Iowa's Biological Communities Series
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Iowa’s natural beauty has long been a great factor in drawing people to the state. But there is more to that beauty than meets the eye. To assist Iowa educators in teaching their students about the complexities of Iowa woodlands, wetlands, waterways, and prairies, the Iowa Association of Naturalists has produced a series of booklets which offer a basic, understandable overview of Iowa biological communities. The five booklets in this series are:

Iowa’s Biological Communities (IAN-201)
Iowa Woodlands (IAN-202)
Iowa Prairies (IAN-203)
Iowa Wetlands (IAN-204)
Iowa Waterways (IAN-205)

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Iowa’s Biological Communities is one in a series of five booklets that are part of the Iowa’s Biological Communities Series. The booklets in the series include:

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The Iowa Association of Naturalists has produced six other booklet series that provide readers with a clear, understandable overview of topics concerning the Iowa environment and conservation. The booklets included in each of the other five series are listed below.

**Iowa Physical Environment Series**
- Iowa Weather (IAN-701)
- Iowa Geology and Fossils (IAN-702)
- Iowa Soils (IAN-703)

**Iowa Wildlife Series**
- Iowa Mammals (IAN-601)
- Iowa Winter Birds (IAN-602)
- Iowa Nesting Birds (IAN-603)
- Iowa Reptiles and Amphibians (IAN-604)
- Iowa Fish (IAN-605)
- Iowa Insects and Other Invertebrates (IAN-606)

**Iowa’s Natural Resource Heritage**
- Changing Land Use and Values (IAN 501)
- Famous Iowa Conservationists (IAN 502)
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- Keeping Iowa Wildlife Wild (IAN-402)
- Misconceptions About Iowa Wildlife (IAN-403)
- State Symbols of Iowa (IAN-404)
- Iowa Food Webs and Other Interrelationships (IAN-405)
- Natural Cycles in Iowa (IAN-406)
- Iowa Biodiversity (IAN-407)
- Adapting to Iowa (IAN-408)

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- Iowa's Summer and Fall Wildflowers (IAN-302)
- Benefits and Dangers of Iowa Plants (IAN-303)
- Iowa's Trees (IAN-304)
- Seeds, Nuts, and Fruits of Iowa Plants (IAN-305)
- Iowa’s Mushrooms and Other Nonflowering Plants (IAN-306)
- Iowa’s Shrubs and Vines (IAN-307)

**Iowa Environmental Issues**
- Iowa Habitat Loss and Disappearing Wildlife (IAN-101)
- Iowa Air Pollution (IAN-102)
- Iowa Water Pollution (IAN-103)
- Iowa Agricultural Practices and the Environment (IAN-104)
- People, Communities, and Their Iowa Environment (IAN-105)
- Energy in Iowa (IAN-106)
- Iowa Waste Management (IAN-107)

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Iowa was once covered by vast prairie grasslands and open savannas. Thick woodlands bordered the many rivers and streams. A large variety of wildlife lived in Iowa’s prairies, woodlands, wetlands, and waterways. But Iowa’s landscape has undergone drastic changes in the past 150 years. Natural biological communities have been greatly reduced and replaced by farms, towns, industries and roads. The prairies and wetlands are nearly gone, and rivers and streams have been greatly changed to meet human demands. And less than a third of Iowa woodlands remain.

**Formation of Iowa’s biological communities**

A biological community is more than a place with grasses or trees. The community includes all the living things - their interactions and diversity. As Iowa’s woodlands, prairies, wetlands, and waterways became established, a variety of plants and animals became adapted to the special, evolving characteristics of each ecosystem. Climate, soils, topography, and moisture made each a special place. When European settlers arrived in what is now Iowa, they encountered vibrant biological communities with astounding plant and animal life.
Iowa’s biological communities became a part of our modern landscape following the retreat of the most recent glaciers that covered much of Iowa 10,000-14,000 years ago. In the region of north and central Iowa known as the Des Moines Lobe, glaciers flattened and scraped the landscape, leaving behind numerous depressions filled with water. Left behind were thousands of wetlands of various sizes. Streams slowly meandered through the flat terrain.

Where recent glaciers did not flatten the landscape, streams have cut well-defined beds in the land. In these older landscapes, rocky ledges and stone cliffs sometimes border the waterways. The gently rolling hills and deep river valleys of southern Iowa are part of an older landscape. The Northeast Iowa Driftless Area is the oldest landscape in Iowa. Cool water rushes and tumbles over rocks and gravel down steep slopes in this hilly region.

The climate began to warm as the glaciers retreated. A prairie ecosystem, dotted with small prairie marshes called potholes, began to dominate the state. Dense root systems and the ability to survive fire allowed prairie plants to hold their ground in the drier climate, excluding most trees and other woody plants. Iowa’s woodlands were, for the most part, restricted to areas where more moisture was available.
A state of change
Woodlands, prairies, wetlands, and waterways are dynamic biological communities. Each exists in a constant state of change. A predictable series of changes in vegetation over time is commonly referred to as succession. Each stage of succession provides different types of habitat for plants and animals.

A woodland may begin as a grassland, pasture, or parcel of disturbed land. A few shrubs and grassland-adapted trees begin to grow in the area. Next, the land is covered by a thick woodland growth of fast-growing trees and shrubs that is difficult to walk through. The climax vegetation, or old-growth, for a typical Iowa woodland has very large, leafy trees that shade out much of the woodland floor. The process moves back and forth between stages, making woodlands dynamic with changes in plant and animal life.

Prairies also change over time. A thick mat of plant litter slowly accumulates and slows the growth of prairie plants. These dense prairies do not offer wildlife enough space to move around, find cover, and locate food. In the absence of fire and left unmanaged, a prairie area may slowly be taken over by shrubs and trees.
There is also a cyclical process of succession in a wetland marsh. In the **open water stage**, when a basin is full of water, the common plants are often submersed underwater. Usually within 20 years, there comes a period of drought and the wetland becomes a **dry marsh**. Seeds of emergent plants sprout in the exposed soil and, when rainfall returns, the wetland is transformed into a **dense marsh** of cattails and reeds. The next stage, called the **hemi-marsh** stage, has the most diversity of plants and animals and occurs when emergent plants become fewer. This stage is characterized by having approximately as much emergent growth as open water. With normal rainfall and continued loss of emergent plants, the marsh returns to the **open water** stage and the cycle continues.

Rivers and streams are also constantly changing. If a person stands on a bluff bordering the Mississippi River in eastern Iowa and looks to the east, he or she will see a broad, flat floodplain separating the hills of Iowa and Illinois or Wisconsin. This floodplain was formed over many years as the Mississippi River grew and shrank, meandered and formed oxbows. Large rivers and streams often form these wide wetland floodplains.

Natural disturbances and human activity affect changes in biological communities and wildlife habitat. Succession in a woodland may be interrupted many times by disturbances such as fire, clear-cutting, wind storms, disease epidemics, or human woodland management techniques. In a prairie, fire, grazing, mowing, and haying affect succession. Floods, dams, channelization, periods of drought, muskrat activity, and wetland draining or filling all affect the natural, cyclical changes of a wetland. Dams, channelization, erosion, pollution, and rainfall may be forces that change rivers and streams.
Iowa’s woodlands were historically found in areas sheltered from direct sunshine and strong winds where more moisture was available. In these areas, trees could establish themselves and outcompete grasses that covered most of the state. Iowa rivers and streams were bordered by a thick woodland corridor. The eastern, southern, and especially northeastern parts of Iowa were more heavily forested than the rest of the state. Today there are fewer woodlands, but they still favor the same climate and maintain the same general distribution. Iowa’s biological communities have all been greatly reduced, but woodlands are by far the most common of Iowa’s remaining biological communities. Approximately 28 percent of Iowa’s original forest cover remains.

**Woodland plants**

A large variety of trees, shrubs, vines, and flowers may be found growing in Iowa woodlands. These plants are characterized by growing in either upland or bottomland woodlands, although they may overlap. **Upland woodlands** are most often found on hilltops and drier south and west slopes. They often contain large oaks and hickories – trees better adapted to sunlight and drier conditions. When these trees grow large, their leafy canopies shade the forest floor. Shade-tolerant sugar maples and basswoods sometimes take over areas previously covered by oaks and hickories.

Along streams and on more damp north and east sides of slopes are Iowa’s **bottomland woodlands**. Ravine bottoms often contain cottonwood, silver maple, and green ash trees, with basswoods growing on hillside slopes and willows bordering stream banks.
**Savannas** are areas composed of a mixture of mature woodland and grassland vegetation. The most common savanna tree is the burr oak, which has a deep tap root and thick bark, well-adapted to surviving hot prairie fires.

The heavily wooded **Driftless Area** in Northeast Iowa contains native red cedar, white pine, balsam fir, and prostrate juniper—evergreens that are more common in Minnesota and Canada but rarely native in the rest of Iowa. A very rare and unique type of habitat is found in these woodlands. Ice caves and cold air slopes are found here, and are homes for endangered plants and animals.

Forest plants grow in layers. Smaller understory trees and shrubs grow beneath large canopy trees. Most Iowa woodlands once were pastured, and thorny bushes and other plants not eaten by cattle are now common in our woodland shrub layers. Examples include gooseberries, raspberries, honey locust, hawthorn, and prickly ash. Many vines, such as Virginia creeper and wild grape, climb on trees and shrubs and on the woodland floor. A woodland vine to be aware of is poison ivy. It is very common, especially in our floodplain forests.

Early in spring, woodlands come to life as small patches of color poke up through the litter of dead leaves and fallen twigs. These first flowers of early spring are called **ephemerals** because they are short-lived, and are some of the most beautiful and numerous of the woodland flowers. Bloodroot, hepatica, and Dutchman’s breeches bloom before big trees form their thick canopy that shades the woodland floor. These flowers are followed by many others, including May apple, Virginia waterleaf, and columbine. To find out more about identifying Iowa’s beautiful woodland wildflowers, refer to a field guide.
Woodland animals
From the high canopy of an Iowa woodland, a few of Iowa’s most fascinating birds may search the landscape for their food. Hawks use high treetops for nesting or perching, and hunt as they soar above woodland edges. Within the woodland, owls perch or nest in the canopy as they listen quietly in the still night for the movements of their prey. The understory may appear to be a circus trapeze act of flying songbirds, leaping squirrels, and climbing woodpeckers. Look for leafy squirrel nests in the treetops and woodpecker holes in standing dead trees.

For much of summer, woodland shrubs are the grocery store of an Iowa woodland. A variety of small birds dart in and out of shrubs, eating berries and insects and taking advantage of thick shrub cover for shelter. Deer browse on leaves in the shrub layer, well-protected among thickets.

Chipmunks and mice scurry among rocks and logs of the woodland floor in search of fallen nuts, seeds, and berries. Toads stay in the moist woodland floor and eat crickets and other crawling or low-flying insects. Snakes and gray foxes hunt for smaller animals that seek concealment among low-growing plants. Raccoons, opossums, and skunks prowl for small mammals and invertebrates, and fallen nuts, seeds, and berries.

The strange world of the woodland basement is home to a variety of obscure invertebrates. These small creatures may have no eyes or many eyes, a hundred legs or no legs, antennae, hairs, slime, or any combination of characteristics. Many important decomposition animals such as ants, pill bugs, and larval insects live in the woodland basement. Tunnels crisscross under the ground and reveal the movements of moles.
Prairies once dominated the Iowa landscape. Approximately 85 percent of Iowa was covered by a mixture of prairie grasses and flowers. Wetlands dotted the prairie landscape, and a large variety of wildlife lived in Iowa’s prairies and prairie wetlands. When European settlers first encountered the prairies of Iowa, they had difficulty finding words to express what they saw. The vast sea of grasses and flowers had no counterpart in Europe. “Prairie,” the French word for “meadow,” was adopted to describe the awesome spectacle which first greeted settlers as they moved west out of the eastern forests.

**Prairie plants**

Whereas trees dominate and define a woodland, grasses dominate and define a prairie. In general, tall grasses and sedges are found in moderate to damp soils and shorter grasses are more common in dry or sandy soils. At least 72 species of grasses are known to grow in Iowa’s prairies.

Vast areas of the Iowa prairie, especially in the prairie pothole region, were historically damp and contained many wetlands. These are the areas where the tallest grasses grow. Tall grasses, including big bluestem, Indian grass, and switch grass, are common in many prairie areas. Wetter areas contain sedges and other wetland plants. Shorter grasses, such as little bluestem, sideoats grama, and tall dropseed, are more typical of dry or sandy prairies and historically were less common in Iowa.
Prairies are more than a sea of grasses. They are places of beauty, filled with the colors of showy flowers. A parade of prairie wildflowers begins in April and marches through to October. Prairie wildflowers have adapted to life in an environment in the open, exposed to sun and wind. Although certain plants may be better adapted to drier or wetter conditions, prairie wildflowers can be found growing in all types of prairies.

**Prairie animals**

Although a sea of grasses may identify a prairie at a glance, prairie animals are an integral part of an Iowa prairie. There are areas scattered throughout the state where people have planted various grasses and a wildflowers in an attempt to demonstrate what a prairie may have looked like. Appearances aside, however, in a real prairie community, plants and animals interact to make a biological community that is diverse and complex.

Animals depend on prairie plants and other prairie animals and often use specific types of prairies. Historically, Iowa prairies contained a large variety of wildlife specially adapted to life in the open grasslands. Bison, elk, and wolves once lived in Iowa. It is unlikely that prairie dogs or black-footed ferrets ever lived in Iowa, but they were common in the western shortgrass prairies. Tall grasses and loamy soils provide a home for smaller mammals such as pocket gophers, ground squirrels, grasshopper mice, and badgers.
In winter, prairie plants provide a durable one to three-foot cover to ward off snow and cold winds. In spring, the bunchy growing pattern of grasses provide areas of concealment as well as bare areas where birds can dust themselves and move about more freely in search of food. Meadowlarks, bobolinks, nighthawks, and grasshopper sparrows feed on insects and keep insect populations in check. Above, larger birds such as red-tailed hawks, northern harriers, and American kestrels survey the open prairie landscape, looking for their prey. Where a wetland is nearby, garter snakes and bull snakes hunt for frogs, mice, and other small animals. Chorus frogs and American toads feed on numerous insects. An occasional box turtle may make its burrow in a sand prairie. Skinks move quickly through grasses of dry prairies.

In insects are very important to prairies. Not only do they pollinate flowers, but they are also the basis for many prairie food chains. Prairie mammals, birds, reptiles, and amphibians all feed on abundant insects. Countless multitudes of ants aerate and mix the rich prairie soil. Insects are the center of life on the prairie.

As vast prairies were converted to farms, towns, and roads, some wildlife species vanished from Iowa. Iowa’s remaining prairie wildlife are confined to small prairie remnants and restored prairie areas. Plants and animals that require rare or very specific prairie conditions often are missing from these prairie pieces. Wildlife species with general needs adapted to life in road ditches, pastures, and other areas of human development.
Wetlands are places with standing water or saturated soils where plants and animals live. They sometimes are called swamps, sloughs, potholes, marshes, bogs, fens, seeps, oxbows, shallow ponds, or wet meadows. Each of these wetland types has unique characteristics. Iowa’s wetland marshes were most common in north and central Iowa, in the area known as the Des Moines Lobe. This area, sometimes called the “thousand-lake” region by pioneers, was a 7.6 million-acre area of vast prairies dotted with thousands of pothole wetlands. Many were only seasonally wet.

The once numerous wetland marshes that were the result of glaciers, are called palustrine wetlands. Other types of wetlands also exist in Iowa. Lacustrine wetlands include both open lake water and the shallow edges of lakes. Backwaters of the Mississippi River and other rivers and streams sometimes have associated riverine wetlands. Wet areas where groundwater comes to the surface are called seepage wetlands. Fens are seepage wetlands where alkaline water rises to the surface. Bogs are wetlands that have acidic, peat soils.

Wetlands are among the most diverse of all natural communities in Iowa. Plants and animals fill every wetland niche. Wetlands are also important regulators of the environment, filtering sediment and organic waste from runoff and lessening impacts of floods or droughts.

In a river or stream community, animals and plants make their homes in moving water.
There is both an abundance and diversity of waterways in Iowa – the great Mississippi and Missouri border rivers, the flat meandering streams found throughout most of the state, and the cold, clear, quick waters of northeast Iowa. A person traveling in Iowa is rarely more than 30 minutes from a waterway. However, nearly all Iowa waterways have been altered to meet demands of agriculture, industry, and development. Many of the once vibrant waterway communities have been destroyed directly or indirectly by these changes.

Wetland plants

If a person jumped into the middle of a typical wetland pond, she would land in open water. **Submersed plants**, such as sago pondweed and coontail, would tickle her legs as she walked through the pond muck toward land. Soon she would find herself surrounded by numerous **free-floating** plants, such as tiny duckweeds. As the water became shallow, she would need to push away the lily pads and other **large-leaved floating plants**. A thick growth of **emergent plants** such as reeds and cattails would mark the beginning of the emergent wetland community. When she broke through this dense vegetation, she would step into a **wet-meadow community** of sedges, grasses, and flowers such as smartweed, swamp milkweed, and marsh marigold. The ground would be lumpy and difficult to walk on, and could be either wet or dry depending on the time of year and recent rainfall.

Iowa’s slow-moving streams often contain many of the same plants common in marshes, ponds, and lakes. In faster-moving cold water, plants such as watercress stay anchored in the current by “grabbing on” by their roots. Algae and mosses are periodically torn from their homes, but quickly recolonize once the current slows.
Wetland animals

Many animals, from tiny “water fleas” to great blue herons, make Iowa wetlands and waterways their home. Water plays a critical role in the life cycle of Iowa wildlife – providing areas for breeding, raising young, gathering food, and migratory rest stops. For many birds, insects, and amphibians, periods of their life cycle require wetlands or waterways.

Beaver are typically a stream animal, but the dams they build create backwaters and shallow ponds. Muskrats are also important wetland mammals. They use a tremendous amount of wetland plants for their food and to make their domed, cattail lodges. The population of muskrats often determines the amount of open water in a wetland. Other mammals, including minks, opossums, raccoons, and deer, leave their tracks in the wet soil of the stream bank.

Birds are common in wetlands and along waterways. Killdeer may be seen on nearly every dry sand bar. Great blue herons wade in the shallow waters and use their long beaks to probe for frogs, fish, and other small animals. Flycatchers gobble up the tremendous number of flying insects. Red-winged blackbirds and bitterns find refuge and food in dense stands of reeds and cattails. Above wetland waters, a northern harrier may scout for small animals which make up its prey. Kingfishers and gulls dive down to snatch fish from rivers and streams. In winter, bald eagles are common along larger rivers where they use their sharp talons to snatch fish.
Iowa’s pothole wetlands are part of the huge prairie pothole region that stretches into Minnesota, the Dakotas, and parts of Canada. This vast area of prairies and marshes has historically been the most important nesting ground of ducks and geese in North America. Mallards, wood ducks, and blue-winged teal are common nesting ducks in Iowa. In addition to spring nesting areas, Iowa wetlands are situated along the Central Flyway and provide rest stops for migrating waterfowl. The Mississippi and Missouri Rivers are the most important interior flyways for migrating waterfowl in North America. Common migrants include pintails, green-winged teal, shoveler’s, lesser scaup, redheads, and ruddy ducks.

Amphibians are biologically linked to water. Their life cycle and physical adaptations bind them to a damp existence. Many reptiles are also dependent on water. Cool water and reflected sunlight allow cold-blooded animals to easily regulate their body temperature by either swimming or sun bathing. More than 75 species of reptiles and amphibians depend on wetlands and waterways in Iowa.

Small, strange-looking creatures fill every nook and cranny of wetland and stream communities. In open waters, insects such as water boatmen and backswimmers feed on plants. Water scorpions, predaceous diving beetles, and giant water bugs are predators that search the waters for zooplankton, other insects, and even tadpoles and larger crustaceans. Water striders and whirligig beetles skitter along the water’s surface. Fish spiders, buoyed by their water-repellent hairs, can walk on water as they scavenge and search for insect prey. The air above the water is also thick with insect life, as dragonflies snatch up swarms of gnats, flies, and mosquitoes.
**Fishy waters**

Warm, shallow water, often low in oxygen and high in plant life, is typical of wetlands and most Iowa streams. Some fish are well adapted to Iowa’s broad, shallow waters – as long as they are not too warm or polluted. Warm, shallow wetlands usually do not contain fish.

Bluegills and black crappies find cover and nesting structure in weedy wetland shorelines. Largemouth bass wait among the plants for the opportunity to catch an unsuspecting frog, crayfish, or small fish. Populations of bluegills, crappies, and bass are all limited in wetlands by warm water and low oxygen levels. Bullheads, however, are one of the most numerous wetland fish, and can live in the warm, low-oxygen water of Iowa wetlands. These smaller relatives of catfish have long whisker-like *barbels* that act as antennae as the fish search the dark wetland bottoms for plants or animals – dead or alive. The barbels even contain taste buds that allow the fish to taste their food before biting.

Bluegills, crappies, bass, and catfish are all considered *sport fish* and are highly sought by Iowa anglers. Less common sport fish in Iowa waters include northern pike, walleyes, and stocked trout, found only in cooler, clearer streams. Native trout are rare in Iowa. **Rough fish**, such as small minnows, shiners, and chubs, are less sought by anglers, but are critical to the food chains that support larger fish. Various carp and suckers are also considered rough fish, although some may weigh more than 80 pounds.
A dark, quiet woodland

Woodlands are dark places. Keen eyesight is an unnecessary tool where sight is limited to the next nearby bush or tree. Woodland animals, especially mammals, have acute senses of hearing and smelling. Most are active at night, when the woodland is especially dark and quiet. Gray foxes may listen near burrows for the movements of underground chipmunks or mice. Owls sit quietly and listen for the movements of their prey on the forest floor. Most woodland animals “freeze” when danger approaches, instantly blending in with the thick, dark woodland vegetation.

Woodland plants living in these dark and quiet places have evolved strategies to take advantage of sunlight while it is available. Each spring there is a succession of growth, beginning at the woodland floor and progressing to the canopy. It is a race to flower and make seeds before the leaves of higher layers shade the lower layers. Wildflowers and shrubs begin to blossom and turn green before the understory trees leaf out. Once the canopy becomes leafy, the search for sunlight becomes difficult. Smaller trees may bend and stretch for sunlight. Vines use trees as a trellis to climb toward sunlight.
Life in the open prairies

In contrast to woodlands, Iowa’s prairies are open, dry, and windy places. Grassland vegetation provides cover for birds and small animals to conceal themselves. But large animals, such as bison, elk, and antelope, cannot hide in the grasses. These animals have developed several strategies to cope with life in the open. They are alert to approaching danger and able to outrun or defend themselves against would-be predators. They are equipped with excellent eyesight, hearing, and sense of smell. They also live in herds, which offer protection to young animals, allow individuals to alert each other to danger, and create confusion when the herd is chased and scattered.

Prairie plants need to cope with extremes of heat and cold. They grow under direct sunlight, constantly losing moisture to the sun’s heat and ever-present prairie wind. Prairie plants keep their exposure to these elements at a minimum. Most grasses have leaves that are finely divided, vertical, and slender. Some plants roll up their leaves, and others have fuzzy hairs that further protect them from losing moisture. Plants such as prickly pear cactus and yucca are more common in desert conditions, but are also found in some Iowa prairies. These plants have sticky plant juices that are less likely to dry out. Prairie plants make use of free prairie winds and the abundance of prairie insects to pollinate their flowers and spread their seeds.
A wet way of life

For plants and animals living in water, getting enough oxygen requires some ingenious adaptations. Emergent plants rooted in deoxygenated wetland muck must get all their oxygen through pores in their leaves and stems, or, in the case of submersed plants, directly from oxygen dissolved in the water.

Fish and some invertebrates have gills that “breathe” dissolved oxygen from the water. Animals without gills use more unusual means for getting oxygen. Like miniature deep sea divers, whirligig beetles and backswimmers carry a bubble of air with them. Worms, leeches, and even frogs and salamanders can absorb dissolved oxygen through their skin. Turtles and some other reptiles are able to absorb oxygen while hibernating in the wetland muck. Mammals living in water must breathe air, but they can hold their breath for a long time.

Animals and plants battle a constant current as they move or remain stationary in a swift-moving stream. Most stream animals are streamlined, helping them propel through the water with little resistance. Smaller animals and some plants find quiet places out of the current. They crawl or swim beneath or behind rocks, dig under sediment, or find refuge in small eddies and pools. Plants, such as watercress, stay anchored in the fast current by “grabbing on” to small rocks with their roots.
The web of life

In a healthy community, there are enough food sources, predators, and space to keep populations of plants and animals healthy. Plants are the primary producers of food that fuels food chains. Grasses and leaves fuel land food chains, and algae is the most important primary producer of food in the water. Mice, rabbits, insects, turtles, and other wildlife feed on the plants and then become food for other animals. Predators such as shrews, spiders, turtles, and snakes feed on this prey, and may in turn also become prey. Cougars, wolves, and bears once sat atop Iowa food chains, but these large predators no longer live in Iowa. Natural predators now atop the food chain include coyotes, owls, hawks, and an occasional bobcat or badger. Without a proper balance of predator and prey species, overpopulation and overcrowding can lead to starvation and disease epidemics among wildlife populations.

Eventually all plants and animals in a community die, and it is the role of various plants and animals, such as scavenging insects and fungi, to help decompose and return these organisms to the soil, refueling the food chains. Food chains combine to make an intricate food web. Within the dynamic food web, animals are provided with a variety of food choices, including foods to fall back on in times of emergency. The web creates health and stability within each community.
In less than a century of settlement, most of Iowa’s natural communities vanished. Prairies, largely ignored by early pioneer farmers, were later found to provide the most fertile agricultural land, and have been impacted the most. By 1900, the Iowa prairie was essentially gone. Scientists estimate that no more than 30,000 acres of prairie exist in Iowa, much of which is tucked away along railroad rights-of-way, in old cemeteries and prairie pastures, in road ditches, around a few remaining pothole wetlands, and on the slopes of the Loess Hills in western Iowa.

In a hundred-year period, from 1850 to 1950, approximately 95 percent of Iowa’s wetlands were destroyed and converted to farmland, roads, and towns. Palustrine wetlands were impacted the most. Only about one percent of the once abundant prairie marshes remains today. Channelization took curves out of rivers and erased bordering wetlands. Tiling removed water from wetlands and revealed fertile cropland soils.

Iowans have selectively saved more woodlands than prairies or wetlands. Approximately 28 percent of Iowa’s original forest cover remains. But these forests are often fractured into small pieces, split by roads, farms, and towns. And Iowa forests are usually affected by human activity. Although some types of wildlife thrive in this fragmented woodland environment, many do not.

Native prairie plants can sometimes be found growing in Iowa roadsides. During the past 15 years, prairie roadside management has resulted in an increase in prairie plants along Iowa highways.
Dams along rivers and streams create habitat for lake wildlife, but may act as barriers to migrating fish and create reservoirs that collect silt. When a waterway is channelized, many miles of stream may be lost. Less than half the original inland waterways are left. Destruction of adjacent wetlands has also played a part in altering river habitat, by speeding the removal of water from the land and quickening the current of the rivers. A loss of plants bordering a stream leads to warmer, shallower waters, as shading trees and shrubs are removed and the water is exposed to the sun’s heat and evaporation. At the same time, sediment and chemicals from the eroding land has a direct route into the waterway.

Preserving the pieces
Iowa’s remaining natural communities rest largely in the hands of private landowners. Only about 10 percent of Iowa’s remaining forests and prairies, and up to 90 percent of our prairie marshes, lie in the public domain. These public lands add up to about two percent of the total land area of Iowa.

People need to recognize the value of woodlands, prairies, wetlands, and waterway communities, and protect the small pieces that remain. Whereas these areas are valuable for wildlife, they also provide recreation and economic benefits for people. The vast root systems of prairie plants are responsible for creating Iowa’s fertile soils – the basis of our economy. Wetlands provide free water treatment services – filtering sediment and chemicals from runoff that would otherwise enter a stream or lake. Wetlands and woodlands bordering streams help control erosion. Sawmills, veneer mills, pulp mills, pallet plants, and

When soil erodes from the land and into a waterway, it creates sediment pollution.
millwork operations supply jobs provided by woodlands. According to the Iowa Society of American Foresters, Iowa’s forests contribute more than $800 million each year to the state’s economy.

Wild plants and animals continue to be sources of medicines, foods, materials, and recreation. Hunters, anglers, canoeists, trail walkers, nature photographers, and others make biological communities the source of their recreation.

Iowans realize the special value of natural communities, and many are working to rebuild natural habitat throughout the state. It is not possible to restore the vast biological communities that once existed in Iowa, but it is possible to re-create places for some native plants, provide habitat for Iowa wildlife, and restore and maintain the fertility and health of natural communities, at least on a small scale. Concerned groups and individuals are rebuilding habitat in Iowa – by planting trees and grasses, restoring wetlands, and protecting remaining natural areas.

**Managing the pieces**

Biological communities are special and need to be carefully managed in ways consistent with their natural features. Modern prairie management techniques imitate the natural role of fire and grazing bison to maintaining the prairie environment. Forest management varies greatly depending on the goals of the land manager, but focuses on selective thinning or clear cuts, replanting, and care and protection of trees. Water quality protection and erosion control are key to managing wetlands and waterways.
Iowa was once a land of vast prairies and abundant wetlands. Rivers meandered throughout the state and were bordered by lush woodlands. Iowa has lost more than 70 percent of its woodlands, 95-99 percent of its wetlands, and nearly all its prairies. Most of the once wild, meandering rivers and streams are no longer wild. The loss of natural communities is a loss of history, aesthetics, wildlife, resources, and environment. Iowa still has some spectacular natural areas, but they are few and may take effort to find.

Each of Iowa’s biological communities contains a special mix of plants and animals that make up the nature of Iowa. Vast prairies, thick woodlands, vibrant wetlands, and meandering streams are Iowa’s natural heritage.

Biological communities affect human communities. Our remaining natural areas preserve wildlife diversity, reduce erosion and water pollution, and provide recreation and economic benefit. People need to carefully manage and protect the state’s woodlands, wetlands, prairies, and waterways to ensure that these special biological communities remain as an important part of life in Iowa.
Useful resources

A Country So Full of Game; James J. Dinsmore; University of Iowa Press, Iowa City, Iowa; 1994.
Forest Statistics for Iowa, 1990 Gary J. Brand and John T. Walkowiak;
IAN Booklet Series; Iowa Association of Naturalists; ISU Extension Service, Ames, IA.
See list of titles and ordering information on page 25 of this booklet.
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“Iowa’s Wetlands”; Richard Bishop; Proceedings of the Iowa Academy of Science (88(1):11-16); 1981.
Landforms of Iowa; Jean Prior; University of Iowa press; Iowa City, IA; 1991
Living on the Edge: Endangered Species in Iowa; Daryll Howell and Mark Leoschke;
Iowa Department of Natural Resources, Des Moines, IA; 1992.
Natural Resource Conservation: An Ecological Approach; Oliver S. Owen;
Prairies, Forests, and Wetlands: The Restoration of Natural Landscape Communities In Iowa; Janette R. Thompson; University of Iowa Press, Iowa City, IA; 1992.
Saving Soil and Wildlife: The Promise of the Farm Act’s Conservation Title;
Wetlands Overview: Federal and State Policies, Legislation, and Programs;
Why Preserve Natural Variety?; Bryan G. Norton; Princeton University Press,