

# 2002 Oakland County

## Potential Conservation/ Natural Areas Report



**Prepared by:**  
Michigan Natural Features Inventory

**Prepared for:**  
Oakland County Planning & Economic Development Services

# **Oakland County Potential Conservation/Natural Areas Report**

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**Prepared by:**

John Paskus, Associate Program Leader - Conservation  
Michael Penskar, Program Leader - Botany  
Helen Enander, Information Technologist I

Michigan Natural Features Inventory  
P.O. Box 30444  
8<sup>th</sup> Floor, Mason Bldg.  
Lansing, MI 48909-7944

MNFI maintains a continuously updated information base, the only comprehensive, single source of data on Michigan's endangered, threatened, or special concern plant and animal species, natural communities, and other natural features. MNFI has responsibility for inventorying and tracking the State's rarest species and exceptional examples of the whole array of natural communities. MNFI also provides information to resource managers for many types of permit applications regarding these elements of diversity.

**Prepared for:**

Oakland County Planning & Economic Development Services  
Daniel P. Hunter, Manager

L. Brooks Patterson, County Executive  
Dennis Toffolo, Director, Community & Economic Development Services

**For additional information contact Oakland County Planning & Economic Development Services at (248) 858-0720.**

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# Oakland County Potential Conservation/Natural Areas

## Introduction

Natural resource conservation is a fundamental component of a community's long-term environmental and economic health. Natural resource areas perform important natural functions such as water filtration and they provide recreational opportunities and wildlife habitat that enhance the overall vitality of a community. Abundant natural resources once surrounded population centers in Oakland County. Now, much reduced in size, natural resource areas are becoming encircled by population. These remaining sites are the foundation of Oakland County's natural heritage; they represent the last remaining remnants of Oakland County's native ecosystems, natural plant communities and scenic qualities. Consequently, it is in Oakland County's best interest and to a community's advantage that these sites be carefully integrated into the planning for future development. Striking a balance between development and natural resource conservation and preservation is critical if Oakland County is to maintain its unique natural heritage. This approach will provide the greatest opportunity to maintain high property values and continued market demand. Part of what makes Oakland County such a unique and desirable place to work, live, and play is the combination, quality, and accessibility of its natural landscapes, lakes, rivers, and streams.

Successful land use planning requires more than simply protecting small preserves and trusting that they will remain in their current condition indefinitely. Many human activities such as road construction, chemical and fertilizer application, fire suppression, and residential development can have a detrimental impact on populations of plants, animals, and insects and the natural communities in which they live. In order to maintain the integrity of the most fragile natural areas, a more holistic approach to resource conservation must be taken, an approach that looks beyond the borders of the site itself. What happens on adjacent farmland, in a nearby town, or upstream should be considered equally as important as what happens within a preserve. By looking to the past, understanding the present, and considering the future, it becomes apparent that a balance must be struck between development and natural resource preservation.

**This report identifies and ranks Potential Conservation Areas remaining in Oakland County.** Potential Conservation Areas are defined as places on the landscape dominated by native vegetation that have various levels of potential for harboring high quality natural areas and unique natural features. In addition these areas may provide critical ecological services such as maintaining water quality and quantity, soil development and stabilization, pollination of cropland, wildlife travel corridors, stopover sites for migratory birds, sources of genetic diversity, and floodwater retention. However, the actual ecological value of these areas can only be truly ascertained through on the ground biological surveys. The process established by the Michigan Natural Features Inventory (MNFI) of identifying potential conservation areas, can also be used to update and track the status of these remaining sites. The Michigan Natural Features Inventory recommends that Oakland County Planning & Economic Development Services Division (PEDS) incorporate this information into their

comprehensive natural area mapping services. The site map and ranking data can be used by local municipalities, land trusts, and other agencies to prioritize conservation efforts and assist in finding opportunities to establish an open space system of linked natural areas throughout Oakland County.

In this report the term “**potential natural area**” has been used in place of the term “**potential conservation area**”. The substitution was made in order to convey to the reader a clearer picture of the type of sites that are being delineated. It is felt that more people have a better understanding of the term “natural area”.

**The term “potential natural area”, however, 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.**

## History

In 1987 the foundation for preserving Oakland County’s natural heritage was put in place when the County contracted with the Michigan Natural Features Inventory (MNFI) to conduct the first inclusive natural area survey of Oakland County. This survey identified 37 sites of high natural quality and relatively undisturbed native vegetation. This survey proved useful in numerous preservation efforts in areas of acquisition, establishing conservation easements, and helping to guide the efforts of local land trusts. The survey’s limitation was in its ability to identify the larger ecosystems that maintain the long-term integrity of Oakland County’s highest quality natural areas. Subsequently, in the fall of 1997, six Oakland County municipalities (Rose, Springfield, Highland, Milford, White Lake Townships, and the Village of Milford) along with Oakland County Planning and Economic Development Services (PEDS) decided to undertake a more comprehensive study of natural areas. This new survey takes a more holistic approach to natural resource protection and is the foundation of the Shiawassee & Huron Headwaters Resource Preservation Project (S&H project). This project was a multi-jurisdictional, community based, public/private partnership, which demonstrates how to comprehensively identify and prioritize natural resources and critical ecosystems and identifies tools for the protection and sustainability of these resources. A systematic process was developed in order to identify and prioritize potential natural areas for preservation and/or further field survey efforts. This process was substantiated by the natural features data that the ecologists, botanists, and zoologists collected during field survey work performed at several of the S&H project identified sites.

In order to make comparable data available for the entire County, Oakland County PEDS contracted with the Michigan Natural Features Inventory (MNFI) in 2001 to complete the mapping and ranking of areas not included within the S&H project. Using a slightly refined process than was utilized during the S&H project, over 600 potential natural areas were identified and ranked. These sites represent what appears to be the least disturbed natural areas remaining within Oakland County.

When using this information it is important to keep in mind that site boundaries and ranking are a

starting point and tend to be somewhat general in nature. Consequently, each community, group or individual using this information should determine what additional expertise is needed in order to establish more exact boundaries and the most appropriate conservation efforts.

## **Process for delineating and ranking of Potential Conservation/Natural Areas within Oakland County**

### **Materials and Interpretation Methodology**

Interpretation of the 20-township area in Oakland County was conducted by using digital aerial photography taken in 2000 and provided by Oakland County's Planning and Economic Development Services Division. As the townships were methodically interpreted and digitized using this imagery, the same areas were examined using:

- 1:24,000 U.S. Geological Survey (USGS) 7.5 minute quadrangle maps,
- Michigan Resource Information System (MIRIS) 1978 digital landcover, and
- Southeast Michigan Council of Governments (SEMCOG) 1995 digital landcover.

These additional data sources were used to enhance and corroborate the interpretation process.

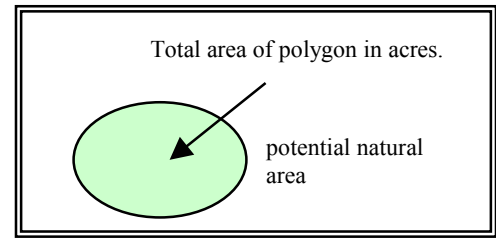
Delineation of sites was done through aerial photo interpretation, with emphasis placed on 1) intactness, 2) wetlands and wetland complexes, 3) riparian corridors, and 4) forested tracts. Delineation of sites during this phase of the process was done conservatively, such that the chance of capturing sites that may end up being eliminated upon closer inspection, was greater than the chance of omitting sites that should have been delineated. Sites were delineated by focusing on wetlands and forest tracts and eliminating as much development (including roads), active agriculture and old fields as possible. Boundaries typically were defined by hard edges such as roads, parking lots, developments, and railroad beds. All potential natural areas were identified and delineated regardless of size. Municipal boundaries were not utilized to delineate site boundaries unless the boundary corresponded to a defined hard edge, such as a road. Once all sites were delineated, sites under 20 acres were deleted.

### **Site Selection and Prioritization**

Following the aerial photo interpretation and the delineation of potential natural areas, a more rigorous level of examination was undertaken based upon specific scaled criteria to prioritize sites. Scaled criteria were developed that reflected the characteristics that were used to first delineate the sites. The criteria used to first delineate the sites were translated to a numerical scale. Each site could then be assessed based upon the scaled criteria and a total score calculated, based upon the sum of the scores for each criterion.

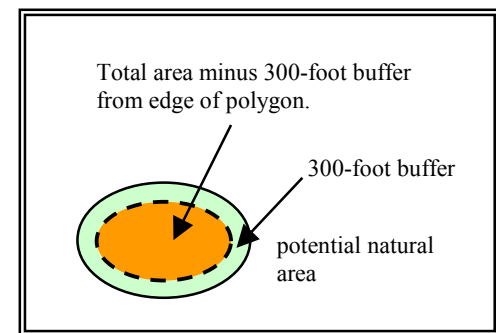
## Description of Criteria

**Size** - The total size of a site is recognized as an important factor for viability of species and ecosystem health. Larger sites tend to have higher species diversity, higher reproductive success, and improve the chances of plant and animal species surviving a catastrophic event such as a fire, tornado, ice storm, or flood.



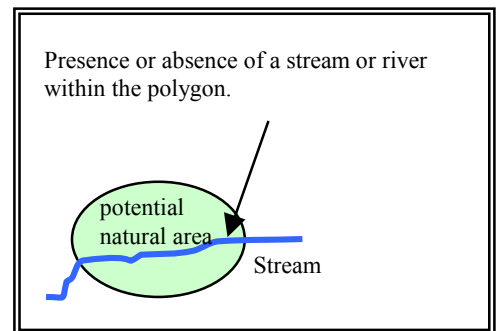
Size is defined as the total area of the polygon.

**Core Area** - Many studies have shown that there are negative impacts associated with the perimeter of a site on “edge-sensitive” animal species, particularly amphibians, reptiles, and forest and grassland songbirds. Buffers vary by species, community type, and location, however most studies recommend a buffer somewhere between 200 and 600 ft. to minimize negative impacts. Three hundred feet is considered a sufficient buffer for most “edge-sensitive” species in forested landscapes.



For this project, core area is defined as “size” (see above) minus a 300-foot wide buffer measured inward from the edge of the polygon. Core area is different from total area of the site because it takes into account the shape of the site. Typically, round shapes contain a larger core area relative to the total site than long narrow shapes.

**Stream Corridor** - Water is essential for life. Streams are also dynamic systems that interact with the surrounding terrestrial landscape creating new habitats. Waterways also provide the added benefit of a travel corridor for wildlife, connecting isolated patches of natural vegetation.



Sites that are part of riparian corridors were given a score of 2 or 0 points depending upon whether or not the site included a portion of a river or stream system. Oakland County GIS hydrography data layer was used to determine presence/absence of river or stream.

**Landscape Connectivity** - Connectivity between habitat patches is considered a critical factor for wildlife health. High connectivity improves gene flow between populations, allows species to recolonize unoccupied habitat, improves resilience of the ecosystem, and allows ecological processes, such as flooding, fire, and pollination to occur at a more natural rate and scale. Landscape connectivity was measured in two ways, *percentage* and *proximity*.

*Percentage*

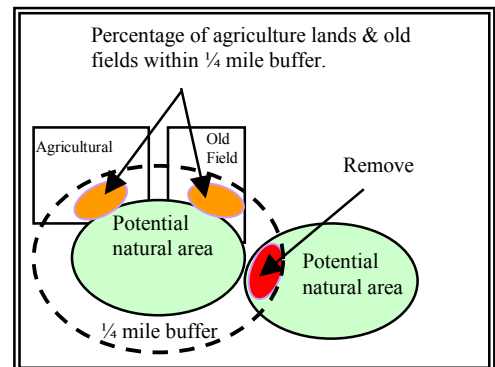
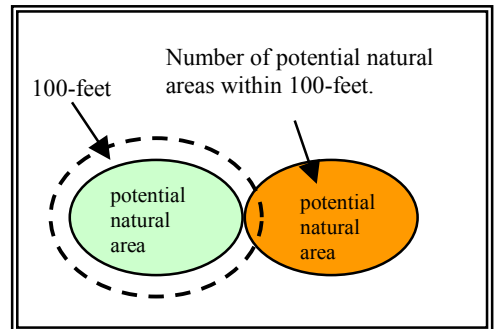
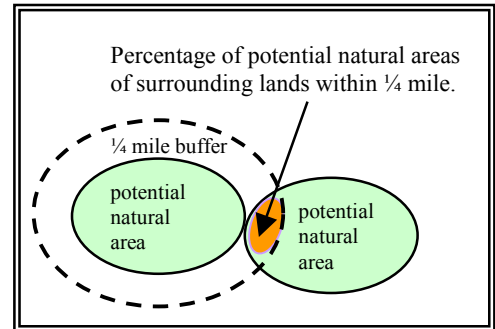
Landscape connectivity was measured by building a ¼ mile buffer around each polygon and measuring the percentage of area that falls within other potential natural areas.

*Proximity*

In addition to measuring the area around a polygon that is considered natural, connectivity can also be measured by the number of individual potential natural areas in close proximity to the site. The greater the number of polygons in “close proximity,” the higher the probability for good connectivity. Close proximity was determined to be 100 feet. One hundred feet was chosen as the threshold based on digitizing error and typical width of transportation right-of-ways, pipelines, and powerline corridors.

**Restorability** - Restorability is important for increasing the size of existing natural communities, providing linkages to other habitat patches, and providing a natural buffer from development and human activities.

Restorability is measured by the potential for restoration activities in areas adjacent to the delineated site. First, a ¼ mile buffer was built around each site. Potential natural areas as defined by MNFI, located within the buffer area were then removed, and the percentage of agricultural land and old fields within the remaining buffer area was measured. Only agricultural land and old fields were considered because they require the least amount of effort to restore back to some sort of natural condition. 1995 SEMCOG landcover data

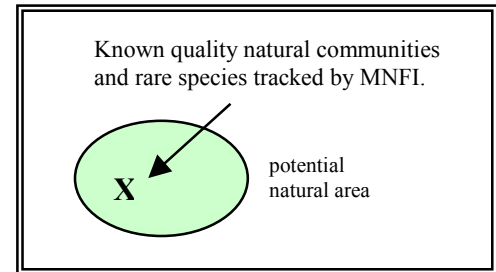


was used to identify areas of agricultural land and old fields.

**Element Occurrences** - The location of quality natural communities and rare species tracked by MNFI are often, although not always, indicative of the quality of a site. While not indicative of site quality, the occurrences in and of themselves are important.

Three points were awarded to sites that had three or more element occurrences (EOs), two points for 2 EOs, one point for 1 EO, and zero points if there were no EOs. Since Oakland County has never received a comprehensive natural features site field inventory, two total scores were calculated, one with element occurrence scores and one without. Excluding the element occurrence criteria from the matrix eliminates survey bias towards public lands and complications associated with the variability of the last observed date amongst element occurrences.

**Note:** The number of points assigned for each criteria is shown in the *site criteria table* located on page 10.



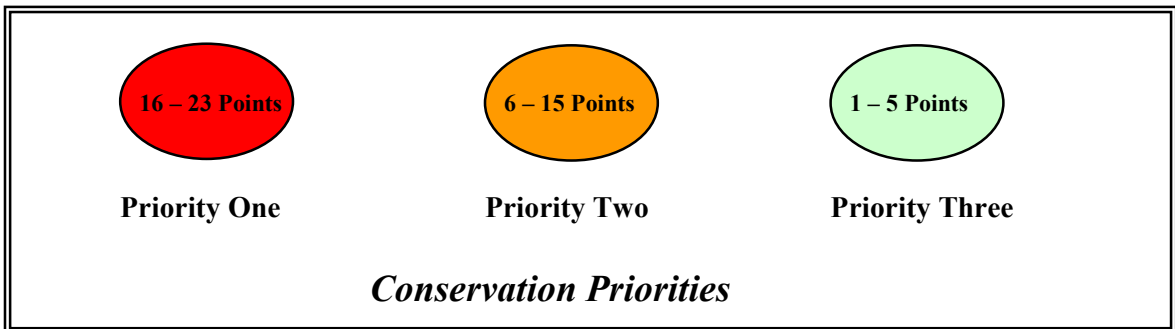
## High, Medium, & Low Ranking

Each of the 658 delineated sites was given a total score based upon the criteria described in the following table. With the element occurrences included in the criteria, total scores ranged from a high of 26 points (out of a possible 30 points) to a low of 1 point. Excluding the element occurrences, total scores ranged from 23 points (out of a possible 27) to a low of 1 point. Once the total scores were tabulated, the next step was to determine a logical and reasonable break between high priority, medium priority, and low priority sites. Many potential natural area sites can be just one point away from being placed into another category.

The method used for classifying was an iterative process taking into account the number of sites in a given category, the number of sites with the same score, and a visual inspection of spatial data layers in a geographic information system (GIS). Based on that analysis, it was determined that the element occurrence criteria was not a critical factor, and was eliminated from the categorization process. Looking at the data without the element occurrence scores, it appeared that there was a logical break between 15 and 16 points and another logical break

between 5 and 6 points. It could be argued that sites scoring one point below should be included in the higher category. It could also be argued that sites scoring right at the lower end of a given category should be placed in the next lowest category. To help alleviate anxieties, about which category a particular site is placed, actual numeric total scores can be displayed in the middle of each polygon. This would allow the viewer to see how a site compares directly to another site without artificially categorizing it with a group of other sites.

As a result of this analysis, a total of 266 sites were placed in the low priority category, 328 sites were placed in the medium category, and 64 sites were placed in the high priority category. Breaking it down into percentages of total sites identified, 40.4% were labeled low priority, 49.9% were labeled medium priority, and 9.7% of the sites were identified as high priority. It is important to note that although only 9.7% of the sites were identified as high priority, these 64 sites total 30,400 acres. This corresponds to 39.8% of the total acreage of all delineated sites (76,405 acres) or roughly one-third of the entire area.



### Site Criteria Table

<b>CRITERIA</b>	<b>DESCRIPTION</b>	<b>DETAIL</b>	<b>PTS</b>
<b>Size</b>	Total size of the polygon in acres.  <input type="checkbox"/> <i>Size is recognized as an important factor for viability of species and ecosystems.</i>	20 - 40 ac.	0
		>40 - 80 ac.	1
		>80 - 240 ac.	2
		>240 ac.	4
<b>Core area</b>	Acres of core area. - Defined as total area minus 300 ft. buffer from edge of polygon.  <input type="checkbox"/> <i>The core area is essential in order to limit negative impacts on "edge-sensitive" animal species.</i>	0 - 60ac	0
		>60 - 120 ac	2
		>120 - 230 ac	4
		>230 ac	8
<b>Stream Corridor</b>	Presence/absence of a stream or river within the polygon.  <input type="checkbox"/> <i>Stream corridors provide wildlife connections between patches of habitat.</i>	none	0
		present	2
<b>Landscape Connectivity</b>  Percentage	Percentage of potential natural areas of surrounding lands within 1/4 mile. - build 1/4 mile buffer - measure % of buffer that is a potential natural area	0 - 11%	0
		>11 - 22%	2
		>22 - 33%	3
		>33%	4
<b>Proximity</b>	Number of potential natural areas within (100 ft.).  <input type="checkbox"/> <i>Connectivity between habitat patches is considered a critical factor for wildlife health.</i>	0	0
		1	1
		2	2
		3	3
		4+	4
<b>Restorability</b>	Restorability of surrounding lands within 1/4 mi. - build 1/4 mile buffer - subtract potential natural areas from buffer - measure % agricultural lands and old fields  <input type="checkbox"/> <i>Restorability is important for increasing size of existing natural communities, providing linkages to other habitat patches, and providing a natural buffer from development.</i>	0 - 35%	1
		>35 - 65%	2
		>65%	3
<b>Element Occurrences (EOs)</b>	Known element occurrences increase the significance of a site.  <input type="checkbox"/> <i>The location of quality natural communities and rare species tracked by MNFI are often, although not always, indicative of the quality of a site.</i>	0	0
		1	1
		2	2
		3+	3
<b>Note</b>	Total possible points = 27 without EOs		
	Total possible points = 30 with EOs		

## Conclusion

This inventory documents that Oakland County remains rich with high quality natural resource areas that still look and function the way they did 200 years ago. Some of these sites have the potential of harboring endangered, threatened, or special concern animal and plant species. With the high rate of development and its associated stresses on the natural environment, conservation of these remaining areas and their native plant and animal populations are vital if the County's diverse natural heritage is to be maintained.

### Comments/Recommendations

- 1) Local units of government, individuals and interest groups using this information should consult the Shiawassee & Huron Headwaters Resource Preservation Project study. The study includes information on tools and techniques that conserve natural resources and create open space linkages while allowing for economically viable development.
- 2) Local municipalities should identify opportunities to link other possible natural resource sites not mapped during this survey. This would include small patches of land, tree and fence row plantings, agriculture land, and open fields.
- 3) Field inventories should be conducted on identified potential natural areas. This fieldwork would provide much needed additional site-specific data that should be considered when developing in and around such areas.
- 4) All identified sites, regardless of their ranking, have significance to their local setting. This is especially true in areas that have experienced a high degree of development and landscape fragmentation.
- 5) Recent scientific studies have found a direct relationship between natural area protection and long-term water quality. With the abundance of water resources found in Oakland County and the potential impact on the economy associated with degradation of these resources, this direct link should not be overlooked. Protecting a natural area protects the water resources in the area as well.
- 6) Municipalities should adopt a comprehensive conservation/greenway plan. The conservation of potential natural areas is most effective, and successful, in the context of an overall conservation/greenway plan.
- 7) Oakland County Planning & Economic Development Services should incorporate funding into the annual budget in order to update mapping and assessment of County potential natural areas.

- 8) Efforts to conserve potential natural areas should include on-going site assessment and monitoring.
- 9) Oakland County Planning and Economic Development Services should undertake widespread distribution of this survey in order to build awareness and encourage long-term resource planning and stewardship. Knowledge of potential natural areas is meaningless unless action is taken to ensure that they will remain part of the County's natural heritage.

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