

NATURAL LANDS INVENTORY

Lower Cass River
2010-2011



Welcome

In 1831, Alex de Tocqueville, a reporter for a Paris newspaper, was sent to America, to write about the edge of civilization, “the last frontier,” wherein his travels brought him to Saginaw, Michigan. On that trip he wrote his impressions of the Cass River:

A turf covered point projecting above the river in the shade of great trees served us as a table and we sat down to luncheon with a view of the river whose waters clear as crystal, snaked through the wood.

This vision of pristine waterways and beautiful natural areas is what motivated a local group of citizens to form the Cass River Greenway Committee in 2007. Organized by a group of local volunteers, assisted by

professional resources and municipal leaders, the Cass River Greenway Committee is working to enhance recreational opportunities and the environmental well-being of the Cass River Corridor.

To meet these objectives, the Cass River Greenway Committee is taking a regional approach in its efforts. Through development of recreational opportunities that enhance local quality of life and support development of ecotourism, promotion and preservation of wildlife habitat and natural lands, and improvements to water quality, the Cass River Greenway Committee aims to engage and educate the local residents, property owners and visitors about the abundance of natural assets the region offers that support and strengthen the community and local economy.

All too often, planning for recreation, water quality, trails, and open space ends at county, township, and municipal borders. Regions that don't work together can end up with a patchwork landscape that doesn't make sense and that separates communities. The Cass River Greenway Committee envisions connected communities, cooperation across borders, and stronger regional ties.

This report does not attempt to identify all of the "hidden jewels" in the lower Cass River Greenway. It takes a "macro" approach, looking at large intact tracts of landscape, undivided by roads and other barriers, that have the highest capability of protecting water quality and the native plants and animals. It is a good first step in looking at the entire landscape of the Cass River Greenway, and focusing on those areas most likely to contribute to the overall health of the environment.

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Resource Planning

Planning, when done well, is among the most powerful tools available to communities. Resource based planning is a process that puts a community's unique natural features at the forefront of these efforts. Based on good information and sound decision making, planning can guide rational land use decisions. It allows our communities to consider innovative tools for resource protection with fewer chances for legal challenges. And more importantly, it sends a clear message as to what our communities value and wish to preserve.

Place matters as Michigan rethinks its path to restoring prosperity in the 21st century. The value of places depends very much on the diversity and beauty of the natural resources unique to Michigan. Our state was graced with abundant natural lands. Now, with their number much reduced, we depend on local actions to address the conservation of these lands and our state's natural heritage.

Natural lands can serve a number of functions such as filtering water, providing recreational opportunities, and maintaining wildlife habitat. Each of these functions enhances the overall vitality and prosperity of the region. By inventorying natural lands, Cass River communities can determine where development is most appropriate. This way, we can avoid the unintended consequences of the typical planning process, such as open space becoming the 'leftover' pieces, water resources being degraded, and our unique character being compromised.

Natural resource conservation is a fundamental component of any community's long-term environmental and economic health. It is to our advantage that these resources be carefully integrated into the planning for the future development of our communities. Striking a balance between development and natural resource conservation and preservation is critical if the communities along the Cass River are to sustain their unique natural heritage.

This inventory identifies and ranks the remaining natural lands in Bridgeport, Frankenmuth, Tuscola, Vassar, Juniata, and Indian Fields Townships in Saginaw and Tuscola counties.

Natural lands 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, corridors for wildlife travel, stopover sites for migratory birds, sources of genetic diversity, and floodwater retention. However, the actual ecological value of these natural lands can only be truly determined through on the ground surveys.

Resource planning uses a science-based approach to identify natural lands in the Cass River Greenway and adjacent lands that, with proper management, would ensure the long-term persistence of the river's biodiversity, the ecological processes needed to maintain these elements, and ecological stability. By conducting a landscape level analysis for conservation suitability of the natural resource base, potential conservation lands are identified and prioritized, providing a strategic framework for resource protection and land conservation activities.



Successful resource protection requires more than simply conserving 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 Cass River, a more holistic approach to resource conservation must be taken.

The process used in this inventory was established by the Michigan Natural Features Inventory and has been used extensively in southern Michigan. It has been adapted here to assess the natural lands of the townships that intersect with the lower Cass River watershed and to rank them based on their natural resource values. It is recommended that the Cass River communities incorporate this information into their master and recreation planning processes. It is further recommended that local governments and agencies find ways to assist private landowners in their own efforts to protect land. The site maps and ranking data can be used by local municipalities, land conservancies, and other organizations to prioritize their conservation efforts and assist in finding opportunities to conserve Cass River communities' unique natural heritage.



Delineating Natural Lands

Natural lands are places on the landscape dominated by native vegetation, such as forests, wetlands, and stream corridors. Natural lands perform important ecological services such as maintaining water quality, providing places for recreation, and protecting wildlife habitat. Natural lands are a fundamental component of the Cass River communities' long-term environmental and economic health.

The first step in the natural lands inventory for the lower Cass River Greenway communities of Bridgeport, Frankenmuth, Tuscola, Vassar, Juniata, and Indian Fields Townships in Saginaw and Tuscola counties was to create an accurate base dataset using geographic information systems (GIS) that delineated these natural lands from other areas with a high degree of human influence such as residential, commercial, and industrial areas. This base dataset was created by identifying natural lands through visual interpretation of 2009 aerial photography from the United States Department of Agriculture Natural Resource Conservation Service Geospatial Data Gateway.

The natural lands data layer developed through interpretation of the 2009 true color aerial photography identified and grouped undeveloped areas including forests, wetlands, and stream corridors into a single natural areas land use category. This process was completed for the six township focus area and included a buffered area of one mile outside of the focus area extending into the surrounding townships. The buffered area was included in order to ensure accurate scoring of natural areas that were along and/or extended beyond the boundaries of the focus area.

This process resulted in a dataset that contained contiguous blocks of natural lands. Lakes and streams were treated as part of a contiguous block when they were surrounded on all sides by natural land cover. Lakes and streams with residential, commercial, or industrial areas adjacent to them were not included as part of a contiguous block. Sixty-six foot road corridors were then extracted from the contiguous blocks of natural lands previously created. The resulting dataset was then filtered to exclude any natural lands that were less than 10 acres in total size. The final Natural Lands Inventory dataset contains contiguous blocks of forests, wetlands, lakes and streams, and beaches that are 10 or more acres in total size. This delineation process identified a total of 354 discrete areas of natural lands in the lower Cass River Greenway communities.

The use of the term natural in this report is not intended to imply that these lands are without human alteration or influence. The decision to use this term was made in an effort to provide the reader with best understanding of the types of lands that were delineated in this inventory.

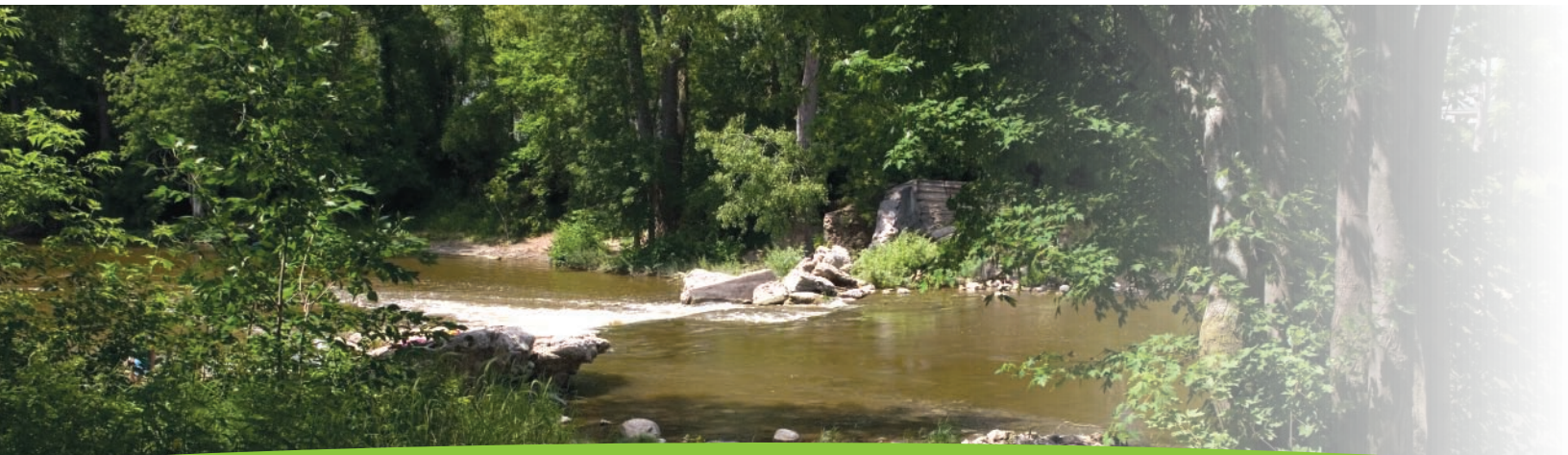
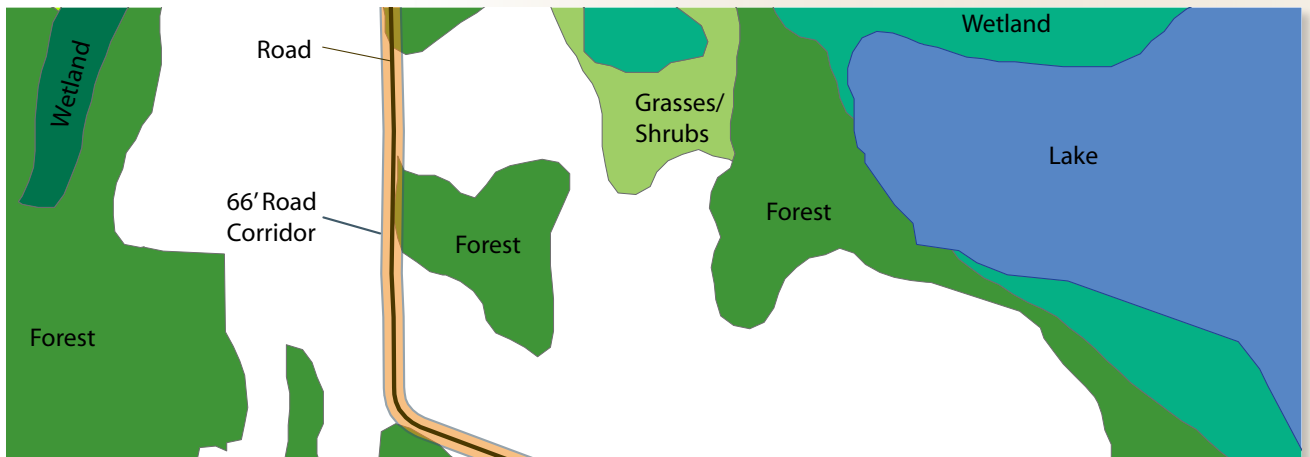


FIGURE 1. Diagram illustrating the delineation of natural lands.



2009 aerial photography from the USDA NRCS Geospatial Data Gateway shown at 1 to 6,000. Red lines depict a 2.5 acre grid.



Updated land cover polygons displayed at 1 to 6,000 with 66 foot road corridor.



Natural land boundaries displayed at 1 to 6,000.

Ecological Prioritization

The Lower Cass River Greenway Natural Lands Inventory identified discrete natural areas in a in the townships of Bridgeport, Frankenmuth, Tuscola, Vassar, Juniata, and Indian Fields and the Cities of Frankenmuth and Vassar. The study area included the total land area of these municipalities as well as an area extending one mile beyond the boundaries of these municipalities. 511 discrete natural areas that cover a total of 60,089 acres were identified within the study area.

Each of the 511 identified discrete natural lands in the lower Cass River Greenway was evaluated for nine criteria. For each criterion, sites were assigned a score. Scoring criteria and breaks were adapted from the scoring system developed by the Michigan Natural Features Inventory (MNFI) for identification and ranking of potential conservation areas (table 2). A final rank was calculated by summing the scores of all nine criteria and using natural jenks breaks in the distribution of total scores, grouped into three clusters that served as an ecological ranking. This ranking scheme produced a total 41 possible points. Actual scores for sites ranged from 1-33 points.

As a result of applying the natural break method, ten percent (53) of the total sites mapped were ranked priority-one (high priority); 30% (153) were ranked priority-two (medium priority); and 60% (305) ranked priority-three (low priority). Priority-one sites accounted for 21% (12,455 acres) of the total area of all delineated natural lands; priority-two sites accounted for 34% (20,227 acres); and priority-three sites accounted for 15% (9,084 acres).

It is important to note that the lower Cass River Greenway has a significant amount of land identified as existing recreation and conservation areas. Of the natural areas identified in this assessment, approximately 24% (14,070 acres) is land identified as conservation or recreation land. Many of the priority-one natural areas fall within the boundaries of these lands.



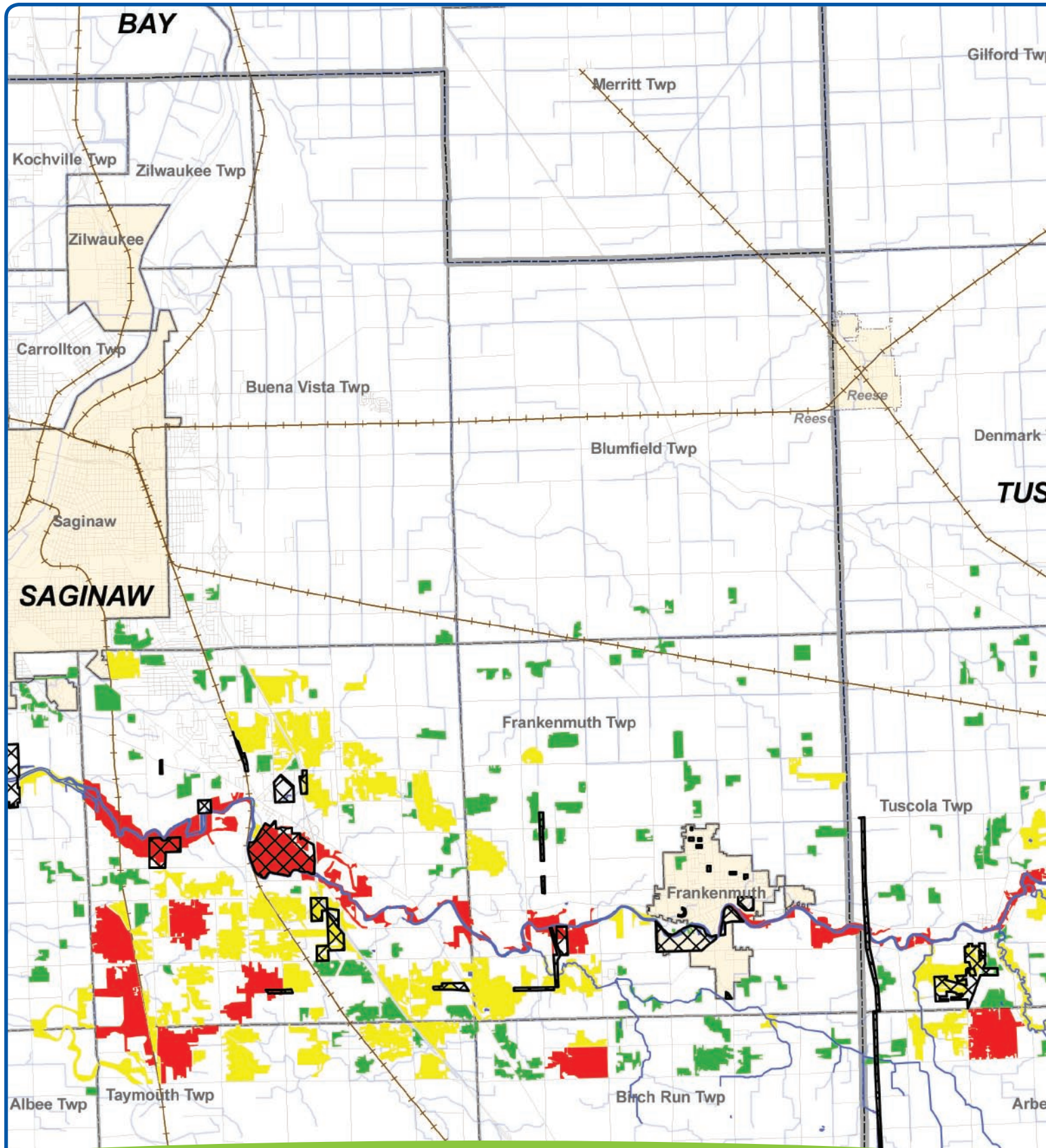
Table 1. Score Distributions for Ecological Ranking of Natural Lands.

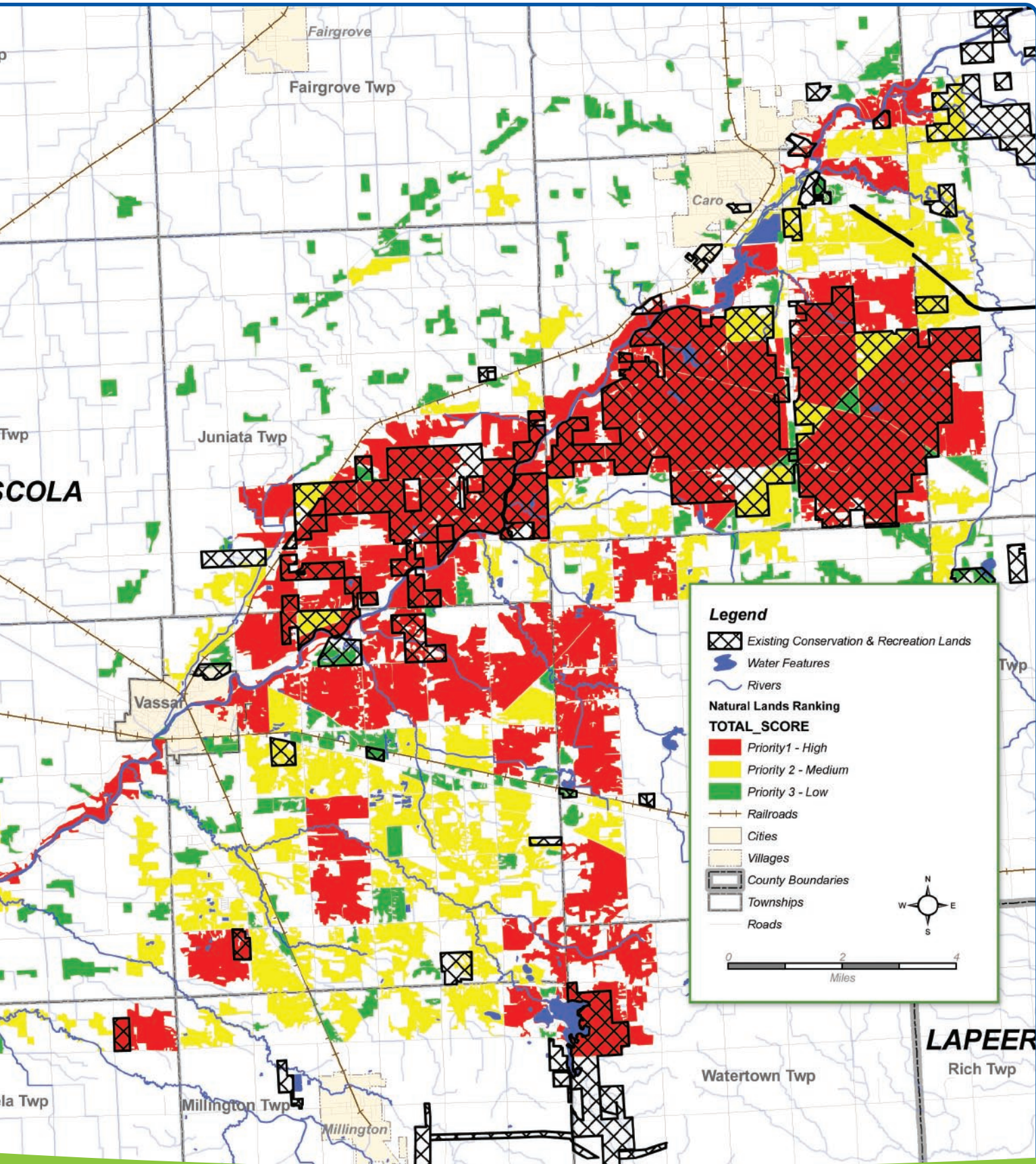
Priority	Points	Number of PCAs
One - High	20-33	53
Two - Med.	11-19	153
Three - Low	1-10	305
41 Total Possible Points		

TABLE 2. Scoring Breaks for Prioritization Criteria.













Criteria	Detail	Score	Criteria	Detail	Score
Total Size	10 - 40 ac	0	Biorarity Score	0 - 0.1296	0
	>40 - 80 ac	1		0.1297 - 0.5147	1
	>80 - 240 ac	2		0.5148 - 0.8750	2
	>240 ac	4		0.8751 - 1.750	3
Core Area	0 - 60 ac	0		1.7501 - 3.25	4
	>60 - 120 ac	2	Vegetation Quality: Total Acres of Unchanged Vegetation	0 - 10 ac	0
	>120 - 230 ac	4		10.1 - 40 ac	1
	>230 ac	8		40.1 - 80 ac	2
Stream Corridor	0	0		80.1 - 160 ac	3
	>0 - 400 m	1		> 160 ac	4
	>400 - 800 m	2	Vegetation Quality: Percentage Unchanged Vegetation	1 - 10%	0
	>800 - 1600 m	3		10.1 - 30%	1
	>1600 - 3200 m	4		30.1 - 65%	2
	> 3200 m	6		65.1 - 100%	4
Landscape Connectivity: Percentage	0 - 11%	0		Restorability of Surrounding Lands	0 - 35%
	>11 - 22%	2	>35 - 65%		2
	>22 - 33%	3	> 65 %		3
	>33%	4	Landscape Connectivity: Proximity	0	0
1	1	1		1	
2	2	2		2	
3	3	3		3	
	4+	4		4	

Lower Cass River Natural Lands Inventory





Legend

-  Existing Conservation & Recreation Lands
-  Water Features
-  Rivers
- Natural Lands Ranking**
- TOTAL_SCORE**
-  Priority 1 - High
-  Priority 2 - Medium
-  Priority 3 - Low
-  Railroads
-  Cities
-  Villages
-  County Boundaries
-  Townships
-  Roads



Ranking Natural Lands

The strategy for ranking the lower Cass River Greenway's natural lands was based on an evaluation of criteria that reflected general biodiversity based on the principals of landscape ecology. These criteria can be thought of in general terms: bigger is better than smaller; connected is better than isolated; and the presence of waterbodies and wetlands increases biodiversity value (FIGURE 2).

These criteria were evaluated for each natural area by converting the criteria to numeric scales and assigning a score to each. Following is a description of the importance of each criteria and a general description of how it was calculated.

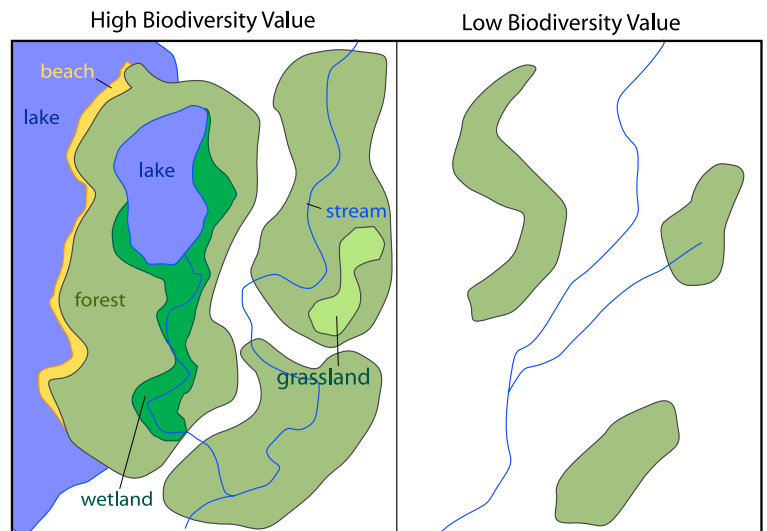


FIGURE 2. Generalized diagram illustrating relative biodiversity value based on size and shape, proximity, and diversity of land use types.

Total Size

Human modifications to the landscape result in the fragmentation of natural lands. Fragmentation is the process by which natural lands are broken into more and smaller pieces. In fragmented landscapes, large patches of natural vegetation offer many values; water quality protection for aquifers and lakes, resilience of ecological function in response to disturbance such as floods or tornado, a source for species to move through the landscape, escape cover for species with large home ranges, and many others.

The total size is simply the calculated total acres of each site (FIGURE 3).

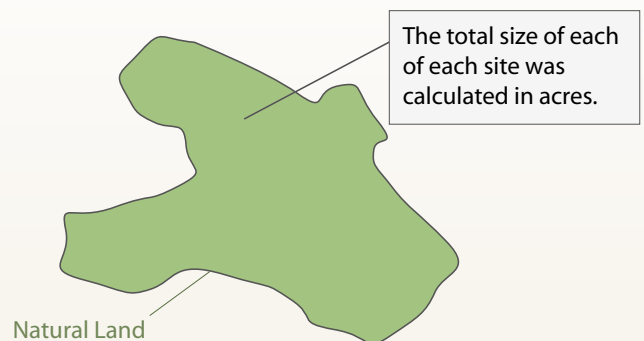


FIGURE 3. Generalized illustration of the total size calculation for natural lands.

Core Area

The core can be thought of as the interior portion of a site that is removed from the outer edge. It has been shown that many species are sensitive to human development and frequent disturbance associated with the edges of natural lands. The range of species inhabiting the edges of a site tends to be greater than of the interior however, relatively few rare species inhabit the edges.

Core area was calculated by constructing a - 300-foot buffer from the edge of each site and calculating the size of that buffer in acres (FIGURE 4).

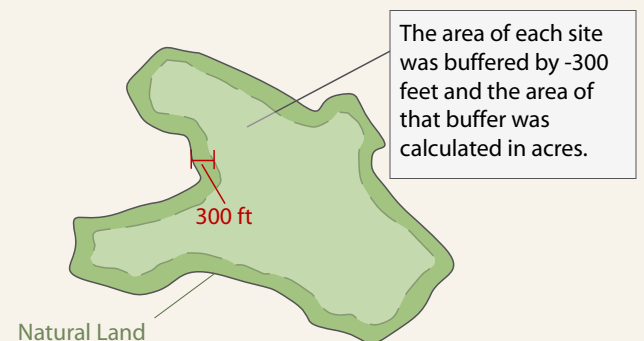


FIGURE 4. Generalized illustration of the core area calculation for natural lands.

Length of Stream Corridor

The presence of streams and rivers within natural lands increases the ecological value. Stream corridors support high diversity of both plant and animal species. Plants utilize the increased water and nutrients. Many wildlife species in the surrounding natural area depend on these stream corridors for water, food, and shade.

The length of stream corridor was calculated by summing the length of each stream segment that intersected each site in feet (FIGURE 5).

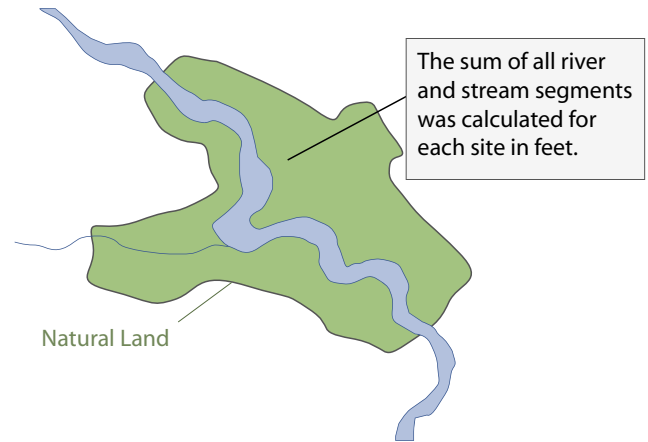


FIGURE 5. Generalized illustration of the stream corridor calculation for natural lands.

Landscape Connectivity

In fragmented landscapes, the connectivity of the remaining natural land is crucial to ecosystem health and function. The movement of wildlife and dispersal of plants is increased in landscapes comprised of highly connected natural land. Highly connected natural land also promotes natural disturbance regimes such as flood, fire, and pollination. Landscape connectivity was evaluated using two criteria; proximity and percentage.

Proximity

Proximity is the measure of the number of other natural lands within 100 feet of each site. This was calculated by building a 100-foot buffer around each site and summing the number of other natural lands that intersect with the buffer (FIGURE 6).

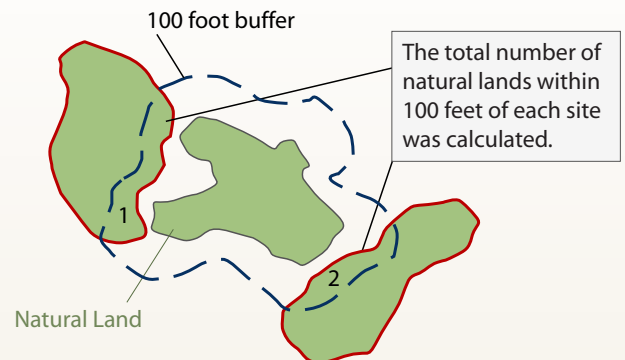


FIGURE 6. Generalized Illustration of the proximity calculation for natural lands.

Percentage

Percentage is the measure of how much of the area within ¼ mile of each site is occupied by other natural lands. Percentage was calculated by building a ¼ mile buffer, then calculating the percentage of that buffer that was occupied by natural land (FIGURE 7).

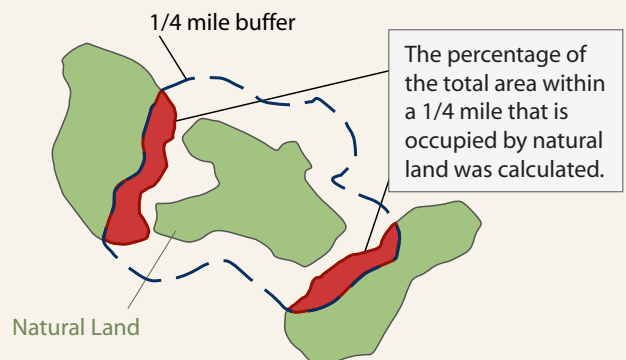


FIGURE 7. Generalized illustration of the percentage calculation for natural lands.

Biological Rarity

The biological rarity index was developed by the Michigan Natural Features Inventory and applied statewide. This index is based on the Michigan Natural Features Inventory database of known sightings of rare, threatened, and endangered species. This dataset gives a score to each of the 40 acre quarter-quarter sections in the State of Michigan.

The biological rarity of each site was calculated by taking the mean score of all 40 acre quarter-quarter sections that intersected with that site (FIGURE 8).

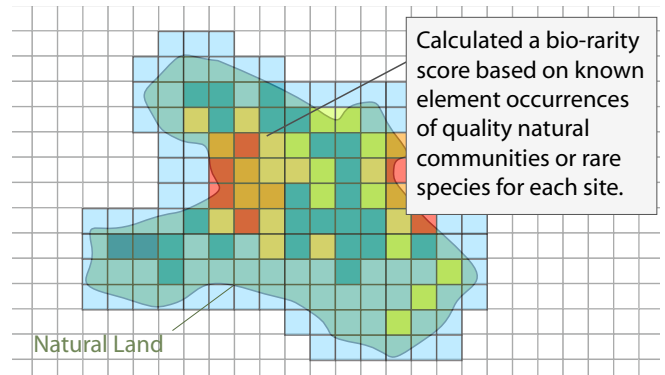


FIGURE 8. Generalized illustration of the biological rarity calculation for natural lands.

Vegetation Quality

The vegetation quality criteria used vegetation change information also developed by the Michigan Natural Features Inventory. The vegetation change dataset compared vegetation circa 1800 data to vegetation data from 2001. The vegetation change 1800-2001 dataset describes the landscape based on changes in the vegetation communities. This analysis assumes that sites with no change in the vegetation communities potentially possess higher vegetation quality.

Vegetation quality for sites was calculated in two ways; the total acres of unchanged vegetation and the percentage of unchanged vegetation.

Total Acres of Unchanged Vegetation

The total acres of unchanged vegetation criterion was calculated by summing the total area of all unchanged vegetation that intersects each site. Sites with large amounts of unchanged vegetation receive a high ranking for this criterion (FIGURE 9).

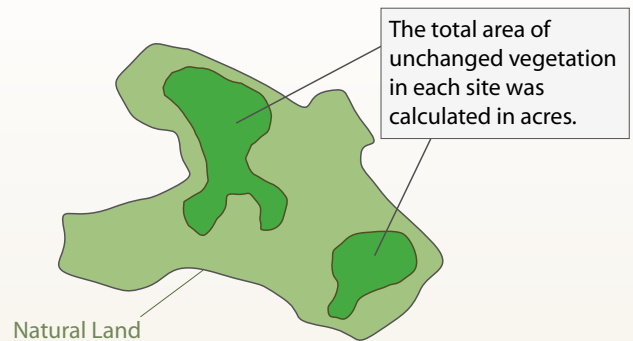


FIGURE 9. Generalized illustration of the total acres of unchanged vegetation calculation for natural lands. The dark green shapes represent unchanged vegetation.

Percent Unchanged Vegetation

The percentage of unchanged vegetation was calculated for each site. This provides smaller sites that potentially have high quality vegetation to receive a high ranking (FIGURE 10).

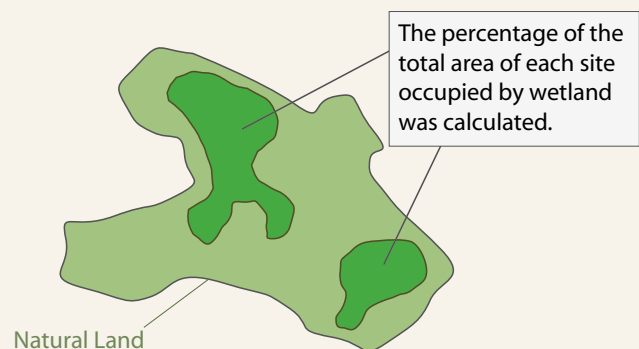


FIGURE 10. Generalized illustration of the percent unchanged vegetation calculation for natural lands.

Landscape Restorability

The proximity of natural lands to other restorable land is an important factor in determining the ability to increase the linkages.

Landscape restorability was evaluated by calculating the percentage of agricultural land identified as NOAA C-CAP satellite imagery land use areas for cultivated crops and hay/pasture that was within a 1/4 mile from each site (Figure 11).

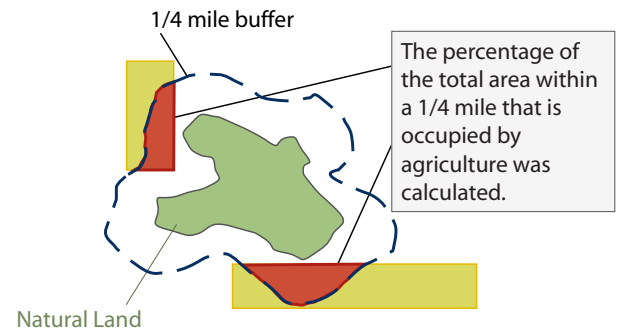


FIGURE 11. Generalized illustration of the landscape restorability calculation for natural lands.

Proximity to Protected Lands

The proximity of natural land to protected land is an important factor in a people's ability to facilitate natural and social connections between conservation lands. Protected lands can include national and state parks and forests, municipal parks, and conservancy-owned properties.

The proximity to protected lands was calculated by building a 1/4 mile buffer for each site and calculating the area of that buffer that is occupied by protected lands (FIGURE 12).

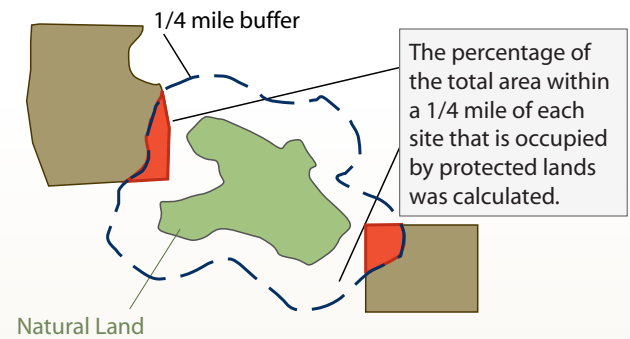


FIGURE 12. Generalized illustration of the proximity to protected lands calculation for natural lands



Assuring Great Places

Natural resources are a fundamental building block of every city, township, and county. Just as each community has a “gray infrastructure” of streets and utilities, communities also have a “green infrastructure” of the natural systems in and around them. Green infrastructure provides environmental benefits like supporting wildlife, improving the quality of air and water, and providing places for people to interact with nature.

Natural resources also provide many other benefits for your community, such as:

- Improving human health, well being, and quality of life
- Minimizing the effects of floods
- Increasing property values
- Reducing energy costs
- Reducing infrastructure costs
- Supporting economic development and tourism

It's very important that your community is clear about the intended use and management of its existing and planned natural areas. By thinking in these functional terms, your community can effectively define and plan for all its natural resource related needs, now and in the future.

Land Use Regulations

As provided in your community's comprehensive plan, a primary set of tools for conserving and managing natural resources are land use regulations, such as subdivision regulations, zoning ordinances, overlay zones, planned unit development (PuD), urban growth area/boundaries, etc.

Subdivision Regulations: How your community subdivides land for development will have serious, and often unintentional and unnecessary, impacts on natural resource conservation. During subdivision, your community makes fundamental decisions on how much land development will consume, how much of it will be paved (made impervious to water infiltration), and whether opportunities for community trails, greenways, and natural areas are retained or lost forever.

Zoning Ordinances: Historically, zoning ordinances have been a mechanism for separating different land uses. Now, your community may apply zoning creatively through using planned unit development, mixed use zoning, overlay zones, incentive

zoning, transfer of development rights, growth management, and other tools (some referenced below) that offer greater opportunities to efficiently use land while conserving resources.

Bonus/incentive Zoning: The premise of incentive zoning tools is that your community can gain qualities it wants - such as natural resource conservation, energy/resource efficiency, and/or affordable housing - in exchange for something the private developer would like - such as higher density.

Large Lot Zoning: Provides for large minimum lot sizes, such as five or ten acres per dwelling unit. Development in your community is spread over a large area, reducing density.

Performance Zoning: Zoning categories are based on permissible impacts to natural or historic resources, instead of a list of permitted uses. This type of zoning requires impact assessment of proposed development projects.

Overlay Zones: An overlay zone or district allows special regulations within all or part of one or several zoning districts. Your community could use this tool to guide or limit development in floodplains, along shorelands, next to airports, in historic preservation districts, and so forth.

Planned Unit Development (PUD): Your community can creatively plan development and conservation for a larger parcel through a PUD rather than a typical subdivision process. This is the mechanism by which some communities are implementing. “Conservation subdivisions” - in which contiguous open space and natural areas are preserved and development is efficiently clustered on the less vulnerable parts of the site. Permanent protection of the natural area typically depends on a use of a conservation easement.

Plan/Design Review: Many communities require plans to be submitted for review and approval before a local permit is issued. To provide meaningful natural resource conservation, plan review must be authorized and designed to significantly influence fundamental ecological, land cover and water management issues. Also, applicants need to be provided with the standards/guidelines as early as possible. When well done, site plan review is an effective tool for minimizing localized environmental impact and achieving improved, and at times innovative, storm water management, conservation of native soil and vegetation, tree protection, etc.

Urban Growth area/Boundaries: A local comprehensive plan may include policies on how your community would like to direct future development. An “urban growth area” is the land needed to accommodate projected residential, commercial, and/or industrial development over a specified period of time.

Voluntary Approaches

There are also a number of approaches to natural area preservation that do not require the creation of land use regulations. Voluntary approaches such as conservation easements or acquisitions can be combined with regulatory measures to broaden the effectiveness of your preservation program.

Conservation Easements: A conservation easement is a legal tool by which a landowner agrees to specific restrictions on development and land use. Conservation easements may be established to assure that land remains available for agriculture, forest, recreational or open space, etc. the easement is ‘held’ by a qualifying private or governmental organization, which enforces the restrictions on land use. Conservation easements are voluntary and permanent - the land remains subject to the easement restrictions even if ownership changes.

In some cases, such as when natural areas are involved in a subdivision, local governments may choose to require a conservation easement as part of the subdivision process. Or, your community may want to establish conservation easements on existing public land with high quality natural areas.

Lease: A lease is an agreement between an agency and a landowner to rent the land in order to protect and manage a sensitive or high quality resource.

Management Agreement: Management agreements occur between a landowner and a conservation agency to manage property to achieve specific resource conservation goals.

Mutual Covenants: A mutual covenant is an agreement between adjoining landowners to control future land uses through mutually agreed upon restrictions.

Fee Simple Acquisition: A local landowner may wish to sell land with significant natural resource value. Usually, fee simple acquisitions include the sale of land at full market value whereby the ownership and responsibilities are transferred completely to the buyer.

Bargain Sale: With a bargain sale, land is purchased at less than fair market value. The difference between the bargain sale price and the land’s fair market value becomes a donation by the seller.

Purchase of Development Rights (PDR): The owner’s rights to develop a parcel of land are sold to the local government or to a land trust. Most PDR programs are voluntary and offer a viable financial option to interested landowners.

Purchase of Timber Rights and Other Easements: In addition to purchasing development rights, timber rights could also be purchased. Other ‘customized’ easements could be developed as needed depending upon the resource in question.

Heritage Registry: Communities, conservation organizations, or other groups may wish to use a registry program to recognize and encourage private citizens who own land containing natural areas. Participation in a land registry is informal and non-binding, and involves a pledge from the landowner to provide good land stewardship.

Voluntary Agricultural Districts: Special agricultural districts can be established to promote continuation of agricultural and forestry activities.

Outright Donation: The landowner grants full title and ownership to a conservation group.

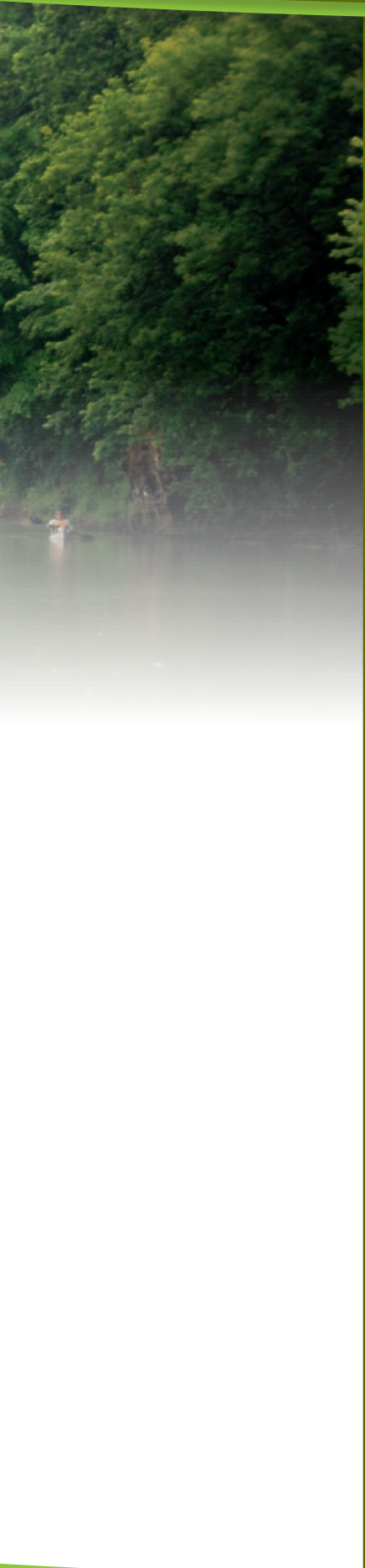
Education and Outreach: Your community can engage private landowners with education and outreach in an effort to improve environmental quality by promoting appropriate land stewardship strategies and restoration efforts. Educational programs may include interpretive programming, tours, site visits, technical assistance programs and literature distribution via community web sites, newsletters, utility bill inserts, etc.



Conclusion

This inventory documents the many high quality natural lands in the lower Cass River Greenway that still look and function the way they did 200 years ago. Of these high quality sites, some have the potential of harboring endangered, threatened, or special concern animal and plant species. With the rate of local development and its associated stresses on the natural environment, conservation of these remaining lands and their native plant and animal populations is vital if the counties' diverse natural heritage is to be conserved. When using this assessment, it is important to keep in mind that natural land boundaries and rankings 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 action.

Natural resources are a fundamental building block of every city, township, and county. Just as each community has a “gray infrastructure” of streets and utilities, communities also have a “green infrastructure” of the natural systems in and around them.



Recommendations

1] Local units of government using this assessment should consult a publication produced in 2003 by the Michigan Department of Environmental Quality called “Filling the Gaps: Environmental Protection Options for Local Governments.” The publication includes information on tools and techniques to consider when making local land use plans, adopting new environmentally focused regulations, or reviewing proposed development.

2] Municipalities and organizations should identify opportunities to link other possible natural resource sites not mapped during this assessment. 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 natural lands. This fieldwork would provide much needed additional site-specific data that should be considered when developing in and around such areas.

4] All identified natural lands, regardless of their priority, have significance to their local setting. This is especially true in areas that have experienced a high degree of development and landscape fragmentation.

5] A direct relationship exists between natural land protection and long-term water quality. With the abundance of water resources in and around the lower Cass River Greenway and the impact on the economy associated with these resources, natural land protection should be integrated into local water quality management plans.

6] Municipalities and organizations should work together and adopt a comprehensive green infrastructure plan. The conservation of critical natural lands is most effective, and successful, in the context of an overall plan.

7] Funding should be secured to update the mapping and assessment of lower Cass River Greenway’s Natural Lands Inventory every five years.

8] Efforts to conserve natural lands should include on-going site assessment and stewardship.

9] Local units of government and organizations in the lower Cass River Greenway should widely distribute this inventory in order to build awareness and encourage long term resource planning and stewardship.

10] When establishing sites for possible field inventory, each community, group or individual should consider all available criteria in conjunction with their unique local conditions. Site selection may well be influenced by local growth pressure and ownership of the land.



Cass River Greenway

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Frankenmuth, MI 48734

www.cassriver.org

Natural Lands Inventory

Created by the Cass River Greenway
and University Outreach at the
University of Michigan-Flint.