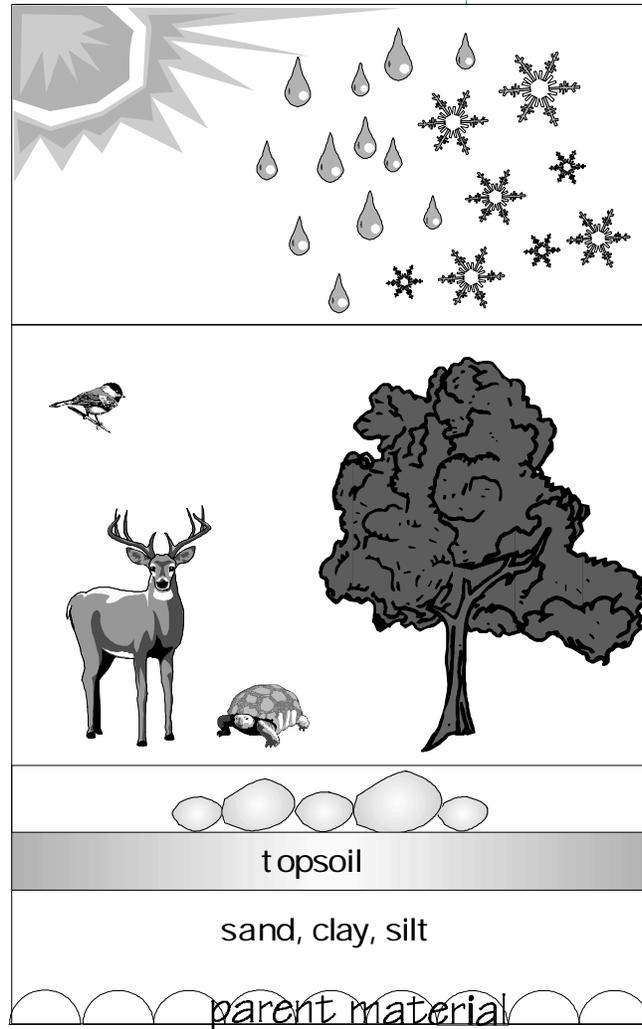


# ECOSYSTEMS, LANDSCAPES, & YOUR PROPERTY



From the large forest tracts of the Upper Peninsula to expansive wetlands of Lake St. Clair, Michigan is a wonderful and diverse place. As a Michigan landowner, your property fits into the big picture, as it is a single piece of the large jigsaw puzzle of the state. Each land parcel, regardless of size, fits with other pieces to form a neighborhood. The neighborhoods then come together and form an ecosystem. Ecosystems collect to form a regional landscape, and these together, in turn, link the State of Michigan with surrounding states and provinces. It is important to understand this concept because what happens on your property--your individual piece of the puzzle--has an impact on your neighborhood, the local landscape, the regional ecosystem, and ultimately the areas surrounding the state. Therefore, the collective set of management practices on a landscape ultimately determines which communities of species will prosper.

"Ecosystem" refers to the relationship between a community of plants and animals and its living and non-living environment. This relationship includes the rain, sun, wind and elements of the atmosphere; the plants and animals, including people, on the land and in the waters; and the soil, geology and water that occurs on or in the land. Interacting together, these diverse environmental factors form an ecosystem. Each ecosystem



Climate, heat,  
and precipitation

Plants  
and animals

Rocks  
and soils

can be defined both as an individual, self-contained complex, and as part of larger ecological systems.

Ecosystems can be as small as several square feet around a fallen log in a forest, or as large as the Great Lakes region. Size of the ecosystem is not nearly as important as the interactions within the ecosystem. The bacteria, fungi, and insects on the log help to

decompose the log into a soil-enriching humus, which some day will support a new tree. The currents and water temperatures of the Great Lakes will impact the growth and location of invertebrates, which will in turn impact the entire food chain, including people. Again, it is the relationships within the ecosystem, and not its size that defines it.

Ecosystems change over time. Even habitats that have been badly damaged or destroyed may restore themselves, or new habitats may be created instead. Part of the process of habitat creation or restoration is the succession of plant communities. For example, a once-bare crop field left fallow for years will first support annual weeds and flowers. Later, perennial plants invade, followed by shrubs and trees, which some day may make a forest. Natural disturbances may also cause the succession to move backwards, such as a fire returning a forest to bare ground.

As lakes age, over thousands of years, they may fill with sediments and grow warm and shallow. Eventually cattails and other wetland plants may invade, and the lake could become a marsh, or swamp. Someday, it may turn into upland habitat and may later support a forest. Nothing remains static in the world, and that is why the composition of ecosystems are always changing.

## Michigan's Four Regional Landscapes

Many observers think of ecosystems as a hierarchical arrangement, where one system fits naturally within another. For example, the rotting log ecosystem may be part of a larger complex of lowland evergreens, embedded in a northern hardwood forest ecosystem, which stretches from Wisconsin to the southern Michigan ecosystem, all of which are modified by the Great Lakes ecosystem. Taken logically to its conclusion, Planet Earth is an ecosystem. There are other ways to look at this fascinating phenomenon, too. Looking at cover types or wildlife habitats, for example, offers another lens through which to view ecosystems on the scale of landscapes. In this way, ecosystems can be wetlands, woodlands, grasslands, brushlands, or farmlands.

Ecosystems also vary geographically. In Michigan, each part of the state is dominated by different landscapes, each of which functions differently, and will respond differently to management. Biologists and ecologists have divided Michigan into four major geographic landscapes: the southern Lower Peninsula, the northern Lower Peninsula, the eastern Upper Peninsula, and the western Upper Peninsula. Below is a



brief description of each region to help you understand how your property fits into these bigger pictures.

### Southern Lower Peninsula

Southern Michigan is characterized with a warmer climate and a longer growing season than elsewhere in the state. This region receives more precipitation in spring than in fall, with total amounts more variable than other regions of Michigan. The geology of this region is soft limestone covered by glacial deposits. The topography has an elevation of less than 1,200 feet and features low, flat plains with hilly areas in the southwest and also along a line from Hillsdale to Lapeer. Predominant soils include loams and clays in variations of dry or wet environments, and sandy soils near Lake Michigan and near hilly areas.

Prior to European settlement in the southern Lower Peninsula, oak-hickory forest, beech-sugar maple forest, oak-savanna, wetlands, and deciduous swamps were the dominant land types. Today, agriculture, homes, businesses, and roads have replaced most of these original land types. Scattered woodlots remain mainly in areas with moist or wet soils, which are harder to



drain and convert to other land uses. In many areas over half of the pre-settlement wetlands have been drained, and a few isolated oak-savannas remain.

## Northern Lower Peninsula

Even though the geology of this northern area is similar to southern Michigan, with its soft limestone bedrock covered by glacial deposits, the climate, soils and cover types begin to change north of a line from Muskegon to just north of Bay City. This line marks a transition or "tension zone" that separates the Lower Peninsula into north and south ecosystems. The topography of the northern lower peninsula is mainly hilly with elevations as high as 1,600 feet, but features relatively flat areas in the central portion and along the eastern Lake Huron shoreline. The climate of this region is cooler and more variable than in southern Michigan.

still covered with forest, although in some areas agriculture and homes have replaced the forest. Also, because of past and present timber harvest methods, there has been a rapid increase in aspen across the region. There has also been a conversion of conifer swamps into swamp brushlands.

## Eastern Upper Peninsula

This area is characterized by limestone and dolomite bedrock, which is softer than the underlying deposits of the western Upper Peninsula. The overall flat eastern end is characterized by elevations under 800 feet and climates that are greatly influenced by the Great Lakes. The frost-free period and the growing season are short compared to southern Michigan. Major soil types in this region are wet sands, clays, and organic soils.

Prior to European settlement, the region was covered with northern hardwood forests, conifers, conifer-hardwood swamps, aspen-birch, peatlands, and vast marshes along the Great Lakes. Today, many of the Great Lake marsh-

es have been  
lost,  
some  
forest  
areas  
have been  
converted to

agriculture, and areas once supporting mixed pine have been converted to red pine plantations.

## Western Upper Peninsula

In the western Upper Peninsula, the underlying hard and erosion-resistant bedrock of granite is responsible for the area's rugged, hilly terrain, which includes the only mountainous area in Michigan. Elevations in the Huron and



Porcupine mountains reach more than 1,800 feet. The climate is less influenced by the Great Lakes, as it is impacted more by the inland land bases of Wisconsin and Canada. The winters are very cold due to northern winds that are not buffered by the Great Lakes. Predominate soils in this region include loams, thin loam over bedrock, clay and wet clay. This area receives more precipitation than the eastern Upper Peninsula.

Prior to European settlement, the western Upper Peninsula was dominated by northern hardwood forests, jack pine and red pine-jack pine forests, and shrub and conifer swamps, and bogs. Today, much of this area is still forested, though present timber management methods have reduced the forest diversity.

## Looking at Local Landscapes

To understand how your property fits into the landscape as a piece of a puzzle, you must imagine a bigger picture. If you have become familiar with your land by taking inventory during walks (see the chapter on **Evaluating the Land** in the Habitat Planning section for information), you may already have an understanding of how the pieces of your property fit together. This understanding can be obtained by asking yourself a few questions about the surrounding areas. What is the landscape in your neighborhood, township, and

Prior to European settlement in the northern Lower Peninsula, the major cover types were northern hardwoods, oak-pine barrens, pine forests, and conifer swamps. Today, this regional landscape is

county comprised of? Is it mostly woodlands, grasslands, wetlands, or brushlands? Are certain areas large or small? Are they being farmed, and if so, how?

You can further your understanding of the landscape by observing what species are seen there. The type of wildlife you see in your part of the county is determined by habitats in your local landscape. When travelling to places that surround your property, if you see pheasants, bobolinks, and meadowlarks, the landscape most likely is comprised of grasslands. The presence of ruffed grouse, scarlet tanagers, least flycatchers, or snowshoe hares indicates that landscapes are probably more forested. Agricultural landscapes often support American kestrels, killdeer, and woodchucks. Brushland habitats attract ruffed grouse, indigo buntings, deer, and cottontail rabbits. And in areas where you see ducks, geese, herons, grebes, or kingfishers, the landscape is mostly wetland-related.

The general habitats in your area can provide you with guidance on the types of wildlife you are most likely to attract with habitat projects on your land. For example, if your property is in southeast Newaygo County, the local landscape is comprised of oak forest with a scattering of old fields. Historically, this area was comprised of oak forest, oak-pine forest, and white pine-hardwood forest mixed with prairies. You could manage your woodlands for oak by

adopting specific timber-management recommendations. Further, you could manage old fields as tall-grass prairies. These decision might help you to attract deer, wild turkeys, and grassland and woodland birds as well as the rare Karner blue butterfly.

Now that you have an idea how your property fits into the bigger picture, you can also look more critically at the types of habitat on the land next to yours and the parcels that make up the neighborhood. Wildlife species do not understand human or political boundaries such as property lines, roads and counties. By evaluating your neighbors' land and surrounding properties, you can get an idea as to which wildlife habitat components are available and which are missing. In conjunction with the land next to yours, and in the extended neighborhood, you may be able to provide all of the habitat components that are necessary. Perhaps you and your neighbors can manage these shared habitats for a common goal.

In summary, ecosystems involve relationships between plant and animal communities and their environments. For this reason, everything in the natural world is part of an ecosystem. No ecosystem stands alone, as it is part of a larger natural order to which it both contributes and is dependent upon. Learning to look at how your property fits into local neighborhoods, area landscapes, and regional ecosystems will help you to develop wildlife habitat goals that will be

successful. By taking such an approach you will be able to more easily attract and benefit wildlife. Understanding and appreciating your part of the big picture will help wildlife on your land and beyond.

**FOR ADDITIONAL CHAPTERS CONTACT:**

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**Private Land Partnerships:** This partnership was formed between both private and public organizations in order to address private lands wildlife issues. Individuals share resources, information, and expertise. This landowner's guide has been a combined effort between these groups working towards one goal: Natural Resources Education. We hope this guide provides you with the knowledge and the motivation to make positive changes for our environment.

FOR ADDITIONAL ASSISTANCE: CONTACT YOUR LOCAL CONSERVATION DISTRICT