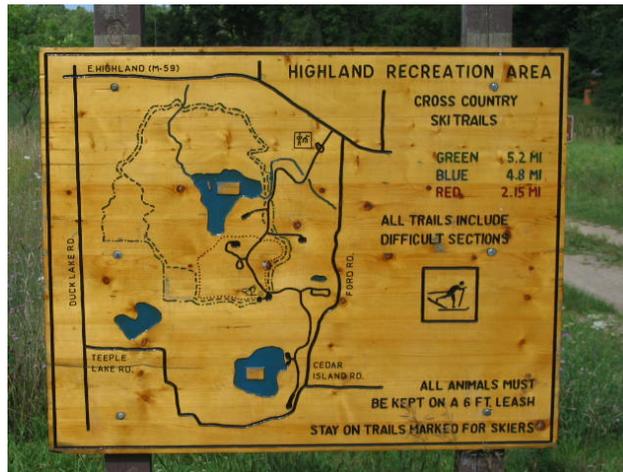
There are approximately 17 miles of hiking trails, including the Haven Hill Trail that crosses the Haven Hill Lake Dam and includes an extensive boardwalk across the wetlands. There are trailheads for foot trails at Goose Meadow and at the old Sheep Barn near Teeple Hill. The trailhead for skiers is located at Goose Meadow.

The Boy Scouts of America use a trailhead at the Organizational Camp as the beginning of the Chief Pontiac Trail, a 16.7 mile narrow foot trail that runs through Highland Recreation Area south to the Proud Lake Recreation Area and ending at Kensington Metro Park. Literally thousands of scouts have hiked the trail over the years, and have completed a written essay to earn their credential medal.



MAP OF CROSS COUNTRY SKI TRAILS





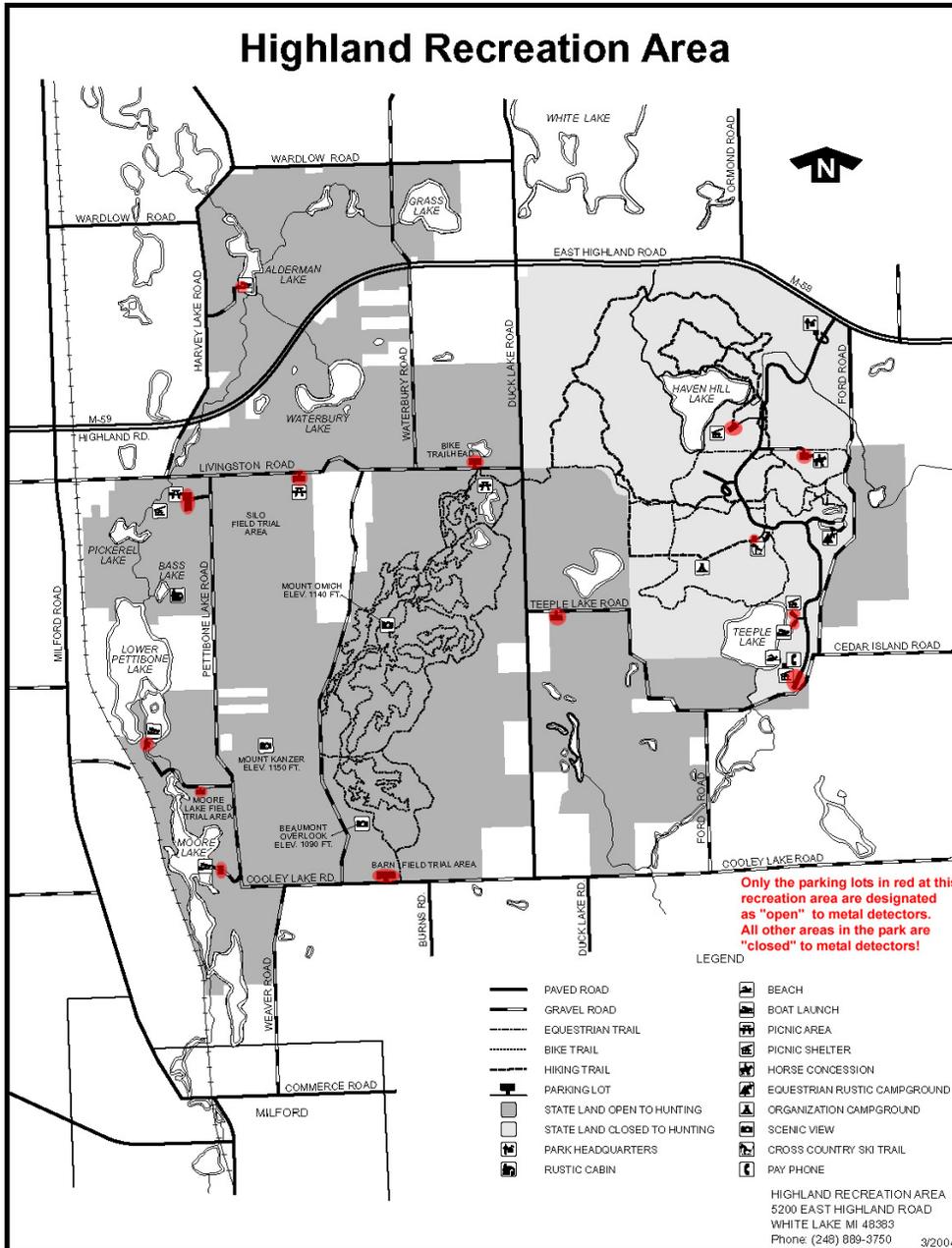
Snowmobiling

Snowmobiling is permitted in designated areas of the park, provided there is a base of snow four inches deep.

Metal Detecting

Metal detecting is recognized as a legitimate recreational activity when it is conducted in ways that do not damage the natural and cultural resources in Michigan State Parks, nor violate applicable state statutes. Metal detecting is allowed only in certain areas. Any items found must be reviewed by park staff and may be retained for further investigation.

AREAS WHERE METAL DETECTING IS ALLOWED



Radio-controlled Airplane Flying

The State of Michigan leases a building and gated area known as the “Flying Field” to the United Flying Organization (UFO) to provide a safe location for the flying of model aircraft. The members are granted a lease for non-exclusive access to this area for monetary consideration, subject to rules that dictate the hours of operation, flying season limitations, noise levels, and obligations for payment of utilities and telephone services and insurance. The site is accessed from Teeple Lake Road.

This location was the site of the now closed “Willard Landfill”. There are no active remediation efforts at this site, but it is presumed that environmental considerations may impact planning of any potential uses or development at this location.



Birdwatching

There is ample habitat for birds and other wildlife, especially forest-interior songbirds in the various oak forests and the Haven Hill Natural Area, wetland birds, and grassland-dependent birds at the field trial area. Bird watching is a popular activity in the park.

Field Dog Trials

Field dog trialing is a competitive sport where hunting dogs with their human partners, often on horseback, demonstrate their mastery of skills such as tracking, flushing and retrieving game birds. Rules and scoring systems are established for each breed. Field dog trials can be sanctioned by national organizations such as the American Kennel Club.

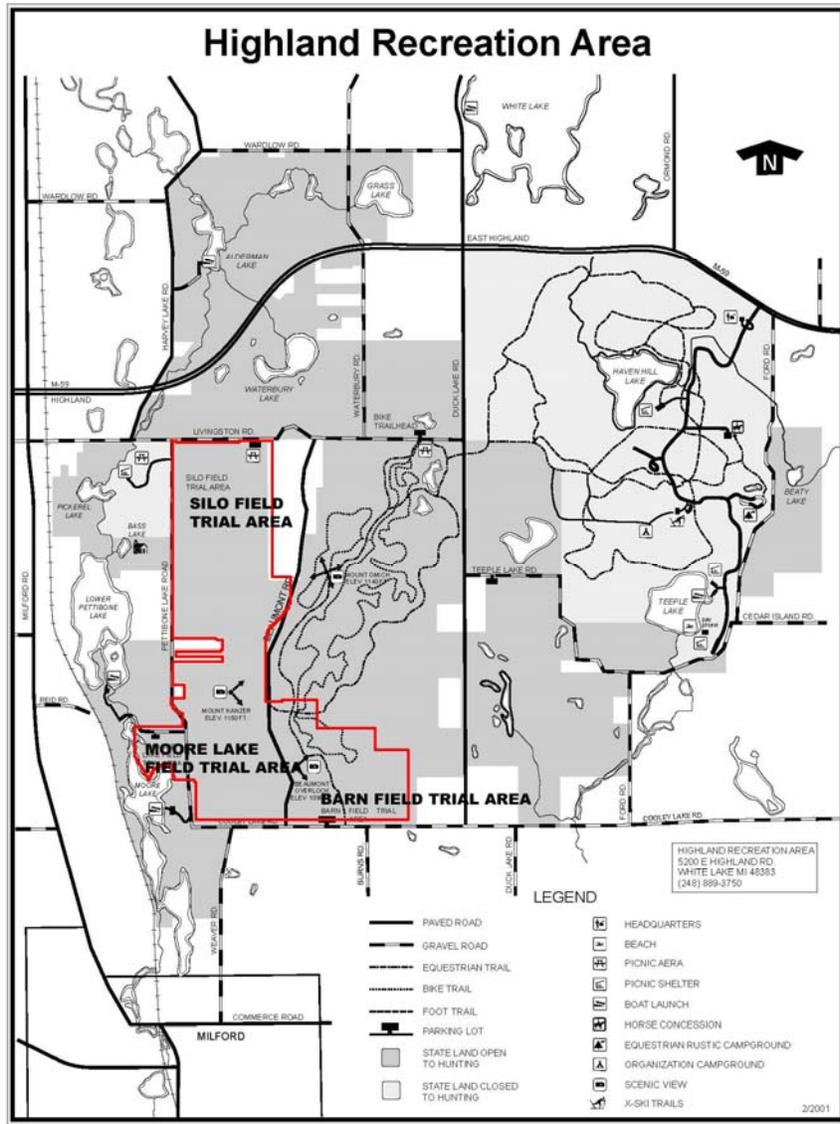
There are 929 acres designated as the Highland Field Trials Area (HFTA) by the Natural Resources Commission under the authority of Act 57 of the Public Acts of 1995 (section 324.42104 of the MCL) This land is dedicated for training, trialing and hunting with field dogs, and is under active stewardship

through agreement with user groups to restore native ecosystems and wildlife habitat. The area is used for dog training, hiking, hunting, and other general recreation.

The Highland Field Trial Grounds Association is an active user group representing 14 dog clubs that utilize the HFTA. In 2006, the group was awarded the “Partners in Conservation” award by the MDNR to honor the more than 2000 hours of volunteer work that the group has spent in clearing 9.5 acres of invasive species and planting 13 acres with native plants. Generally speaking, each of the 14 dog clubs is specifically dedicated to the promotion and betterment of a specific breed of hunting dog, but work cooperatively in the scheduling of training and competitive events at the site.

With 14 dog clubs, there are competitive events scheduled many weekends of the year, some drawing competitors from throughout the state and throughout the country.

MAP OF FIELD TRIAL AREA



AREAS OF CONFLICT

Trails

The major recreational issues faced by HRA involve trail use, hunting, ORVs, and snowmobiles. Largely through the stewardship activities of user groups, hiking, mountain bike, and equestrian trails have been realigned to satisfy each group. However, the popularity of trail-related recreation has future implications. There remains pressure on HRA to increase the number and configuration of trails. Trails, like other features of the built environment, are durable. They last a long time. Any change to trails can upset a dynamic balance in the ecosystem for a long time. Although user groups have worked to manage trails through volunteer efforts, the repercussions of increased trail density to habitat may be unknown and beyond the efforts of those engaged in trail maintenance. For further analysis of trail development see DNRE's *Southern Michigan Trails Program Management Plan*, completed in 2000.

Hunting

Hunting is one of the major uses of HRA, particularly in the Highland Field Trial Area. However, newer residents, who are often not as familiar with hunting, may object. Noise and perceived danger are part of the objection. Population growth and increased use of the park may increase conflicts among hunting and non-hunting groups. Parts of HRA were purchased with Pittman-Robertson funds and other 'Game Fund' sources, which were specifically intended to provide public hunting access.

ORVs

Off-road vehicles (ORVs) are prohibited within the Highland Field Trial Area and Haven Hill Natural Area. Due to the growth in population and close proximity of houses to the park, it is quite accessible to ORVs. There is some evidence of ORV use in areas throughout HRA. Any type of trail can be used by an ORV, which is often a four-wheeled "quad" or a two-wheeled "dirt bike." Any increase in trails may have the effect of increasing ORV use. Also, it is difficult to control ORV usage. HRA rangers patrol the park on foot or in trucks. ORVs can simply outrun or outmaneuver park rangers, due to their size and speed.

Snowmobiles

Snowmobiles are permitted in some areas of HRA, provided that there is a four inch base of snow. With the unpredictability of weather and the relatively moderate level of snowfall in Southeast Michigan, it is difficult to estimate the total number of days in a year in which snowmobilers can legally access the park. However, there is evidence of ruts and tracks left by riders who have not observed the four inch snow base limit. Like ORVs, snowmobiles are fast and highly maneuverable. Enforcement is difficult. They may also access areas and trails within the park that are not meant for their use.

Camping

This campground is a multi use campground that accommodates equestrian campers and others. Equestrian groups often complain that other campers do not understand or respect the needs of horses and their owners, creating excessive noise and violating the privacy of the horse owners by approaching the horses without permission. Consideration should be given to review and revision of rules, increased enforcement effort or providing a separate camping facility specifically for horses and their riders.

Beach Use

The beach has never been closed at HRA due to E. Coli. It is tested regularly by the Oakland County Health Department, in accordance with DEQ and EPA regulations. For specific information regarding the testing history of Teeple Lake from the Department of Environmental Quality, see <http://www.deq.state.mi.us/beach/public/default.aspx?County=63>.

LAND USE ORDERS OF THE DIRECTOR

There are legal requirements at all state recreation areas and state owned facilities that are classified as *land use orders of the director*. These specifically allow or restrict certain recreational uses and activities at the park.

By authority conferred on the Director of the Department of Natural Resources and Environment by Section 504 of Act No. 451 of the Public Acts of 1994, as amended, being section 324.504 of the Michigan Compiled Laws and in accordance with R 299.671 and R 299.922 of the Michigan Administrative Code, the Director of the Department of Natural Resources and Environment orders that the following order of the Land Use Orders of the Director shall read as follows:

Chapter V - State Parks and Recreation Areas

5.1 State parks and recreation areas, certain conduct prohibited.

5.1. A person shall not do any of the following in any state park or recreation area:

(1) Possess or use fireworks in a manner prohibited by section 243a of Act No. 328 of the Public Acts of 1931, being § 750.243a of the Michigan Compiled Laws.

(2) Have more than 1 horse for each registered camper at any designated horsemen's campground without first obtaining proper written permission from the department.

(3) Without first obtaining proper written permission, peddle or systematically solicit business of any nature; distribute handbills or other advertising matter; post signs on any lands, waters, structures or property; or use any portion of a state park or recreation area for commercial operations.

History: Iss. Sept. 17, 1993; Am. 10, 1995, Post Oct. 23, 1995.

Chapter VIII - Department Administered Lands and Facilities

8.2 State-owned lands, prohibited conduct, exceptions.

Order 8.2. A person shall not do any of the following upon state-owned lands administered by the department when the land is posted against such conduct except with written permission or when such conduct is performed as an official duty by a federal or state employee or local officer or member of an organized rescue or fire fighting force:

(1) Possess ash wood (*Fraxinus* spp.) upon any state lands unless that ash wood is without bark attached.

(2) Possess regulated deciduous cut firewood on state lands outside of a regulated area.

(3) A regulated area means those areas as defined by the emerald ash borer interior quarantine, published by Michigan Department of Agriculture under the authority of insect pests and plant diseases, 1945 PA 72.

History: Iss. Am. 1, 2005, Post May 6, 2005

Note that there are no specific additional requirements related to Highland Recreation Area, although there are certain prohibitions at state owned boat launches in the near vicinity that are administered by staff at HRA (White Lake access, site 63-6 and Tipsico Lake access, site 63-18)

PARK USE STATISTICS AND ECONOMIC IMPACTS

PARK USE

Highland RA, proximate to metropolitan Detroit, is located within a one hour drive of 42% of the population of Michigan. There were 243,040 recreational visits to HRA in 2005. Of those visits, 97 percent were to the day-use area, while the other 3 percent are attributed to camping. Total revenue for 2005 was \$132,804.

Characterization of park use is described as follows: (based on DNRE-Park Attendance Statistics for 2005)

- Summer Use Season – This is defined as the five month period of May through September. 90% of all camping and 62% of all day-use takes place during these months. 91% of cabin use takes place in this period.
- Fall Use Season – At Highland RA, the fall season is defined by the months of October through November. October is the highest use month of this season that accounts for 4% of all camping activity in the park. The same is true of day-use, with 12% of all day-use taking place primarily in October. During this season, cabin use is only 2%.
- Winter Use Season – December through February marks another decline in park camping activity, accounting for only 1% of camping use and no cabin use. Day-use activity is relatively strong, with 14% of day-use during this season.
- Spring Use Season – March through April shows increasing park use in camping and cabin use. Camping use is at 5%, day-use is at 12%, and cabin use is at 7%. In this season, use continually increases as the weather warms up. April is the busiest spring month for day-use.

From “MI CRS Statistics 2005“ report by Spherix (most recent report), the state contractor that administers the Campground Reservation System (CRS), Highland RA was the lowest ranking park in Michigan with 592 campground reservations in 2005. (Reflects the limited opportunity provided with only 25 campsites)

From the same source, the following statistics (2005 data) are attributable to Highland RA:

- Highland RA had gross revenues from camping in 2005 of only \$11,957.
- The average amount paid per reservation at Highland RA was \$25.17, well below the state average of \$66.49. The high in the state system was \$134.08 at Grand Haven SP on Lake Michigan, and the low was \$22.10 at Newaygo State Park.
- The average number of people per reservation was 3.9, well above the state average of 2.7, and the highest in the state.
- The average length of stay was 1.7 days, well below the state average of 2.5 days.

Camping

HRA has \$104,926 revenue from camping over the last five years.(2001-2005) and a total gross revenue for the park of \$632,017 for the same time period. While camping represents only 3% of total use, revenues generated by camping average 16.6% of the total for the park.

Economic Summary of Highland Recreation Area

Year	Total Reservations	Number of Visitors	Gross Revenue
2001			\$115,727
2002			\$112,990
2003			\$127,441
2004			\$143,055
2005			\$132,804

Source: MI CRS Statistics and PRD

Revenue: Park Improvement Fund

NAME of UNIT	2001	2002	2003	2004	2005	AVERAGE
HIGHLAND RECREATION AREA	\$115,727.00	\$112,990.65	\$127,441.50	\$143,055.57	\$132,804.70	\$126,403.88
SEVEN LAKES STATE PARK	\$150,862.88	\$189,856.37	\$174,632.68	\$230,077.90	\$245,694.28	\$198,224.82
PONTIAC LAKE RECREATION AREA	\$333,800.65	\$399,646.57	\$367,588.05	\$439,094.95	\$445,768.31	\$397,179.71
BRIGHTON RECREATION AREA	\$278,172.95	\$373,463.93	\$375,509.60	\$338,373.52	\$449,434.25	\$362,990.85
PROUD LAKE RECREATION AREA	\$333,441.93	\$383,686.28	\$313,545.66	\$405,329.94	\$355,906.95	\$358,382.15
STERLING STATE PARK	\$476,812.64	\$151,909.59	\$574,182.75	\$814,223.15	\$756,624.24	\$554,750.47
HOLLY RECREATION AREA	\$322,799.27	\$434,687.86	\$413,046.40	\$415,510.08	\$445,258.75	\$406,260.47
PINCKNEY RECREATION AREA	\$476,708.01	\$612,923.64	\$572,319.77	\$662,127.90	\$685,001.71	\$601,816.21
METAMORA HADLEY REC. AREA	\$302,947.09	\$448,482.75	\$435,566.00	\$437,857.44	\$532,937.00	\$431,558.06
LAKEPORT STATE PARK	\$369,200.56	\$589,129.39	\$624,071.25	\$682,678.20	\$555,936.62	\$564,203.20
ALGONAC STATE PARK	\$335,169.26	\$621,652.98	\$599,485.88	\$440,737.68	\$743,705.11	\$548,150.18
TOTAL	\$3,495,642.24	\$4,318,430.01	\$4,577,389.55	\$5,009,066.33	\$5,349,071.92	\$4,549,920.01

ECONOMIC IMPACTS

Michigan State University (Dr. Dan Stynes) developed an economic analysis model known as "[MGM2](#)". This model is an update of the MGM model developed by Dr. Ken Hornback for the National Park System in 1995. The purpose of the updated MGM2 model is to estimate the impact of park visitor spending on the local economy. These economic impacts are reflected in terms of sales, income, employment, and value added.

This analysis tool, like others, relies on three primary factors in the common equation:

Economic Impact of Tourism Spending = Number of Tourists (x)
Average Spending per Visitor (x) Multiplier (to estimate extended effects of direct spending).

For our purposes of conducting a very basic review of impacts, we have utilized the "MGM2-Short Form" version of the program, which simplifies the extent of analysis required for input, and utilizes more generalized multipliers for spending outputs. For the non-economist, this provides an excellent tool for establishing a baseline assessment of the economic impacts of our parks.

Economic impacts of Pontiac Lake State Recreation Area to the local community are substantial. Following are the relative economic impacts (based on 2005 data) of the park to the surrounding community.

Direct Economic Effects to the Community

- Direct spending attributable to HRA visitors totaled \$2,542,000 of which \$2,313,000 came from day-use, and \$229,000 came from camping.
- Jobs totaled 67, with 61 related to day-use activity and 6 to camping.
- Personal income total is \$882,000, with \$803,000 associated with day-use of the park and \$79,500 associated with camping
- Value added (total income plus business taxes) totaled \$1,337,000. Day-use accounted for \$1,217,000 and camping accounted for \$120,000.

Total Economic Effects to the Community

(NOTE...this reflects *Direct Effects* plus the *Secondary Effects* of visitor spending on the local economy. *Secondary Effects* (sometimes called *Multiplier Effects*) capture economic activity that results from the recirculation of money spent by the park visitors in the community.

- Total Spending = \$3,670,000 (44% over direct spending)
- Jobs = 84 (25% over direct job impacts)
- Personal Income = \$1,289,000 (46% over direct personal income)
- Value added = \$2,041,000 (53% over direct value added)

STAKEHOLDER INPUT

DNRE PROGRAMS

Highland RA maintains a relationship of cooperative management with other Department programs.

The Forest Management Division (FMD) administers prescribed burns at Highland RA. Ecologists evaluate possible sites and prepare an ecological prescription for FMD. The fires are coordinated and monitored by trained officers who follow a burn plan. The oak barrens restoration program associated with the Field Trial Courses is conducted by Stewardship and is dependent on fire to maintain the natural ecosystem.

Marketing, Education and Technology Division (METD) will play a vital role in partnership with the County and private sector partners to implement new interpretative programs envisioned for the former Ford Estate.

The Office of Land and Facilities (OLAF) is responsible for all land ownership records on DNRE land, as well as land transactions. OLAF is responsible for the purchase and disposition of parcels to consolidate state holdings within the park boundary.

The Land and Water Management Division (LMWD) is responsible for overseeing dam safety inspections.

The Water Bureau (WB) is responsible for overseeing public water and wastewater treatment/disposal for the campgrounds and day use areas.

The Law Division provides enforcement of state law and Natural Resource regulations on the park property.

LOCAL AGENCY PROGRAMS

There are several local agencies within the surrounding area that serve as stakeholders.

Local Fire Departments – Highland Township, White Lake Township and Milford Area Fire Departments each serve as first responders to various areas of the park. Ambulance services stage their services at the local stations.

Local Law Enforcing Agencies – The Oakland County Sheriff’s Department, White Lake Township Police Department and Milford Police Department enforce laws in and around the park within their respective jurisdictions. The Oakland County Sheriff’s Department maintains a substation just north of Livingston Road, near the west edge of the park.

Oakland County Planning and Economic Development Services (OCPEDS) – OCPEDS is involved in a variety of projects related to “New Economy” initiatives through placemaking, trail planning, and other green infrastructure programs. OCPEDS recognizes the significance and opportunities presented by the park and is an active and enthusiastic stakeholder. OCPEDS provided technical support for preparation of this plan.

Highland Township and the Highland Downtown Development Authority – Highland Township identifies the natural features and recreational opportunities present at Highland Recreation Area as one of the keystones to its “placemaking” efforts. Highland Township is interested in establishing its “Highland Station” area as a western gateway in the park and partnered with the Department in facilitating and preparing this plan.

Road Commission for Oakland County (RCOC) -- RCOC is responsible for maintaining a number of roads within and adjacent to the park.

OTHER STATE AGENCIES

Michigan Department of Transportation (MDOT) is responsible for maintaining M-59 (Highland Road), which passes through the park and delineates much of its northern boundary. The primary entrance to the park is from M-59.

PRIVATE SECTOR

All adjoining property owners are categorically a stakeholder. There are also a variety of local business interests in Highland Township, White Lake Township and the Village of Milford which are considered stakeholders. Park users don’t spend their money just at the park. A significant amount of commerce takes place at local stores and restaurants.

SPORTING CLUBS

Many clubs and associations are very active in the park.

Highland Trail Riders Association and Kensington Trail Riders Association – These groups have worked closely with park management to develop and maintain trails for equestrian use.

United Flying Organization – This group holds a non-exclusive lease to land in the southeast corner of the park and maintains facilities for the operation of remote control aircraft.

Highland Field Trial Grounds Association (HFTGA) – This group maintains the Field Trial Courses, coordinates and manages training events and competitions, and works closely with Stewardship to restore the oak barrens ecosystem at the Field Course areas. In 2006, the HFTGA was recognized with a “Partners in Conservation Award,” recognizing their donation of time, money, and construction of a picnic shelter. The group has blended its mission of preserving the sport of dog field trialing with conservation of biological diversity.

Michigan Mountain Biking Association (MMBA) – The Metro South Chapter of the MMBA organizes trail workdays at parks throughout southeast Michigan, including Highland RA. Their members use the park extensively.

SPECIAL INTERESTS

The following groups have an interest in the use of Highland RA.

Friends of Highland Recreation Area (FOHRA)—FOHRA was organized in 2007, and began work in earnest on raising funds and renovating the historic sheep barn. Despite the discouraging damage the barn sustained in a straight line wind storm, the group continues on its mission of rehabilitating the historic/cultural assets of the park and promoting the natural assets of the park. The group has entered a lease agreement with the DNRE to further their work in the park, and has worked to develop relationship with other special interest groups such as the Boy Scouts, Highland Equestrian Conservancy, Highland Conservancy, and numerous other local special interest groups.

Huron Valley School District (HVSD) – The school district utilizes the park for a variety of purposes: the summer latchkey program, outings to train students about watershed protection, and as training grounds for athletic teams such as cross-country, track, and equestrian.

PUBLIC

Many of the park visitors who come to Highland RA each year are repeat customers. This is true system wide, as has been documented in the 1997 “Michigan State Parks Study” by Public Policy Associates and has been observed by park staff. These “regular customers” have specific expectations and desires for the future management of the park.

PLANNING OVERVIEW

Meetings:

10/1/2008 Start-up meeting
04/14/2009 Planning Team Meeting
05/20/2009 Planning Team Meeting
08/25/2009 Stakeholder meeting
11/12/2009 Public input meeting

Plan Reviews:

(date) RD Section Chiefs
(date) RD Management Team
(date) SLP Ecoteam
(date) DNRE Statewide Council
(date) NRC – MSPAC

REFERENCES

- DNR State Park Stewardship Program
http://www.michigan.gov/dnr/0,1607,%207-153-30301_31154_32311-34686--,00.html
- Invasive Species information
<http://forestry.msu.edu/mipc/>
<http://www.invasivespecies.msu.edu/>
<http://www.wmnh.com/ptiab07a.jpg>
- Michigan Economic Development Corporation (economy, quality of life, demographics)
<http://www.michigan.org/index.asp>
- Michigan Land Use Leadership Council
<http://www.michiganlanduse.org/>
- Michigan Legislature Website
[http://www.legislature.mi.gov/\(tp01iyec3fiiv533ofm2t055\)/mileg.aspx?page=home](http://www.legislature.mi.gov/(tp01iyec3fiiv533ofm2t055)/mileg.aspx?page=home)
- Michigan Natural Features Inventory
<http://web4.msue.msu.edu/mnfi/>
- Money Generation Model, Version 2 (economic impacts)
<http://web4.canr.msu.edu/MGM2/default.htm>
- Oakland County
<http://www.oakgov.com/>
- National Park Service
<http://www.nps.gov/>
- Highland Recreation Area:
<http://www.michigandnr.com/parksandtrails/ParksandTrailsInfo.aspx?id=455>
- Shiawassee & Huron Headwaters Resource Preservation Project
http://www.cwaplan.com/project_pdf/naturalresources/Shiawassee%20&%20Huron%20Headwaters%20Resource%20Preservation%20Project%20.pdf
- State of Michigan Office of the State Archaeologist's Office

http://www.michigan.gov/hal/0,1607,7-160-17445_19273_19325-__,00.html

- Highland Township
<http://www.highlandtwp.com>
- White Lake Township Parks & Recreation Committee
<http://www.whitelaketwp.com/Departments/Park&Rec/parksandrec.htm>