# Iowa's Forests Today

## An Assessment of the Issues and Strategies for Conserving and Maintaining Iowa's Forests

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Iowa Department of Natural Resources
June 2010

# State Forester Comments

The Tauke family arrived in Dubuque in the late 1830s. Their plans to move further west were temporarily placed on hold when the father of the Fangman family they were traveling with suffered a broken leg. Not wanting to separate, the two families sought advice from Bishop Mathias Loras. Bishop Loras advised the families to overwinter in the area near what is now New Vienna. As it turned out there was something about the area that captivated both families and over 170 years later both the Tauke and Fangman families are still "temporarily" in the area.

At the time these families settled in the Iowa Territory it contained slightly over 22,000 settlers and near 7 million acres of woodland. Today the State of Iowa has over 3 million people and slightly over 3 million acres of woodlands. As you will see in our State Forest Resource Assessment and Strategies document the fortunes of Iowa's woodlands have ebbed and flowed since eastern European settlement.

The purpose of this document, which is required by law in the 2008 Farm Bill, is to assess the condition of Iowa's rural and urban forest resources and provide a framework or strategy for how all Iowans might move forward to better care for this resource. The care and stewardship of Iowa's forest resource is critical to providing forest related jobs, forest products, wildlife habitat, erosion control, recreation, energy savings, community cohesiveness and quality water.

While Iowa's forested acres have almost doubled since 1974, the threats to our woodlands have never been greater. Emerald Ash Borer, gypsy moth, bur oak blight, oak tatters and garlic mustard are but of few of the problems that have emerged in Iowa in the last ten years. Threats not yet in Iowa but on the horizon include Asian longhorn beetle, thousand cankers disease and sirex wood wasp.

Generally, the most devastating forest health issues are those that occur slowly over time and therefore are not readily apparent to the majority of individuals. The slow decline in oak forest acres is such an example. Iowa has lost almost 5,800 acres of oak forests annually since 1954. The primary culprit in this loss of oak is not an exotic invasive pest but a lack of vision and foresight in the care of our public and private woodland resources.

I could go on at length about the multitude of forest benefits, forest threats and forest related opportunities. However, these issues are covered in great depth and detail in the following pages of this document that has been so well put together by our Special Projects Forester Aron Flickinger. Instead I would like to share some personal history and a few thoughts.

I grew up on a farm in southwest Dubuque County. To my lasting good fortune this farm, which was owned by my Grandpa Nick Polfer, was nestled up against the east bank of the North Fork of the Maquoketa River and contained 110 acres of woodland. I was fortunate to find time between

helping with haying, cultivating corn, and caring for livestock to wander the timber, follow ravines as they threaded their way to the river, hunt mushrooms and pick blackberries. Time spent in the woods was some of the most enjoyable time of my childhood and one of the great tragedies of modern society is that every child does not have a river and a hundred of acres of woods in which to learn about Creation, nature and themselves.

It is through the woods of my childhood that I came to understand how my ancestors were captivated by the beauty, uniqueness and opportunities afforded by Iowa's forests and landscapes. It is through the woods of my childhood that I have also come to understand my own welcomed captivity to Iowa and Iowa's forest resource.

It is my sincere hope that through this document you will in some small way be captivated by Iowa's woodlands and that you will utilize that captivity to advocate and assist with addressing the many issues, opportunities and threats faced by Iowa's forest resource. If we start working together today, Iowa's forest will be in great shape for the next 170 years and perhaps even in the year 2180 children and adults will have healthy woodlands to roam and will themselves become imprisoned by the many benefits provided by Iowa's woodlands.

Sincerely

Paul Tauke
State Forester

# Executive Summary

The primary goal of the 2010 State Forest Resource Assessment and Strategies document is to use the best available data to elaborate on a variety of issues pertaining to the past, present and future condition of Iowa's forests. The document is divided into nine chapters showing trends and highlighting issues; at the end of the first seven chapters a summary outlining the key points of that particular chapter is provided.

Data for this document was collected from a wide variety of sources, including Forest Service publications, DNR forester experiences, Community Wildfire Protection Plans, Wildlife Action Plans and strategic planning documents. It also contains information based on input from nearly 200 stakeholder groups, including the Iowa Woodland Owners Association, Urban Council, State Forest Stewardship Coordinating Committee, State Wildlife Agency, State Technical Committee, Forest Legacy Program, U.S. Army Corps of Engineers, U.S. Dept. of the Interior National Park Service Effigy Mounds, and U.S. Fish and Wildlife Service.

This document describes forest conditions and trends based on qualitative, quantitative, and geospatial data to provide an analysis of past, present and future forest conditions and trends on all ownership types in Iowa. The first seven chapters discuss specific criteria related to the condition of Iowa's forest resources as well as the importance of trees to Iowa. A section prior to chapter 1 provides some history about European settlement and its affect on the state's natural resources. Chapter 8 shows where priority areas are for rural, urban, forest legacy and multi-state projects. Chapter 9 summarizes the issues that were derived from chapters 1-7 and proposes strategies for how to resolve those issues in the upcoming years.

Geospatial referenced data is provided whenever possible throughout the document. Maps showing priority forest areas are displayed when enough geospatial data is available for a variety of issues. Some issues are not quantifiable using geospatial data but are still priorities that need to be addressed.

Before reviewing the condition of Iowa's forest resource, a comparison of funding priorities for the state is given in the table on the adjacent page. The amount of tax dollars allocated to a particular state department is a direct reflection of the value of that department to lawmakers, politicians and constituents. The Department of Natural Resources represented just 0.34% of the overall state budget in 2008, and the department experienced further cuts in 2010. Within the Department of Natural Resources, the Forestry Bureau portion of the general fund was $2,045,015 or 0.0328% of the state budget for fiscal year 2010.

**Within the Department of Natural Resources, the Forestry Bureau's portion of the general fund is $2,045,015 or 0.0328% of the state budget in 2010.**

**Overview of Iowa's State Budget**

| Agency | 2008 | 2009 Estimate | 2010 Recommended |
|---|---|---|---|
| **Total General Fund** | $5,898,436,938 | $6,041,831,511 | $6,230,500,000 |
| **Education** | 3,443,461,756 | 3,595,337,116 | 3,552,725,869 |
| **Human Services** | 1,279,674,010 | 1,321,081,108 | 1,578,046,645 |
| **Justice System** | 477,816,750 | 484,879,576 | 496,514,517 |
| **Administration and Regulation** | 377,627,745 | 333,139,306 | 294,581,998 |
| **Judicial** | 148,396,285 | 155,843,637 | 163,527,936 |
| **Economic Development** | 96,053,181 | 71,191,761 | 68,574,476 |
| **Legislative Branch** | 33,837,880 | 37,125,646 | 37,814,194 |
| **Agriculture** | 21,324,509 | 21,695,023 | 19,889,964 |
| **Natural Resources** | 20,244,822 | 21,538,338 | 18,824,401 |
| **Forestry (within Natural Resources)** | **2,599,288** | **2,680,010** | **2,045,015** |

Source: www.dom.state.ia.us/state/budget/FY10_Gov_Rec.html, January 2009.

Approximately 1,337,266 Iowans filed a 2007 tax return in 2008. Individual tax returns during this time amounted to $3.1 billion.[1] There are other taxes that the state collects that are earmarked for specific programs, so those taxes were not included for this comparison. Evenly dividing the income tax brought in on a taxpayer average equates to $2,300 for every taxpayer. Applying this same principle to services received shows that each Iowa taxpayer contributes $7.82 of their tax bill to Iowa's natural resources each year; of this, $0.84 goes to the DNR Forestry Bureau. For every $685 collected in income taxes, $0.25 will go towards Iowa's forest resource. These figures show that perhaps the biggest challenge to Iowa's natural resources is lack of funding.

Trees provide many economic and other benefits. Those found in recreational settings enhance camping, hunting, nature study, relaxation, bird watching, mushroom hunting and fishing opportunities for people of all ages. They also provide financial benefits from logging, wood product production, tourism, fruit production, Christmas trees and wreath production and wind, cold and heat protection for buildings and roads. If trees continue to be taken for granted, such benefits could be lost for future generations.

[1]"Comprehensive Annual Financial Report (CAFR) for the Fiscal Year Ended June 30, 2007." Iowa Department of Administrative Services-State Accounting Enterprise. Dec. 14 2007. pp. 138-139.

# Why Trees Are Important in Iowa

Forests provide many benefits to Iowans, most of which we take for granted in our busy daily lives. As you read about the past, current and future conditions of Iowa's forests, think about some of the benefits that you have enjoyed from a tree or a forest. Then contemplate how you are ensuring there will be magnificent trees and beautiful forests to ensure that a legacy for future generations to enjoy is secured, so they get to experience the wonders and awe we see and feel today.

Iowa grown trees and shrubs provide many benefits. The single plant that is a tree seedling soon becomes an ecosystem unto itself, with animals and other plants living in and on it. When many trees are closely spaced on many continuous acres, you have the beginnings of a forest. Many different animals and plants will live throughout the changing forest providing many benefits along the way. When planting trees it is always best to utilize native tree and shrub seedlings from a locally adapted seed source because:

- They are better adapted to Iowa's extremes in weather and to Iowa planting sites.
- They provide superior native wildlife habitat.
- They are less likely to be stressed than non-native plants.
- They are more resistant to insect and disease attacks.
- They are a link to Iowa's natural heritage.
- Non-native plants can invade natural areas and potentially displace native plants and habitat critical to native wildlife.

Generally, people plant trees to grow forest products, to increase or improve wildlife habitat, to protect the site from soil and water erosion and to improve the intrinsic beauty of a landholding, leaving a legacy for future generations. The nice thing about tree planting is that even though a person may be focused on one of these goals, they receive some of the benefits of the other goals as a bonus. That is, when trees are planted for forest products, aspects of wildlife habitat, beauty and environmental protection come right along with the products. Still, a person should pick and choose the species they plant according to their land management objectives and the planting site capabilities.

Spring is a time for trees to bloom with a palette of colors flowering from vibrant flowers that will eventually produce seed. Some of this seed is covered by a hard shell or nut enabling storage of food, while others are soft berries, making it easier for wildlife to feed on immediately. In urban areas hundreds of different types of crab-apple trees brighten neighborhoods as the grass turns green. Out in the country, redbuds are blooming and spring ephemeral forbs are taking advantage of sunlight before the overstory tree leaves expand to capture most of the sunlight. A few

**Dutchmen's breeches blooming on a forest floor in early spring.** Photo by Brandy Sobczak.

of the wildflowers found on a forest floor in the spring include: Dutchmen's breeches, spring beauty, trillium, bluebells, buttercups, violets, yellow bellwort; and others that brighten the forest floor, enticing people to explore more of the forest.

Many people search the woodlands in the spring for mushrooms. Song birds like rose-breasted grosbeaks, various warblers, orioles, finches and sparrows are busy building nests and fill the air with their musical tunes.

**American Goldfinch, Iowa's state bird, in the Spring.**
Photo by Brandy Sobczak.

Wild turkeys begin their annual mating rituals as hunter's set-up to try their luck at bagging a gobbler. Fish begin feeding again as the insects hatch with the brighter sunshine warming the water.

Spring is also a time for planting more trees. Communities replace lost trees from the previous year or add more trees to areas that would benefit from additional shade for various reasons. Conservation tree planting is underway in the countryside as permanent vegetation is established for future benefits that both people and wildlife will enjoy.

Campers begin returning to parks, state forests and recreation areas to visit new places or to return to favorite camp sites, cabins or lodges and get away from the hectic pace of work at home. Trails take visitors through forests to secluded lakes or streams for solitude or fishing, enjoying the calming effects of the natural surroundings.

The strong roots of a tree holds stream banks together after heavy rains fill streams. This reduces erosion compared to stream banks that are bordered by exposed land. Trees along streams provide permanent buffers that intercept sediment and trap nutrient runoff that would otherwise go directly into the stream. Trees also shade the water below, moderating stream temperatures, which reduces stress on fish living in that water.

Summer weather accelerates people's desire to enjoy nature through camping and getting away for a relaxing time in a natural setting. After all, how many people would go camping if there were no trees in the campground? Aren't the first sites to fill up the ones with the best shade? Within the 57,700 acres of state owned parks, 31,700 acres are covered by trees.

Trees have fully leafed-out and are filtering the air for pollutants, storing more carbon and releasing a fresh supply of oxygen for everyone to breathe. Besides the eye pleasing beauty of a forest, there is refreshing air to rejuvenate the body and clear the mind. Trees have an important role to play within our communities as well. Studies have found that communities with more green space have less crime.[2] The shade trees provide lower energy demands for cooling to homeowners and businesses during the warm summer months.

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[2]Kuo, Frances E., Sullivan, William C. "Environment and Crime in the Inner City: Does Vegetation Reduce Crime?" Environment and Behavior 33 (2001): 343-367.

An acre of Iowa forest on a summer day can transpire over 1,600 gallons of water. This cools the surrounding area by as much as 5 to 15 degrees. This effect, when combined with placement of trees around homes for shade, can reduce air conditioning demands from 10 to 43 percent.[3]

Fall gives everyone a second chance to experience the beautiful colors trees can provide. Many small communities benefit from tourism generated by the annual changing of the leaves. A lot of festivals occur this time of year to celebrate the harvest of crops and to prepare for winter.

Some animals migrate before the cold weather becomes permanent. The wildlife that remains seeks shelter from brutal winds and cold temperature by moving into the woodlands. Hunter's set-up for another turkey season and have multiple deer seasons to hunt in.

Tree seeds fall to the ground to provide food for wildlife or to hopefully find a favorable place to grow. This is especially important for those forests that will be harvested that winter. Harvesting provides income for landowners, changes habitat for wildlife and allows sunlight to get to the ground, allowing a new stand of trees to become established. Harvesting timber from forest land is necessary to provide wood products like construction materials, furniture and firewood for people to benefit from.

**White oak seed germinating in the fall.** Photo by Mark Vitosh.

Apple trees and nuts from hickory, walnuts and hazelnuts offer lots of food opportunities that can be used throughout the year for baking or snacking.

Fall is the last chance for campers to take advantage of pleasant temperatures and spectacular surroundings before winter sets in.

The transition time of late fall to early winter offers opportunities to cut firewood when the weather has cooled down and the bugs have died off. The smell of smoke and the sound of a crackling fireplace create a similarly relaxing feeling indoors as a campfire provides during the summer months of the year.

Winter decreases recreational activity in the woodlands to cross-country skiing and snow-shoeing when there is snow on the ground. Snow on the ground tells many stories about what wildlife in the area are eating and where they are going by the tracks they leave behind.

Frozen ground provides opportunity for loggers to remove trees and minimize damage done to the soil. Forestry consultants are actively managing forest areas by thinning stands to create a healthier and more productive forest. Both loggers and foresters are influencing the future stand composition by their activities in the woods. Sawmills turn the logs into products that we can use in our home for flooring, trim, cabinetry and furniture.



[3]Stone, Larry A., ed. Iowa-Portrait of the Land. Iowa Department of Natural Resources, 2000.

Community trees serve as windbreaks, which eases demand for energy to heat homes and businesses. Windbreaks of conifers can reduce heat loss from 5 to 40 percent around farmsteads and rural residences.[4] These windbreaks also provide nesting habitat such as holes for woodpeckers, owls and squirrels, conifers protect chickadees and dark-eyed juncos.

Out in the countryside, windbreaks provide shelter to homes and reduce drifting on roads to allow safe passage for people to travel during snowy weather.

**Trees clean the air by using and storing carbon dioxide and by trapping dust and other airborne particles in their foliage.**

Annual traditions of finding a Christmas tree and decorating it in our homes provides a local business for rural landowners and a fresh smelling tree for consumers during December. In 2007, over 39,000 Christmas trees were cut and sold from the 196 Christmas tree farms in Iowa.

Throughout the year, trees clean water in two ways; by preventing soil erosion, either by holding soil in place or by trapping it as it is borne overland by wind or water and by trapping nitrogen and phosphorous, thus reducing the occurrence of these two elements in drinking water. Trees planted along waterways can be very effective in reducing the amount of soil washed into streams and rivers.

Trees protect the environment by easing summer and winter temperatures, by cleaning water, by reducing soil erosion, by reducing noise and by filtering air. Where water quality is improved, better fishing and other recreational opportunities are possible.

The capacity of trees to reduce noise is often used in cities and towns to diminish highway and other noise.

Trees clean the air by using and storing carbon dioxide and by trapping dust and other airborne particles in their foliage.

I think that I shall never see a poem as lovely as a tree....” So begins a poem by Joyce Kilmer that expresses the ways trees add beauty to their surroundings. Understanding how trees improve the quality of our lives is the first step to appreciating the many benefits that trees provide for all Iowans.

[4]Stone.

# Table of Contents

# Purpose

The 2008 Farm Bill[5] requires each state to complete a Statewide Forest Resource Assessment or "State Assessment" and Statewide Forest Resource Strategy or "Resource Strategy" to receive federal funds under the Cooperative Forestry Assistance Act. State Assessments are intended to identify key forest-related issues and priorities to support development of the long-term Resource Strategy.

The State Assessment and Resource Strategy address forest-related issues of importance to Iowa and are complementary to the following three national priorities:

- Conserve and manage working forest landscapes for multiple values and uses
- Protect forests from threat
- Enhance public benefits from trees and forests.

This document identifies landscape areas where national, regional, and state resource issues and priorities converge. This is meant to be a working document that utilizes the best current data available, works with stakeholders, and adequately considers other state assessments, plans, and priorities. In this way, Iowa's State Forest Resource Assessment and Strategy document is a valuable source for communicating forest-related issues, threats, and opportunities in the state and serves as an important strategic document for the Iowa Department of Natural Resources Forestry Bureau to use for planning and funding purposes.

This document was created using a variety of sources, including:

- An overview of the national requirements and guidance for state assessments with regional clarification and sideboards
- An overview of the national requirements and guidance for the resource strategies,
- Stakeholder involvement
- State Wildlife Action Plan, Forest Legacy Assessment of Need, and Community Wildfire Protection Plans
- geospatial data

To ensure that Federal and State resources are being focused on important landscape areas with the greatest opportunity to address shared management priorities and achieve meaningful outcomes, the Iowa DNR Forestry Bureau has worked with key partners and stakeholders to develop this document. Stakeholder groups coordinated with include Iowa DNR Wildlife Bureau, State Forest Stewardship Coordinating Committee, State Technical Committee, Urban and Community Forestry Council, along with dozens of other conservation groups and individuals interested in the management of the forest resources in Iowa. Topics covered in the document:

- An analysis of past and present forest conditions and trends on all ownerships in the state, including analysis of market and non-market forces;
- Threats to forest lands and resources have been identified in Iowa consistent with the national priorities;



[5]The Food, Conservation, and Energy Act of 2008, commonly referred to as the Farm Bill, was enacted June 19, 2008.

- Explanation of forest related benefits and services;
- Priority forest landscape areas in the state have been delineated across themes and pro grams, ownerships, and the urban to rural continuum, to be addressed by the Resource strategy;
- Identification and delineation of Multi-State areas that are a regional priority.

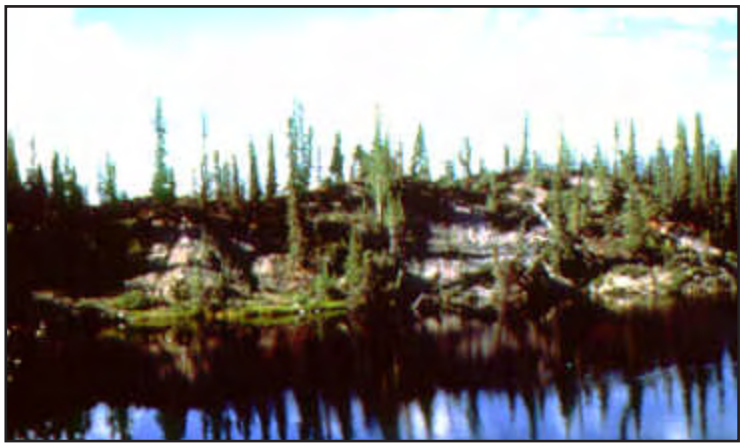
This assessment is divided into nine chapters, with the first seven are modeled after an international system of criteria and indicators known as the Montreal Process. These criteria address biological diversity, the productive capacity of the forest, ecosystem health, soil and water resources, global carbon cycles, socioeconomic benefits from forests and the legal institutional and economic systems that can impede or enable progress in sustainability. The Montreal Process provides a data driven template for reporting information, discussing trends and highlighting forestry issues that are relevant in Iowa. For detailed information on the Montreal Process, visit their website at www.mpci.org/. Not all parts of the Montreal Process had data or were relevant to forestry issues for including in this assessment. In addition, including program specific data that would not otherwise be captured by the framework developed by the Montreal Process has been added where necessary.

Chapter 8 shows priority forest areas, priority community areas, forest legacy areas, and areas that could potentially offer multi-state partnerships to work on common issues related to the forest resource in that area.

Chapter 9 is where the issues, that have been developed by the first seven chapters, are listed with the accompanying strategies required to address them.

# Iowa Background History

The following background history is an excerpt from Iowa-Portrait of the Land:



**This glacial scene resembles the wasting ice sheet present in north-central Iowa 13,500 to 12,000 years ago. The melt water lake and its bordering coniferous trees are perched on the surface of glacial debris still underlain by whitish layers of ice (Klutlan Glacier, Yukon Territory, Canada).** Photo by H. E. Wright Jr.

*The first Iowans came from Siberia, a nomadic people that crossed into North America perhaps 15,000 years ago, no doubt following herds of caribou, musk oxen, and mammoths. They traversed a land bridge exposed when expanses of glacial ice had captured enough seawater to lower the ocean level. By 13,000 years ago, those Paleo-Indian people had found their way to Iowa, where they lived in what must have been harsh conditions alongside the remnants of glaciers. The warming climate eventually halted the glacial advances, however, allowing plants and animals to quickly reoccupy the damp, dark, stony soils that formed on top of and at the edges of the decaying ice.*

*Those early Iowans moved about in cool, moist, spruce and fir forests interspersed with open meadows and wetlands. Hunters pursued mastodons, giant bison, and other big game, often working together to drive the animals over cliffs or into boggy mires where the prey could be attacked more easily. The Indians killed and butchered their quarry with effective stone spears and sharp tools painstakingly crafted from flint. People's lives were short, and populations were sparse, perhaps never reaching more than a few hundred at any one time.*

*As the climate continued to warm about 10,000 to 8,000 years ago, more hardwood forests grew up, with prairies gradually pushing in from the south and west. People followed the resources, camping near rivers to gather wild plants and hunt small game and often traveling to hunt bison. But the innovative native people also began using the atlatl, or spear thrower, to increase their hunting efficiency. They learned to grind and chip stone into tools, such as axes, knives, scrapers, and plant-milling devices. Evidence at numerous archaeological sites suggests that populations were growing, perhaps into the thousands.*

*From about 2,800 to 800 years ago, prehistoric Woodland Indians inhabited an Iowa landscape much like that visited by the first European explorers. Eastern forests met western prairies, with scattered trees on the savanna in between. The trees and shrubs marched out into the grasslands during wet cycles, and then retreated to the valleys during droughts. Native Americans also set fires to kill the woody plants and improve prairie wildlife habitat. The population in what would become Iowa grew to an estimated 10,000 people.*

*The best-known legacy of the Woodland people may be their intriguing mounds of earth. The earliest conical mounds apparently were for burials, but these and later mounds also may have served ceremonial functions. Effigy Mounds National Monument, near Marquette, protects nearly 200 mounds, including several in the form of bear or bird effigies built between 450 B.C. and A.D.*

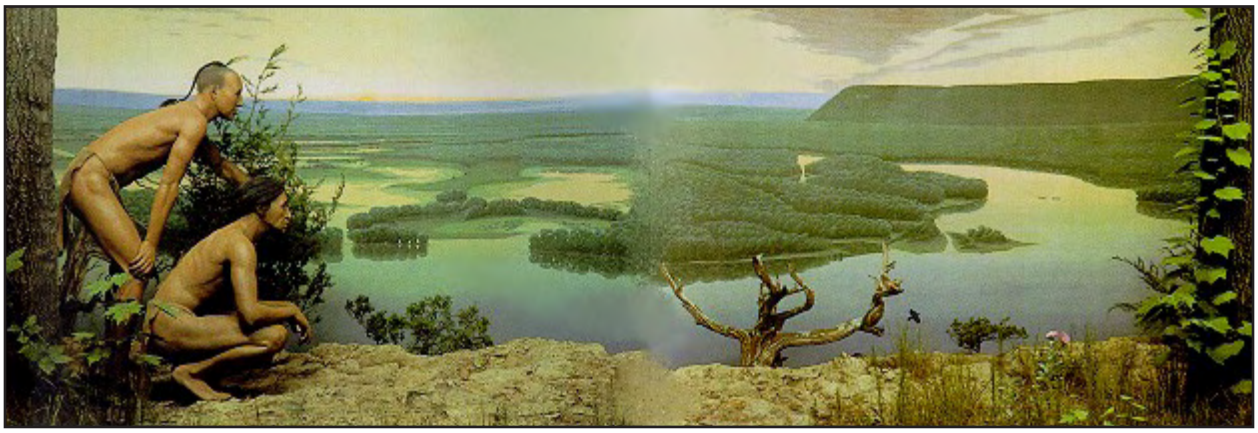
**Indian burial mounds were built on high bluffs or on terraces overlooking river valleys. The mounds also may have marked hunting territories, served as ceremonial centers, or embodied spiritual links with the earth (Fish Farm Mounds State Preserve, Allamakee County).** Photo by Jean C. Prior.

**Great bird mounds take clear shape when outlined with lime as part of a special study done in the 1970s. Iowa's effigy mounds represent creatures from the land, water, and sky. "The mounds and their builders have a message for us today - the human race must integrate itself with the rest of the living world." - R. Clark Mallam, 1986.** Photo by R. Clark Mallam.

*1300.*

*Native American populations in Iowa grew to tens of thousands by about A.D. 1600, but then numbers dropped, apparently due to deaths from warfare and the spread of European diseases. Before the population decline, however, large villages thrived in several parts of Iowa. One encampment ranged across the Big Sioux River valley at BloodRuninnorthwestern Iowa and southeastern South Dakota. Some communities included elaborate earth lodges, palisade fortifications, large storage pits, and log houses.*

*On a misty morning, when the floodplain trees fade in and out of the fog, it's easy to picture the scene more than 300 years ago when Iowa Indians may have watched some of the first Europeans to visit Iowa. Explorer and fur trader Louis Joliet, along with missionary and Jesuit priest Father Jacques Marquette, paddled down the Wisconsin River, and then entered the Mississippi on June 17, 1673. Sent by the Canadian Governor to search for a route to the Pacific Ocean, they had begun at the Straits of Mackinac, and then paddled across Lake Michigan, through Green Bay, and up the Fox River. After portaging overland to the Wisconsin River, they headed downstream to the Mississippi, where they found an imposing promontory we now know as Pike's Peak.*



**This panoramic view shows the historic entry of Marquette and Joliet (in two canoes) into the Upper Mississippi Valley via the Wisconsin River on June 17, 1673. Visitors to Pike's Peak State Park in Clayton County can see the same magnificent view today. This diorama is the centerpiece of Iowa Hall at the University of Iowa Museum of Natural History.** Photo by Kay Irelan.

*Marquette and Joliet barely touched the west bank of the Mississippi; just enough perhaps, to marvel at the abundant wildlife, forested bluffs, hilltop prairies and savannas, and diverse vegetation along the tributaries. Other Europeans would explore across what is now Iowa in the next 150 years.*

*The Louisiana Purchase of 1803 was followed the next year by Lewis and Clark's "Voyage of Discovery" up the Missouri River along what would become Iowa's western border. Although European traders, trappers, and explorers already had been prowling the land for years, the Louisiana Purchase marked the "official" beginning of Iowa's connection to the new nation that was emerging on the North American continent.*

*In stark contrast to the Mississippi River forests in eastern Iowa, trees were scarce along the Missouri River valley. At a site near the present Iowa-Missouri border, Clark described today's Loess Hills as " a range of Ball [bald] Hills parallel to the river and at from three to six miles distant from it, and extends as far up and down as I can see." The short prairie grasses, predominantly little bluestem, made the hills look bare. "This prairie I call Bald pated Prairie," Clark wrote, suggesting emptiness. But the party later went hunting along a stream the Indians called "Neesh-nah-ba-to-na" (today's Nishnabotna River) and found the region far from barren. They killed four deer, and saw "oak, walnut & mulberry" trees.*

*All along the Iowa border, the explorers marveled at the bounty of wildlife in the valley. The hunters sometimes killed as many as five deer a day. The travelers caught their first channel catfish near present-day Council Bluffs, where they found the creatures "very common and easy taken." Around Onawa, Lewis didn't even try to count the number of pelicans, except to exclaim that their numbers "appear almost incredible." Near Sioux City, Clark commented on "very plentiful" beaver, "very fat ducks," and plovers "of different kinds."*

*Geologists are piecing together Iowa's Ice Age history, and archaeologists teach us about the 600 generations of people who were here before Europeans arrived. But the explorers of the 1700s and 1800s not only made history, they began to record it. Iowa was poised on the brink of change. Native Americans, who had harvested the fish and wildlife, farmed, quarried, built, and traded throughout the region, were about to be displaced. The Indian people had lived on and worked the land for 3,000 years. Yet they sketched their legacy lightly on the landscape. Soon their subtle portraits would be painted over by the heavier hands - and greater numbers - of explorers and*

*settlers. The new "artists" looked at the earth differently than the native peoples had, and the newcomers would change that landscape forever.*

*In the 1800's, Iowans reworked the face of their new state with a speed and to an extent perhaps unparalleled in human history. At the beginning of the century, a blanket of prairie cloaked three-quarters of this "land between two rivers." Pothole marshes dotted the flatter north-central part of the state, while a network of streams laced the rolling hills elsewhere across Iowa. Dense forests engulfed some valleys in the east and groves of bur oaks climbed out of the river corridors and onto the ridges to form savannas. Thousands of Native Americans lived on the land, harvesting wild plants and animals, growing crops, and managing the vegetation with fire. By 1900, however, Euro-American settlers had claimed nearly all of Iowa's 36 million acres as farmland.*

*Non-Indian settlement officially began on June 1, 1833, when pioneers first were allowed to claim new land in the 6 million acre Black Hawk Purchase along the west side of the Mississippi River. By 1846, when Iowa became a state, census records listed 96,088 people. The population doubled to 192,914 by 1850 and topped one million before 1870. In 1900, Iowa had 2.2 million people, compared to 3 million people today. Most lived on the state's 200,000 farms, working land where 95 percent of the prairie, two-thirds of the woodlands, and most of the wetlands had been converted to agriculture.*

*The earlier settlers may have preferred to stay close to forest edges, where they could cut trees for building materials, fences, and fuel. But the lack of trees on the expanses of prairie only briefly delayed the rush of settlement to the more open lands of northwest Iowa. Especially after the Civil War, there was a major push onto the prairies. And once the farmers came to an area, it took less than ten years for the "frontier" to become agricultural land.*

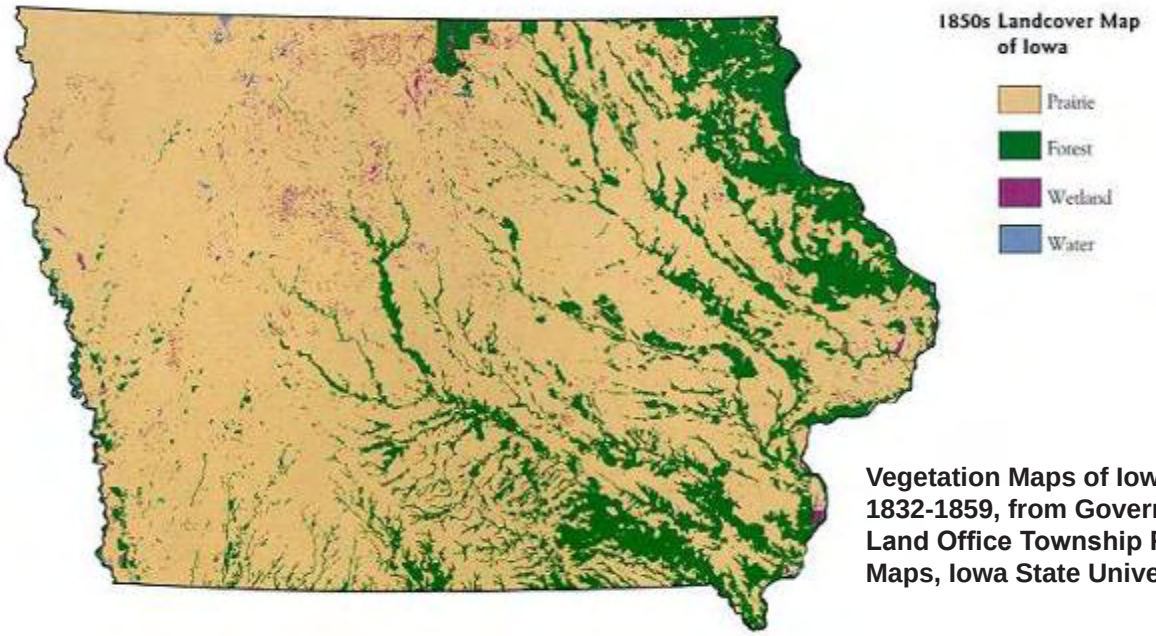
*The dramatic, swift, almost complete change of diverse prairie to a monoculture of cropland profoundly altered the ecosystem. Twenty-eight million acres of bluestem, dropseed, compass plants, coneflowers, gentians, and 200 other species were transformed, in a relative eye blink, into a patchwork of corn, wheat, oats, hay, and pasture. Those plots have expanded to the huge roadside-to-roadside corn and soybean fields that we see today.*

*At the same time, although to a lesser degree, the loss of forests also reshaped the state's landscape. Naturalist Bohumil Shimek described Iowa's pre-settlement forests: "There were still miles upon miles of almost undisturbed timber, fine white oaks predominating on the uplands, the hard maple occasionally dominating the river bluffs, and the red cedar finding an anchorage on the limestone ledges, while the black walnut and various softwood trees occupied the narrow bottom lands. The upland woods were carpeted in early spring with hepaticas and the rue anemone, while the ravines were decked with beautiful ferns, interspersed with pink and yellow ladies'-slippers and many other wild flowers, all in great profusion."*

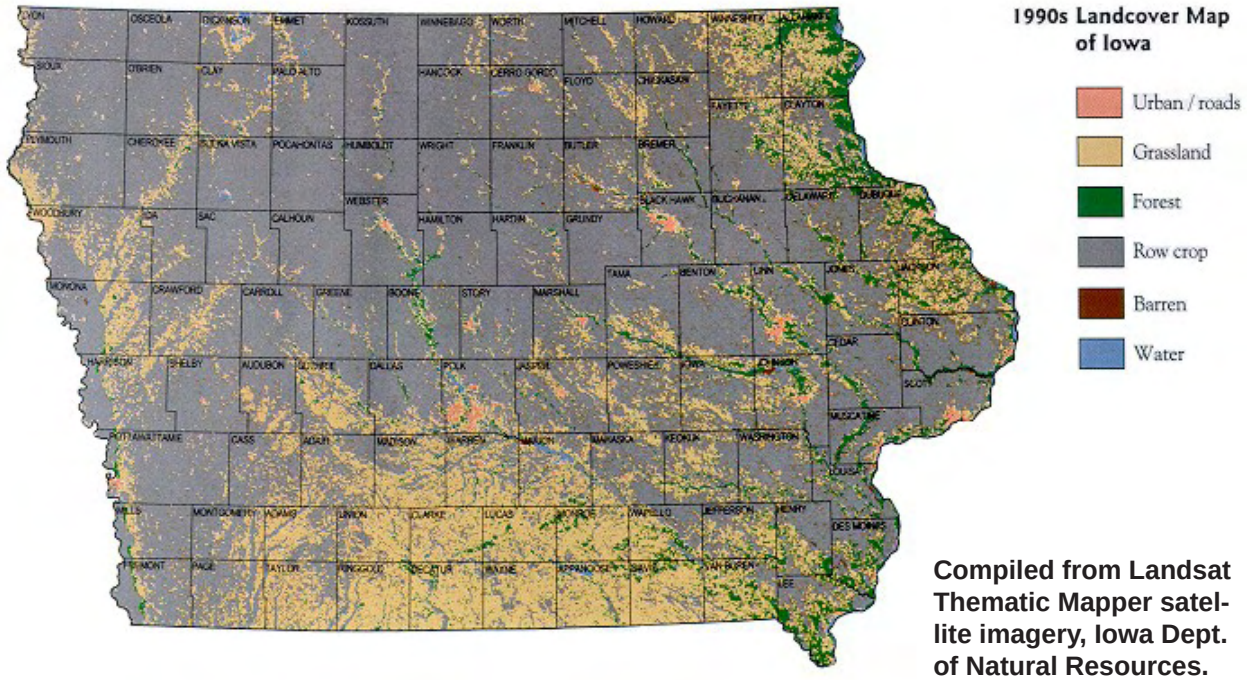
*Early surveyors' notes suggested that trees covered about 6.7 million acres or 19 percent of Iowa around the time of statehood in 1846. As settlers began to grow crops for themselves they began to realize the potential of the nutrient rich black soil. Settlers steadily cleared the forests, however, as they removed trees for agricultural fields, rail fences, log buildings, and lumber. By 1857, the Iowa State Agricultural Society had issued a plea calling for more careful use of timber resources. Steamboat crews, who regularly stopped to cut trees to burn for fuel, decimated some forests along major rivers.*

*The next two maps compare vegetation from the 1850's to the 1990's showing the dramatic, swift, almost complete change of native vegetation to a monoculture of cropland profoundly altering several native ecosystems.*

*After Iowa became a state, the natural resources were critical for making a living. When railroads came to Iowa in 1855, they brought another assault on the woodlands. The state's eventual 10,000 miles of rail lines needed about six acres of oak woods, perhaps 800 trees, to make ties for every mile of track. Railroad ties usually had to be replaced every five to seven years. Railroad cars, trestles, and fuel for some steam engines also required wood from the forests.*




**Vegetation Maps of Iowa 1832-1859, from Government Land Office Township Plat Maps, Iowa State University.**



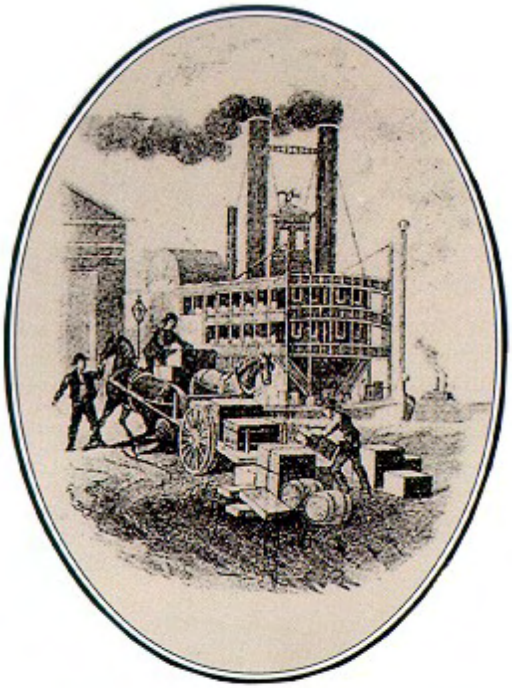

**Compiled from Landsat Thematic Mapper satellite imagery, Iowa Dept. of Natural Resources.**

**Source: Landsat Thematic Mapper Satellite Imagery (TMSI), Iowa DNR**

*Often, trees grew back rapidly after they were cut. But with the invention of barbed wire in 1873, the forests faced another threat, as farmers found it easier to use woodlands for grazing. Although livestock didn't always destroy the forests, these animals compacted the soil, ate or trampled seedlings and forbs, which changed the character of the woodland community. Coal mining also took its toll on forests as trees were cut to shore up mine shafts. By 1900, more than 4 million acres of Iowa's original 6.7 million acres of forests had been lost to other uses.*

*As much as they cut trees, however, nineteenth-century Iowans liked to plant them. Many farmers started windbreaks and shelterbelts around their farmsteads for shade and protection from the prairie winds. As people controlled wildfires, and with roads and fields as firebreaks, tree growth expanded into what once had been grasslands. When cities grew, urban residents also planted trees along streets, around houses, and in parks.*

*In the process, people transformed the sponge-like character of the land, where water once had soaked into the ground. The farmers' artificial drainage ditches began to expand, forming water courses that grew and eroded with more runoff. New tile lines diverted more water to the channels.*



**Riverboats carried settlers into the country's interior. The steamboats burned enormous amounts of wood, cut from the timber along Iowa's river valleys. The above image was printed from an engraving on lithographic limestone quarried in Floyd County and published in Clement Webster's 1915 issue of Contributions to Science to illustrate the high quality of this Iowa stone for printing.**

Photo by of Clay Smith.

*Steam dredges cut drainage canals to further speed the water away. The picture below shows a straightened channel of the Little Sioux River in Monona County. This "river" now quickly drains highly productive agricultural fields after rain events.*

*Instead of seeping gradually into the land, the water is hurried away downstream through a new network of surface connections.*

*Elsewhere in Iowa, landowners often shortened or altered rivers. On the more*

*rolling land, thousands of miles of rivers and streams had developed over thousands of years, as water found its way gradually downstream to the sea. If those sometimes-meandering rivers ran where people wanted to put farm fields or highways or other structures, engineers frequently used machines to straighten, or channelize, the waterways. The process started in the late 1800s but reached its peak in the early 1900s, after heavy equipment became more common. By some estimates, Iowa lost more than 3,000 miles of streams to channelization before government restrictions curtailed the practice. Channelization also sped the flow of floodwaters onto the land of downstream neighbors, lowered the water table, and encouraged the drainage of some lakes, sloughs, and river backwaters.*

*Draining the wetlands, plowing the prairie, clearing the forests, and mining the land also destroyed or significantly altered the habitat for wildlife that once lived there. Iowa's wildlife populations declined dramatically through the nineteenth century. The first white explorers marveled at the bison, elk, wild turkeys, deer, prairie chickens, bears, wolves, waterfowl, shorebirds, and other birds and animals that thrived in the fertile prairies and scattered woodlands. "I had never rode through a country so full of game," declared Joseph Street, an Indian agent who traversed the Turkey, Wapsipinicon, and Cedar rivers in northeast Iowa with a survey party in 1833.*

*The first non-Indian settlers killed game almost at will. They easily took deer, turkeys, and prairie chickens for food. In wetlands, people gathered duck, goose, and swan eggs in the spring and shot the birds virtually year-round for food and feathers. Market hunters also slaughtered shorebirds and waterfowl by the hundreds, often shipping the birds to restaurants in eastern cities.*

*River otters and beavers initially thrived in most rivers, streams, and marshes and trappers sought them for fur during the heyday of the fur trade in the late 1700s. During the nineteenth century, trapping pressure, habitat loss, water pollution, wetland drainage, and stream channelization gradually took their toll. Beavers and otters were essentially gone from Iowa around 1900.*

*The combination of hunting, a growing human population, and the conversion of prairies and forests and wetlands to farm fields spelled doom for many species. By 1867, the last Iowa mountain lion had been killed. Bison vanished from the state in 1870, elk in 1871, black bears in 1876, wolves about 1885, and whooping cranes by 1894. Passenger pigeons were mostly gone from Iow*a *by the 1890s, and they would become extinct by 1914.*

*It was a time of transition. In the nineteenth century, we changed our state from a place controlled by natural forces to a landscape dominated by human handiwork. A pioneer child might have ridden in a covered wagon on a trackless prairie, watching elk and prairie chickens. That same person could have greeted the twentieth century with a ride behind a steam locomotive, on tracks linking urban industrial centers, passing neat farmsteads built on a mile-square grid of roads.*

*Incredibly, this astounding transformation from a natural landscape of wild places teeming with wild creatures to a checkerboard of manicured crop fields, cities, and roads, took place in barely 60 to 70 years, less than a lifetime.*

*A conservation plan published in 1933, 100 years after Iowa was opened to settlement, bluntly listed the losses of the past century: "the waste of Iowa's greatest asset, the soil; the unwise destruction of surface waters by drainage, pollution and silting; the heedless stripping of woodlands; the almost wanton destruction of wildlife; the irrational use of funds for recreation in several forms; the patent failure to capitalize the state's fine potentialities all along the line."*

*Rather than dwell on negatives, the plan spelled out details for work that would not only "call a halt" to the abuse, but also might rebuild the resource base for future generations. Decades later, we still must commend the extraordinary foresight of proposals to fight soil erosion, improve fish and wildlife habitat, build parks, preserve forests and prairies, and beautify roadsides.*

*All told, the planners estimated the costs of the proposals, including land acquisition and improvements, at only $2 to $3 per person, or $9 to $12 per family. The cost could be paid by hunting and fishing license fees, park concessions, gasoline or automobile taxes, cigarette taxes, or special levies, the document said. Significantly, the plan also suggested legislation and governmental reorganization to benefit conservation.*

## *1933 Conservation Plan Highlights*

- *Provide state aid to landowners to fight erosion.*
- *Clean up and provide access to state lakes and rivers.*
- *Help landowners with forest management. Set aside state forests.*
- *Restore wildlife with habitat improvement, research, and refuges. Help landowners and provide habitat along roadsides and other public lands.*
- *Make Iowa's fishing "better than it ever has been." Stop pollution, build artificial lakes, protect natural lakes and streams, and restock many waters.*
- *Establish a state park within forty miles of every Iowan, and set aside a network of at least seventy-five state preserves to protect unique natural areas.*
- *Integrate scenic highways and roadside parks into the conservation plan.*
- *Preserve remnants of Iowa's prairie, nearly gone in 1933.*
- *Combine Board of Conservation with Fish and Game Commission.*
- *Protect fishing and hunting license fees from diversion to other uses.*
- *Add easements for public access and to protect scenic areas.*
- *Restrict commercial use near state lakes, parks, and preserves.*
- *Give counties planning and zoning authority.*
- *Regulate timber cutting with zoning.*
- *Give counties authority to organize park districts.*
- *License billboards.*
- *Authorize Highway Commission to build roads in state parks.*

*Many of the plan's components came to pass, some sooner and some later. Iowa's county conservation board system, which was a model for many states, began with legislation passed in 1955, some 22 years after the idea was formally proposed.*

*Some other ideas in the plan have changed considerably or become blurred through the years. For example, the plan's definition of a park, preserve, wildlife refuge, and sanctuary is not always clear today. "The 1933 plan emphasized the need for roadside management, but has taken decades for us to recognize the potential of highway corridors as refuges for wildlife and native plants. Statewide zoning of everything from billboards to timber cutting did not catch on. County zoning in many cases drew a similar negative response. And the concept of protecting the land or natural features by easements has not gained popularity, as the 1933 planners had hoped it might.*

*Still, the plan became a catalyst for conservation. Several groups, both public and private, that today lead Iowa's conservation movement can trace their roots to the dedication of those early leaders. The ambitious recommendations, presented nearly seven decades ago, set goals that*

*shaped Iowa's conservation accomplishments for the rest of the 20th century. And the authors laid down a challenge that may apply equally to the 21st century: "Let every citizen of Iowa catch and hold that vision of the economy and the enrichment of human living to be achieved only through state-wide, far-sighted development plans. Not for too visionary, but for too meager-minded planning shall we be held to account."*

*Today we work this land, or perhaps it should be said that the land works for us. It grows our food, supports our buildings, provides raw materials for our industries, absorbs our wastes, and stores our water supplies. Therefore, we need to understand what this ground beneath us is like - what holds it up, what gives it shape and texture, what finite resources lie within its depths, how vulnerable it is to contamination sources, and whether it can heal itself if we damage it. Armed with this basic geological information, we can begin to comprehend how much the land and its characteristics affect our daily lives. We can also let the land guide the sensible use of its many resources and our quest for solutions to environmental problems.*

*Prehistoric people lived and farmed along the streams and on the hilltops. Newly arrived settlers and their descendants tucked cities beside the rivers and built farmsteads on the uplands. Farm ponds and reservoirs, like Red Rock and Rathbun, now supplement the region's scarce groundwater supplies. Despite the rolling terrain, careful farmers learned to protect the land. They trim their crop fields with terraces and waterways, grow hay on the steeper slopes, raise cattle on the grasslands, and protect the oak-hickory forests. Without such vigilance, landowners might lose their topsoil to erosion and their woodlands to trampling by livestock.*

*Pioneers brought cattle to graze on the native grasses and worked tirelessly to drain and plow the river bottoms. Later, in an effort to tame the floods along the Missouri and its tributaries, engineers straightened some streams and built levees to confine their flows.*

*As human engineering sped the water along, the riverbeds cut deeper and banks eroded. Wetlands dried up as their water seeped away through the sandy underground connections between the river and surrounding land. Still, the aquifers hold ample water to supply wells for industry, irrigation and drinking water.*

*Iowa is one of the most intensively used and frequently disturbed landscapes in the world. Even farmers, who turn over only the upper few inches of most of our landscape every year, have assumed earth-moving powers. Thus, while we live on an earth fashioned by nature and time, we've often used our machines, and our whims, to alter the environment around us.*

**Meander loops and oxbow lakes along the Iowa River in Tama County indicate porous floodplain materials and a shallow water table. Knowing the composition of Iowa's earth materials is essential to understanding the capacity of the land to transmit contaminants and to protect water supplies.** Photo by Gary Hightshoe, Iowa State University.

**Ancient Iowans were drawn to places where the land speaks in scenic eloquence (Turkey River).** Photo by Gary Hightshoe.

**Iowa's land is a rich mosaic of cropland, pasture, timber, and a long rural heritage (Saints Peter and Paul Church in northeast Johnson County).** Photo by Drake Hokanson.

*The landscape is where all human activity takes place, and learning to live with it is essential. If we understand its building blocks, however - the bedrock, the soil, the water, the air, and their inherent relationships - then we can protect the land and its heritage, our heritage.*

**An Amish farmer and his draft horses work the land together near Sharon Center in southern Johnson County.** Photo by John M. Zielinski.

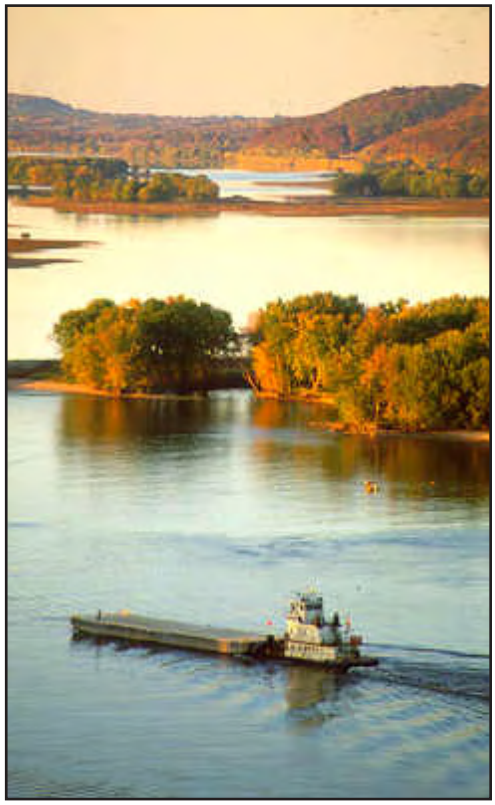
# Iowa Today

*In autumn, thousands of people make the pilgrimage to northeast Iowa to savor the spectacle of the changing leaf colors. At Effigy Mounds National Monument, some tourists watch barges and bass anglers on the Mississippi River, while they listen to the calliope music from an excursion boat. But other visitors may feel the centuries-old spirit of Indian families sculpting a bear effigy from the soil of a bluff top, honoring the earth that sustains all life.*

**Gentle slopes, extraordinarily productive soils, and timely rains enable a bountiful soybean harvest.** Photo by Photographic Services, University of Iowa.

*But most Iowans cling to another legacy as well. Instinctively, we're drawn to the shade of a bur oak, a gnarled veteran that survived long-ago prairie fires only to be caught up in the ceaseless battle between woodland and prairie. We pile bird seed on our windowsills, reaching out to the creatures whose homes and habitat we may have disrupted in our attempt to harness the land. Picnickers and swimmers and boaters and anglers crowd close to our precious lakes and rivers. We prize our woodland trees - some for their beauty, some for their lumber, and some for the solitude we find beneath their canopies. With childlike wonder, we delight in the*

**Above: Tiling wetlands transformed the prairie pothole region to highly productive agricultural land.** Photo by Lowell Washburn.



**Right: The rivers that thread Iowa's land are important avenues of commerce as well as valuable wildlife habitat (Mississippi River, Jackson County).** Photo by Clay Smith.

**The question is not what you look at, but what you see. - Henry David Thoreau, Walden, 1854**

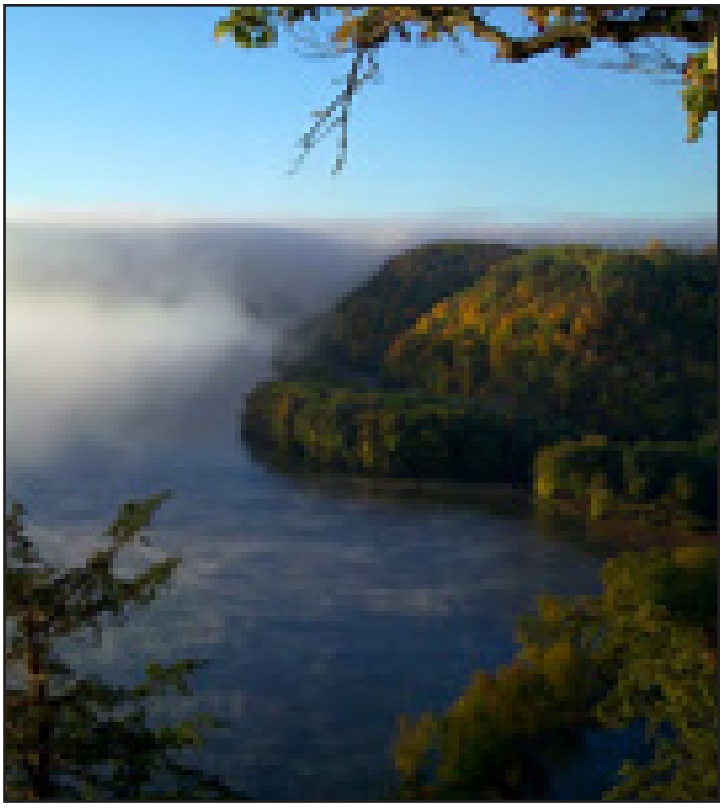
*grace of a monarch butterfly, the intricacy of a spider web, the promise of a northbound flock of geese, the aroma of a wild rose, and the antics of a fox squirrel.*

*We name our rivers, streets, subdivisions, shopping malls, truck stops, sports teams, and even pesticides for the plants and animals that make up our natural and cultural heritage. Some of us fish or hunt or trap because we feel a tie to ancestors who lived off the land. To some, it feels good to till a garden or grow flowers or plant trees.*

*More than 100 centuries, 10,000-plus years of time and cultural transition, separate us from the mastodon hunters. To be sure, the land has changed, and we, in turn, have left our indelible stamp upon the land. No, we cannot relive the times or recreate the places those prehistoric humans knew. Yet, in the ways of the Earth, their footprints have barely faded. In geologic time, we're only a heartbeat removed from people whose Iowa roots we share. We live on the same land, gaze over the same valleys, and bond to the same rich earth.*

*Each citizen is a thread in the fabric of the canvas on which our land's portrait is painted. But only we, as human beings, can choose the tints, textures and brush-strokes to bring that portrait to life. For our children's sake, we must not make those choices lightly.*

*With the benefit of 150 years of hindsight, we could bemoan the sometimes-flawed*



**Oak-hickory woods are Iowa's most common forest type.** Photo by Jessica Flatt.

*mural Iowans have painted on the land as we developed our state and used our resources. The push to build productive farms, cities, and industries probably overshadowed a concern for natural areas. People may have taken the forests, marshes, and prairies for granted and assumed rivers always would run clean. Who could imagine that abundant wildlife might disappear? The industrious people were too busy to notice the abuse of their natural resources or the scope of their loss.*

**With more than 92 percent of our woodlands in private hands, individual decisions will shape our future forests.**

*But there's hope. Developing a new ethic, a fresh outlook, with pride in our land stewardship, Iowans could live in a sustainable society. We're joining citizen groups that work effectively for conservation. We believe we can improve the quality of life in Iowa.*

*To meet that goal, we must assess the health of our land and realize that the diagnosis reflects our own attitudes and actions. We can be proud of our progress, but we must admit where we've fallen short. As we look ahead, we're thinking of our children and grandchildren and the community they'll have to build upon. Perhaps we need to repair parts of that foundation, to repaint some tarnished images, and to consider the well-being of all the citizens of that land community.*

*While heavily damaged, Iowa's forests escaped the almost complete devastation we imposed on our other natural systems. They were spared partly because they grow on land unsuited for other crops and partly because people prize trees for wildlife, shade, windbreaks, aesthetics, recreation, and wood products.*

*Early settlers saw trees as commodities to be used or as impediments to agriculture. Of the 6.7 million acres of forests in Iowa in 1850, nearly two-thirds, more than 4 million acres, had been lost to clearing, grazing, logging, or fuelwood cutting by 1900. The destruction continued with intensive crop and livestock farming. By 1974, only 1.5 million acres of woodlands remained in Iowa. Since then, our forests have rebounded to about 3 million acres, due to less grazing and more trees being planted. Some cities have even developed forest-like canopies.*

*These forests aren't just in public parks. With more than 92 percent of our woodlands in private hands, individual decisions will shape our future forests. People who own woods for hunting or other hobbies may manage the forest very differently than did the farmers who used the timber for grazing or firewood cutting. Iowa is a farm state, but farm fields don't preclude forests. People like trees, and they are welcoming their return to diverse green space.*

*(End of excerpt)*