



Natural Areas Site Analysis Guide

(A guide for use in the development of a site analysis when nominating a natural area)

The site analysis is a narrative that should describe and assess the nominated Natural, Wild or Wilderness Area so that someone unfamiliar with the site can get an informed sense of the importance of the site. It should address as much of the information below as possible. It is intended to describe the value of the area, how the site will enhance the Michigan Natural Areas System, and what will be required to conserve the area. The analysis should be concise, single-spaced, with a minimum of 11 point font.

Consider the following while preparing the site analysis. Some of the information may not be applicable to the site and some information may not be available, but include as much of this information as possible.

Size

- How large is the proposed Natural Area? (Acres)

Ecoregion/Watershed

- In which watershed/ecoregional subsection does it occur? (see Clark 1999 for watershed map and Albert 1995 for ecoregional map)
- Does it fill a conservation or representation gap within the ecoregion/watershed?

Ecological Systems/Landscape Features/Natural Communities

- *Ecological System(s)* - are a mosaic of natural communities that occur in a dynamic complex or mosaic on the landscape. These natural communities should be linked by ecological processes, underlying environmental features (e.g., soils, geology, topography, headwaters), or environmental gradients (e.g., elevation, precipitation, temperature), and by species or communities (e.g., through migration, use during different life stages, or gradual species turnover across environmental gradients). Functional relationships (connectivity, hydrology, fire, wind events, flooding, etc.) among the communities must be intact or restorable. An example of an ecological system would be a Great Lakes shoreline complex with a cobble beach, an open dune, and a great lakes barrens natural community.
- *Landscape feature(s)* – a list of general ecosystem types (e.g., prairie, lowland conifer forest, coolwater-headwater stream); for examples see tables 3 & 4 (pages 14-17) in the Michigan Wildlife Action Plan at <http://www.michigan.gov/dnrwildlifeactionplan>.
- *Natural Communities* - a list of specific natural communities that occur within the site boundaries, with emphasis on imperiled or excellent quality communities (G1/G2/G3 and/or S1/S2 and/or "A" ranked). If an area has not been recognized as a natural community by Michigan Natural Features Inventory and therefore has not been identified or assessed, information collected at the site (e.g., photos, species lists and a description of site conditions) may be used for a preliminary assessment of communities that may occur on the site and what condition they may be in. Further surveys may still be required for the nomination to proceed.

See http://web4.msue.msu.edu/mnfi/data/MNFI_Natural_Communities.pdf for a list of Michigan natural communities (e.g., oak barrens, lakeplain wet prairie, alvar, patterned fen).

- Habitat structural components (e.g., complex vegetative layers, woody debris, braided stream channel, rocky outcrop, spring seeps)
- Does the area fill a gap (conservation or representation)? Does it protect a previously unprotected community type within the region? Michigan's Natural Areas Program should help ensure representation of the full range of our natural heritage for present and future generations.

Animal and Plant Assemblages/Species

[If extensive species lists are included, these may best be presented as a table attached to the Site Analysis.]

- Focal animal and plant assemblages that use the area (e.g., amphibians, forest interior song birds, grassland butterflies, sedges, mollusks). Include a list (best available) of species for any critical focal group.
- A list of endangered, threatened, and special concern animal and plant species ("element occurrences" or EOs) and/or unique species (e.g., Michigan species of greatest conservation need).
- Any other species or assemblages that provide essential ecosystem function (e.g., keystone species, umbrella species, pollinators, detritivores).
- Floristic Quality/Biological Integrity/Species Diversity indices – Include any indices that have been used to assess biological conditions at the site. These may include the floristic quality index (Herman 2001; uses native plant species to assess natural community condition), an index of biotic integrity (such as Kenaga et al. 2003 for coastal wetlands or Michigan Department of Environmental Quality 2002 for streams and rivers; these use native fish or aquatic insects to evaluate aquatic conditions and subsequently riparian and upland conditions within the watershed), and a variety of other indices that measure the integrity or condition of a species assemblage or community (e.g. species richness, species diversity index).

Ecological Processes/Function

- What are the predominant ecological processes that influence the site (e.g., hydrologic regime, fire regime, windthrow)?
- Are these processes functioning naturally or are they restorable?
- Does the area provide an integral function for biodiversity conservation, the Natural Areas System, or large-scale landscape processes (e.g., hydrologic recharge, connectivity, nutrient processing, sediment retention, productivity, headwaters, migratory stopover)?
- Does the area adequately encompass all of the elements to ensure long-term maintenance of the structure and function of the natural communities within the area?

Social/Human Experience

- Is the area in close Proximity to an urban area ($\geq 100,000$ pop.)?

- Does this area provide the ability to have a unique experience (solitude, or exceptional hiking, hunting, fishing, or wildlife viewing)?
- Does the area offer unique opportunities for research or natural history assessments?
- Is the area of cultural significance (e.g., archeological, historic landmarks, etc.)? More information on culturally significant areas can be found at the State Historic Preservation Office website:
http://www.michigan.gov/hal/0,1607,7-160-17445_19273_19318---,00.html

Scenic Elements

- Are there specific scenic elements that make this area unique (waterfall, unobstructed view, shoreline, fall color)?

Geologic Elements

- Does the area include a unique geologic feature (e.g., bedrock beach, dunes, cliffs, sinkholes, caves)?

Suggested Conservation Targets

- What elements discussed above are the most important to conserve within this area? Conservation targets are unique, imperiled, or critical components of the natural environment. A suite of conservation targets should, together, reflect the condition, scale and uniqueness of the nominated natural area. Conservation targets will be the focus of planning efforts for the nominated natural area (e.g., boundary delineation, conservation actions).
- Conservation targets are usually limited to 8 or fewer and generally include ecological systems, landscape features, or natural communities. Species, geological elements, and scenic, recreational or education opportunities may also be included.

Landscape Context

- What is the landscape context of the site? In other words, what is the surrounding land cover and land use and how may these influence site conditions currently and in the future? Does the area occur within a relatively intact landscape that will help ensure the long-term ecological sustainability of the site? Will designation of this area enhance the landscape context of other important areas (e.g., enhancement of a Wild and Scenic River)?

Site Condition

- Has the site been primarily unaffected by human influences? How “pristine” is the area?

- What are the historical human impacts to this site? What previous land uses were on site? How was it managed in the past? How have these uses affected the natural communities on the site? Are there other site alterations that indirectly resulted from human influences (e.g., invasive species, pollution)?
- Is restoration necessary at the site and how restorable is it? If restoration is necessary, what is the potential for restoring the structure and function of natural communities at the site?

Threats/Restorability/Damage

- Conservation threats (e.g., invasive species, fragmentation, fire suppression, hydrologic alteration, ORV use) in the area should be discussed, with attention to how they may impact each conservation target. What are the current threats to the area? What is the source of each threat and how is it stressing the communities or ecosystems on the site? How severe is each threat? For examples of threats see p. 20-22 of Michigan's Wildlife Action Plan at <http://www.michigan.gov/dnrwildlifeactionplan>. Include any available evidence documenting existing threats, including photos, studies, reports, etc.
- What are potential *future* threats to the area (e.g., development, fragmentation, hydrologic alteration, invasive species)? What is the source of each threat and how might it impact the communities or ecosystems on the site? How imminent is each threat?
- Will any threats be addressed by designation of this area as a Natural Area? If so, how?

Management Actions Needed

- What management is required to maintain, restore, or enhance the area? Are there management actions necessary to address threats? How urgent are the management needs and how frequently might management be necessary? What time frame would be necessary for restoration?
- Management actions should help to ensure that conservation targets persist indefinitely.

Conservation Partners

- Are there agencies, organizations, businesses, citizens groups, or individuals that have an interest in the conservation values of the area? What role might they play as conservation partners? A description of conservation partners might reference letters of recommendation provided with the nomination.

Resources

- Please list any publications, reports, information from knowledgeable individuals, etc. that are relevant to the nomination of this area as a Natural Area.

Collaborators

- Have collaborators been identified?
- Have experts familiar with the natural or ecological elements of the site been identified?
- For nominations on private lands, please be sure to include a letter of support from each landowner.

Any other issues of importance not previously addressed?

- Please feel free to provide any other information that may be relevant for consideration of this area as a natural area.

References

Albert, D.A. 1995. Regional landscape ecosystems of Michigan, Minnesota, and Wisconsin: a working map and classification. Gen. Tech. Rep. NC-178. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. Northern Prairie Wildlife Research Center Online. <http://www.npwr.usgs.gov/resource/habitat/rlandscp/index.htm>

Clark, J.S. 1999. Michigan's Major Watersheds. Hydrologic Studies Unit, Land and Water Management Division, Michigan Department of Environmental Quality. http://www.dnr.state.mi.us/spatialdatalibrary/PDF_Maps/Watersheds/Major_Watersheds_24k.pdf

Herman, K. D., L. A. Masters, M. R. Penskar, A. A. Reznicek, G. S. Wilhelm, W. W. Brodovich, and K. P. Gardiner. 2001. Floristic Quality Assessment with Wetland Categories and Examples of Computer Applications for the State of Michigan – Revised, 2nd Edition. Michigan Department of Natural Resources, Wildlife, Natural Heritage Program. Lansing, MI. 19 pp. + Appendices. <http://www.michigandnr.com/publications/pdfs/HuntingWildlifeHabitat/FQA.pdf>

Kenaga, D., T.M. Burton, D.G. Uzarski, and D.A. Albert. 2003. Monitoring and evaluation of coastal habitats for potential restoration activities. Final Report (MDEQ Grant # 02-309-01b) to the Michigan Coastal Management Program, Land and Water Management Division, Michigan Department of Environmental Quality. <http://www.deq.state.mi.us/documents/deq-ess-cm-coastalhabitats-burton.pdf>

Michigan Department of Environmental Quality. 2002. Qualitative biological and habitat survey protocols for wadable streams and rivers. Great Lakes and Environmental Assessment Section Procedure #51, Revised May 2002, Michigan Department of Environmental Quality, Surface Water Quality Division. <http://www.deq.state.mi.us/documents/deq-swq-gleas-proc51.pdf>