

Managing ota's itural Resources: the DNR's First Jourgars 1931-1981

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Craig Borck

The View 50 Years Ago

C hester Wilson, the lawyer who drafted the legislation creating the Department of Conservation in 1931, remembers when Gov. Harold Stassen asked him to take over the agency Wilson had helped create. "Chet," Stassen said, "I want to appoint you Commissioner of Conservation."

"I'll have to think that over," Wilson said. "I've got a good job now. Commissioner of Conservation is the hottest job in state government."

Wilson finally accepted, but his observation was as true in 1943, when he began his record 12-year term, as it is today. The Department of Conservation — now called the Department of Natural Resources — has lived with controversy since it was established over a half century ago.

"This conservation movement traveled a very difficult road," wrote an editorialist in a 1933 issue of *The Minnesota Conservationist*, the department magazine. "Selfish interests, powerful and resourceful, placed obstacles in the way. Sportsmen's groups, women's organizations, conservationists, and others who believed that the bounties of nature were intended for the common use and happiness of all mankind, found themselves beset with enemies at every hand. But sentiment for conservation became crystallized and assumed such proportions that lawmakers could not avert their eyes." The long struggle to create a single agency responsible for Minnesota's dwindling natural resources was won in 1931 when four units of state government — forestry, game and fish, drainage and waters, and lands and timber — were combined into the Department of Conservation. The new agency, headed by a five-member commission and an administrator, traced its roots to commissions and departments set up in the late 1800s to manage state resources. The work of those early agencies was, at best, uneven and, at worst, ineffective and fraudulent. "Previous to 1931," stated an early department report, "conservation progress in Minnesota was both painfully slow and haphazard."

Minnesota's developing conservation ethic, which the new department brandished as a weapon and wore as armor, crossed the lance of tradition. For nearly 100 years, pioneers sought to extend their domain over Minnesota's wilderness and market hunters reaped private profit at public expense. The great pine forest, a green canopy that stretched across eastern and northern Minnesota, had been clearcut or carelessly burned. The passenger pigeon was extinct. Buffalo, cougar, and grizzly bear had been driven from Minnesota. Elk and caribou were rare. Moose and beaver were growing scarce. Millions of acres of wetlands had been drained.

"Commercial exploitation in the past has despoiled our forests, marred our landscapes, and dissipated our resources," Gov. Floyd B. Olson proclaimed in 1933. "It has robbed our people of the greater part of their heritage of natural resources. Let us guard what is left diligently and zealously."

Diligence and zealousness alone, however, would not carry the day. Research and education were also important, for the Department of Conservation faced difficult technical and political problems. Many



remain as problems today. How many of these 50year-old issues do you recognize?

• "Our ducks and geese are surely headed straight for extinction unless we. . .do something about it and do it quickly," wrote one author in a 1933 issue of the *Conservationist*.

The department must buy and preserve land along Lake Superior "or accept the inevitable, the ultimate industrialization of the North Shore,"
E. Victor Willard, acting Commissioner of Conservation, wrote the same year.

• "Animosity has replaced friendship and a spirit of cooperation between farmer and hunter," another article warned. "What is needed is a new code of ethics on the part of the hunter."

• "Minnesota was notoriously laggard in matters of conservation," declared a 1933 deparment report. "Our officials talked glibly about the size of our trust funds, using this as a cloak to cover up the exploitation by powerful commercial interests." (In fact, more than four million acres of state trust-fund lands had been sold since Minnesota had become a state.)

• The need for new recreation lands became pressing as people began to view the wilderness and outdoor activities as increasingly important tonics for city dwellers who saw little but concrete sidewalks and stone office buildings during the work week. One contributor to *The Minnesota Conservationist* attributed to outdoor recreation the educational, physical, social, and spiritual betterment of the young. Another said tourism was rapidly becoming a major state industry and made his point this way: Logging generated \$75 million in 1900, its peak year; tourism brought in \$90 million in 1936, the midst of the Depression.

• During the early 1930s, the department,

concerned about dwindling supplies of rich natural iron ore, began testing lean ore for making iron.

The Depression launched the Department of Conservation, but with a boost from the federal government. Unemployment programs provided laborers and skilled workers who planted trees, planned parks, constructed buildings, and cleared trails. The loss of private lands through tax forfeiture enabled the state to consolidate its holdings for wildlife management areas, state forests, parks, and other land units.

Two big changes in the department — one substantive, the other symbolic — should be noted. In 1937, the Conservation Commission was abolished and a single Commissioner of Conservation, appointed by the governor, was put in charge. Then, in 1971, the agency's name was changed to the Department of Natural Resources to reflect its broadening responsibilities.

Through the years, natural resource management has become increasingly complex. Old problems persist; new issues arise. More people are putting wild areas to more uses. Attitudes change and render old policies obsolete. The task of managing Minnesota's resources has required research, persistence, flexibility, insight, and the help of those who find occupation or respite in the outdoors.

"We have deserted the anti-social doctrine of the past as it pertains to our natural resources," declared the *Conservationist* in the early 1930s. "We are...planning with an eye to permanency so that future generations will inherit an empire of wealth rather than a land shorn of the blessings which nature bestowed upon it."

That goal, elusive and controversial, is as desirable today as it was a half-century ago.

Dawn in a state part, Campers slumber. An overturned canoe awaits another day of fishing. Tranquil scenes like this are possible because dedicated conservationists fought to preserve the state's unique natural areas.

1. A.



Creating Our State Parks

n the story of the department, few events have been as spectacular as the growth of Minnesota state parks and recreation areas.

Consider this: In 1938, when the newly formed Division of Parks and Recreation published its first comprehensive park plan, the author proudly noted that 650,000 people visited state parks each year. (More correctly, there were that many visits, since many people made more than one visit to a park and thus were counted more than once.) That was only the beginning.

Twenty years later, in 1957, there were more than 2.4 million park visits. Today, nearly seven million visitors enter our state parks each year.

The variety of activities visitors pursue in state parks is no less dramatic. In the early days, people wanted to camp, fish, and picnic. Perhaps a few wanted to hike or to ride in a boat or canoe.

But today visitors are hiking, biking, and jogging. They paddle canoes, kayaks, and rafts down turbulent rapids. They fly from bluffs in hang gliders. They tote bags of equipment to take pictures. In winter, they cross-country ski or ride snowmobiles. Still, many want to camp, fish, and picnic. Increasing competition for space in the state parks has caused problems among visitors. One thorn that recently has pricked park managers — and many visitors — is the compact, loud, portable stereo.

Recently, a man asked another camper to turn down an obstreperous set that disturbed people in the entire campground. "Get lost!" the stereo owner replied. Frustrated and angry, the man returned with a rifle. With five shots, he stopped the high-fidelity tape player dead in its tracks.

"Competition for existing public lands is keen and building," says Don Davison, Director of Parks. "What's in the future? You think of the ingenious ways Americans come up with for recreation — what's next? Jet packs on your back? You won't need trails, just landing pads."

The first unit in the state park system was Camp Release State Memorial Wayside, a 17-acre site along the Minnesota River established in 1889 and eventually turned over to the Minnesota Historical Society. The first state park, Itasca, was established in 1891. Comprising more than 30,000 acres, Itasca is the state's second largest park and one of the most popular.

For years, management of state parks bounced from government office to government office. Until 1925, parks were the responsibility of the state auditor. Between 1925-31, they were run by the auditor in league with the commissioners of forestry and game and fish. The Division of Forestry ran them for four years

138Casting to a fam.

beginning in 1931. In 1932, the Division of State Parks was created "for the purpose of public recreation, or for the preservation of natural beauty or natural features possessing historic value."

Park planning and administration benefitted from the Depression. Federal planners were "loaned" to states. The parks' first naturalists were Works Progress Administration workers. "This in a sense was really the beginning of park professionalism," says U. W. "Judge" Hella, division director from 1951 to 1973.

Goals set by this growing group of professionals included the practice of building roads helter-skelter through parks, designing buildings compatible with — in fact, hidden in — natural areas, equipping camps with sewage systems to prevent pollution, and employing naturalists to reveal a park's natural wonders.

The Depression also brought skilled craftsmen into the parks. Their legacy includes attractive log and stone buildings and bridges and stairways that remain in use today. Their work nearly doubled the value of state park land and facilities during the early 1930s — from less than \$2.5 million to more than \$4.6 million.

Hella, who played a large role in the first state park plan in 1938, was the first architect of the state park program. One of his most ambitious pursuits was to expand park boundaries and to buy land within those borders before the price of land soared beyond reach. Another goal of that original plan was to establish a park or recreation area



Built in 1853, restored in recent years, the Meighen store invites visitors today at Forestville State Park.

within 30 miles of every state resident.

Under such a philosophy, the system has grown. In 1938, there were 20 state parks and dozens of memorials, recreation preserves, waysides, and monuments, whose area totaled 45,000 acres. Today there are 65 state parks and 11 waysides that include 180,000 acres.

The process was hastened in 1963, when the Legislature passed one of the most pivotal pieces of law and imposed a two-cent tax on each pack of cigarettes. The proceeds were dispersed by the Legislative Commission on Minnesota Resources to accelerate work on parks and other projects, including trails and wild and scenic rivers.

Another important law was the Outdoor Recreation Act of 1975, which required the Division of Parks to write a plan for a park before proceeding with development. The law's objectives were to use public money most efficiently to benefit park visitors and to protect the natural values of the parks.

In a speech he once wrote for former Commissioner Jarle Leirfallom, Hella quipped, "All state parks are born in bitterness." Similar axioms have been declared since the first state park was established. With increasing competition for land, those generalizations are becoming more accurate. Even so, the department and citizen groups have pressed for new parks to benefit all people in the state.

"In a democracy you always have opposition to anything you do," says Hella. "But it doesn't mean the majority isn't with you."



State parks provide facilities for both summer and winter visitors.



Regrowing Our Cutover Forests

granite obelisk rises from a small cemetery near Hinkley. Beneath the neatly trimmed grass near its base lie the remains of more than 200 residents of Hinkley who died in the fierce fire of September 1, 1894, and were buried in three long trenches. In all, 418 died in that conflagration. Figuratively, the blaze inaugurated Minnesota forestry.

Alarmed by the great loss of life and property, the State Legislature created the post of chief fire warden, and Civil War veteran General Christopher C. Andrews was appointed to fill it. Andrews, working for a paltry \$1,200 a year and with a meager annual budget of \$11,000, launched the fire prevention and reforestation policies that established his national reputation as the philosopher and architect of state forestry.

Thus, when the department was formed in 1931 and the State Forest Service became the Division of Forestry, foresters' goals were well established: to arrest disastrous forest fires and to replant lands denuded during turn-of-the-century logging clearcuts. Both jobs seemed overwhelming.

"We used to hire people to fight fires and told them to bring a shovel," says Clarence Prout, a one-time conservation commissioner who began as a forest patrolman in 1925. "We didn't even have a truck." The task of managing forests for a sustained yield of timber seemed even more improbable, as R. N. Cunningham pointed out in a 1933 issue of the *Conservationist*: "The forest problem in Minnesota is not so much one of saving the remaining timber supply — there is too little of it left to save — as it is to rebuild the forest which has been swept away by logging and fires."

"The forests of Minnesota were slashed and burned with a veritable religious enthusiasm, the fallacy that the plow follows the ax motivating an atrocious land policy," wrote Julius F. Wolff in his doctoral thesis on Minnesota resource management. To preach reforestation in such an environment was radical: "We were kind of like missionaries going into the wilderness," says Prout.

And preach they did. Fortunately, as years passed, their cause was aided by technology. "The mechanization of the Division of Forestry has been tremendous," says Prout. The biggest advance in fighting fires was "getting away from that back-breaking toil with shovels and back pumps and going to airplanes and helicopters."

Advances in equipment and methods have allowed firefighters to detect fires early and get to them quickly before they have a chance to grow and spread. Some fires, though, fanned by dry, hot winds into the treetops, overwhelm even the most modern equipment.

During the early years of the department, several new lookout towers were built, and a large equipment supply depot was set up in Grand Marais. Since then, the central supply depot has moved to Grand Rapids.

During the Depression, emergency conservation workers cleared fire breaks, strung telephone lines, and built roads and trails, all of which aided the fight against fires.

Radio-equipped planes were first used for spotting fires in the early 1950s. New radio repeater stations allowed radio communications around the state, even into remote areas where long-distance communication was hitherto impossible.

Despite these advances, forest fires still burn with disastrous results. In 1976, the state's worst drought in 40 years created conditions for the 2,400 fires that burned more than 100,000 acres in the state.

Nonetheless, several new weapons were used against fires. Helicopters with drop buckets holding up to 900 gallons of water slowed the advance of fires. Reloading as often as once a minute, each chopper performed the work of 75 fire fighters. World War II bombers, guided to their targets by small spotting planes, each dropped up to 2,000 gallons of fire retardant per flight. Out-of-state fire fighters were used for the first time on Minnesota fires. There was extensive cooperation between DNR fire fighters and rural fire departments and the National Guard. And for the first time, the Commissioner of Natural Resources imposed a statewide burning ban.

The improvement in equipment continues. The DNR now is finishing a statewide communication system with several channels that will allow better communication between state fire fighters and rural fire departments.

While the battle against fires was waged with sophisticated equipment, the improvement of forests was marked by the acquisition of forest land, the growing professionalism of staff members, the use of new technology and methods, and research that allowed better use of forest products.

In 1931, the fledgling department took charge of five state forests comprising fewer than 500,000 acres. The Legislature created 13 new forests in 1933, but, as the secretary of the Conservation Commission noted, they were "paper forests," since lawmakers appropriated no money for acquisition. Since then, the number of state forests has increased to 55. They include more than three million acres.

The department and Legislature have improved the state nursery and tree-planting program. During the 1930s and early 1940s, the department planted an average of three million seedlings on state land. In 1947, the Legislature approved a plan to sell stock to private landowners, and the benefits of nurseries began to spill over onto private land. In 1957, the department began working with the Agricultural Stabilization and Conservation Service to give landowners advice in managing private forests. The replanting effort has intensified: In 1981, the DNR will produce 23 million seedlings for planting on public and private land.

The airplane also aided reforestation. In 1958, World War II biplanes began their first flights against the spruce budworm by spraying thousands of acres of balsam fir on the Kabetogama Peninsula. Fifteen years later, airplanes were used to seed cut-over black spruce sites near Littlefork. Now, more than 4,000 acres are seeded from the air each year. Airplanes also have been used increasingly for aerial photos that are needed for inventories and forest management plans.

"The management of timber is much more professional than it was when I was there," says Prout. "When I went into the department, only about five of us had degrees. Others were loggers or former trappers."

Forestry has become an increasingly technical and specialized field as research has led to greater understanding of species, habitat, and soils. Furthermore, the Depression ironically made available more workers to plant trees, build logging roads, and make other improvements on forest lands. "One of the things that really helped us was the Civilian Conservation Corps camps and the Work Progress Administration," says Prout.

One major trend in logging has put a bind on loggers and on the DNR. Since the 1950s, logging - like agriculture - has favored large companies at the expense of small firms; big, expensive equipment over simpler tools more easily affordable by independent loggers. That trend has put some independent loggers out of work, has increased the importance of environmental safeguards, and has burdened many of the 1,400 miles of logging roads in state forests. "They were built 30 years ago, and they didn't anticipate 80,000-pound trucks," says Bob Hance, Supervisor of Operations and Planning for the Forestry Division. Moreover, the use of larger equipment "has placed pressure on the Division of Forestry to speed up the way we handle timber sales," Hance says. Changes in timber sales, approved by the 1981 Legislature, have streamlined the process and also have created "small auction sales to give the small independent logger a better chance at purchasing the wood," Hance says.

Another major development presages more extensive use of the forests. Aspen, once known as a "weed tree," has been used to make more and more wood and paper products — waferboard, high-quality paper, and furniture. The shredded



bark is also being used experimentally as a supplement to animal feed. "As technology has progressed, the aspen has become very important," Hance says. The increased demand for aspen allows the use of what now is one of Minnesota's most abundant trees.

Federal forest planning and the concern about the state's supply of timber prompted the 1981 Legislature to undertake another first: a statewide inventory and management plan for all of Minnesota's state forests. "Planning used to be an inherent part of each job," Hance says, "but never before had there been a plan on all aspects of all the state forests."

Though Minnesota never again will have the sweeping pine forest it once had, it has retained a significant share of its wooded lands. Each year, Minnesota forests produce more than \$650 million worth of raw products and \$2.3 billion worth of paper, lumber, and other finished products. Forests help meet the demand for recreation, too. State forests include about 60 campgrounds, more than 30 picnic grounds, about 70 miles of hiking trails, more than 50 miles of skitouring trails, and nearly the same miles of horseback trails. Moreover, state forests are used extensively for hunting and fishing.

The multiple-use of forests — for timber, wildlife, recreation, and other purposes — "was drilled into us at school," says Prout, who graduated in 1923. "The forest was a living thing that did all things for man."



Half century saw modern machines replace lumberjack, aspen replace white pine.



Halting the Flow of Public Waters

n the early days, they went crazy over draining swamps in this state," says former commissioner Chester Wilson. "It's a shame. An immense part of the state's wetlands had already been drained."

Minnesota was once blessed with water - in all, between 10 million and 12 million acres, most of it in the form of potholes, swamps, and other wetlands. Farmers and other settlers. however, viewed water as inconvenient, even harmful. One judge wrote in 1887: "Surface water is a common enemy, which an owner, in the necessary and proper improvement of his land, may get rid of as best he may." Because of this attitude and the frenetic pace of drainage, the state now has about two million acres of water. In only a little more than a century, we have lost as much as 90 percent of our wetlands.

Though we now recognize the values that flow from our small wetlands, the urge to drain, like a noxious weed, defies all attempts to trim it back. "We were the Division of Drainage in the 'twenties and 'thirties," says Dave Milles, Division of Waters hydrologist. "Historically, the state has promoted the conversion of wetlands. That has been ingrained in landowners. That has been the biggest problem — the water-is-theenemy mentality that we created."

Two things helped change attitudes toward water. First, the Depression caused land prices to plummet and made drainage, at least for a few years, impractical. Second, the drought of the 1930s emphasized the need for water.

As some citizens realized the worth of wetlands — as breeding areas for wildlife and as natural sponges that sap the force of floods — many demanded an end to drainage. The Legislature responded with a host of laws that made the practice more difficult.

Perhaps the most important law, passed in 1937, decreed all "navigable" waters to be public that is, they fell under the jurisdiction of the department and a new permit system for drainage, appropriation of water, and stream or lake bed alteration.

Later laws also protected wetlands:

• Because of its changing role, the Division of Drainage and Water was renamed the Division of Water Resources and Engineering in 1941. The name was changed again in 1949 to the Division of Waters.

• The definition of public waters, and thus the protection afforded lakes, rivers, and other waters, was broadened in 1946.

 "Save the Wetlands" legislation, passed in 1951, was "probably one of the most far-reaching programs in Minnesota history," says John McKane, director of the department's Bureau of Information and Education. "Without that program, we would be looking at a biological desert." The law allowed the department to buy wetlands when "draining was rampant and machinery was getting larger and larger," McKane says. So far, more than a half million acres of wetlands have been protected through the program.

• Wildlife gained legal standing in 1955. A new state law declared that the "conservation of soil, water, forests, wild animals, and relate resources" must be considered in drainage issues.

In 1976, lawmakers established the state Water Bank program to compensate landowners who agreed to preserve unprotected and potentially valuable wetlands.

Today, Division of Waters personnel are conducting a statewide inventory of waters to determine which are "protected" under the most recent legal definition of public waters. The goal of the inventory besides clearing a legal issue that has been cloudy since statehood - is to protect permanently many of the remaining wetlands in the state. Hydrologist Milles estimates that, when the inventory is finished in 1982, the "protected waters" will include a little fewer than two million acres of lakes, rivers, streams, and wetlands - only about 15 percent of what once was an abundant natural heritage.

Drainage taught citizens and officials that it is unwise to squander water or to tinker radically with nature. The lesson was reinforced by several other issues that became the responsibility of the Division of Waters.

The establishment of the Water Appropriations Program in 1947 was the first step in striking a compromise among all the competing uses for water. It has affected many - from taconite companies drawing water from creeks to farmers pumping groundwater for irrigation. In 1950, the division began the formidable task of mapping groundwater and surface water in the state's 39 major watershed. It was a 12-year job. Because of the comparatively early start, "our program is more complete than that of a good many states," says Waters Division director Larry Seymour. Water appropriation permits now cover the use of more

than 15 billion gallons of groundwater and surface water each year.

Another responsibility of the Division of Waters has been the regulation of dams. The issue was most controversial in the early days of the department, as this blistering retort by Gov. Floyd B. Olson in 1933 indicates: "Proposals for further construction of dams in the northern border lakes region...merit the opposition of all conservationists....Commercial exploitation in the past has despoiled our forests, marred our landscapes, and dissipated our resources."

The dams Olson condemned never were built. During the 1950s and 1960s, utilities and other industries lost interest in hydro projects. During the recent energy crunch, however, there has been new interest in hydroelectric power. A case in point: The division now is considering a proposal to reactivate the Sandstone Dam on the Kettle River, which has not been used for power since 1963.

Division policies toward flooding also reveal changing attitudes. The traditional answer to major floods has been to build major dams at major expense. Ditching and channelization, other typical responses, drain water more quickly and push flooding downstream, where problems become worse than ever. Recently, however, state and federal governments have tried a different approach. Since 1969, when the Legislature adopted a flood-plain management program, the Division of Waters has tried to prevent flood damage by discouraging

developments on flood-plains. According to Seymour, the program was a "major milepost that switched the emphasis to learn to live with floods rather than to prevent them, which we have learned is not practical."

One of the most pressing waterrelated problems since World War II has been the burgeoning development of "cracker-box lots" and seasonal homes that has created "shoreline blight," says Seymour. Inadequate sewage systems began to sully once clean lake waters. The response was the Shoreland Management Act of 1969, which is administered by the Division of Waters and sets standards for communities to follow in zoning lakeshore and riverside property.

Despite the drainage and early destruction of many of our wetlands, Minnesota is still rich in water: some 20,000 lakes and wetlands larger than five acres, more than 25,000 miles of streams, 90,000 miles of shoreline and abundant stores of groundwater. Managing that water is a complex, controversial job, and one that began slowly. Gradually, however, Minnesota has abandoned its "pioneering spirit" in favor of "considering all benefits that accrue to people," says Seymour. The public has opted to use water resources carefully, he says, and "to preserve what is remaining and what is worthy of preservation.'



The DNR has waged a continuing battle to protect Minnesota's resources, wetlands for wildlife and groundwater to irrigate croplands.





Exploring Our Mineral Bounty

hen Minnesota became a state in 1858, little was known of its mineral wealth. Ojibway Indians told the legend of Mesaba, the red giant of the underground world, but settlers hardly realized the extent of rich iron deposits in the northern part of the state. In 1865, rumors of gold spread, and speculators rushed north in a futile search, completely oblivious to the real riches lying hidden there. Only 20 years later did iron mining begin. In 1884, the first iron was shipped from the Vermilion Range near Ely. In the 1890s, the Mesabi Range opened.

During the heyday of iron mining, the state auditor's office was responsible for leasing and managing Minnesota's mineral lands. Because of a series of inept and possibly fraudulent transactions that cost taxpayers millions of dollars, the auditor's mineral leasing responsibilities were abolished in 1907, restored with revisions in 1921, and transferred to a commission in 1925. In 1931, the Division of Land and Minerals was formed under the Department of Conservation. The division now administers 10 million acres of state mineral rights, primarily in northern Minnesota.

In 1931, there was great concern about the future of iron mining. A University of Minnesota official predicted the rich natural ore would be exhausted by 1970. The challenge to industry and the state was to find a way to use the still-abundant lowgrade ores.

Actually, a firm had built a plant near present-day Babbitt in the early 1900s to make use of taconite, an ore with only 30 percent iron, about half the richness of the rock then being mined. But the results of the experiment were scant marketable ore, terribly high costs, and a ghost town.

Nonetheless, the 1931 Legislature authorized funds for a research lab to test low-grade ores and, ten years later, amended mining and tax laws to favor the development of taconite.

The first taconite from state land was loaded for tests in 1945. In 1951, Reserve Mining Company began building a pilot plant, the first successful facility for processing the low-grade ore. The continuance of Minnesota's iron industry was thus assured. There now are eight plants with a production capacity of more than 65 million tons of taconite pellets a year. An estimated \$4 trillion worth of useable and accessible taconite remains in the ground.

The same Reserve Mining Company that pioneered taconite production was at the root of one of the thorniest, most notable, and longest-running controversies the DNR Minerals Division has become embroiled in.

The issue began in the late 1940s when the state granted Reserve a permit to discharge taconite tailings into Lake Superior. Public outrage grew during the late 1960s and early 1970s as Reserve dumped 67,000 tons of tailings into the lake each day. In 1973, the federal government announced that asbestos-like fibers in the tailings might cause cancer. Years of litigation followed. Not until 1980 did Reserve switch to an onland disposal site.

Just as early gold miners overlooked iron, early iron miners overlooked other mineral treasures. But, in 1948, copper-nickel deposits were discovered along the South Kawishiwi River near Ely. Interest in minerals other than iron soared. During the seven years after the first copper-nickel lease sale in 1966, the Minerals Division issued 1,044 leases on more than 425,000 acres in northern Minnesota. AMAX Exploration, Inc. is preparing to build a \$50 million pilot plant near Babbitt. Though no copper-nickel ore has been mined commercially, the leases have earned the state \$1.5 million.

The 1948 discovery "got people thinking to look in Minnesota for minerals in general rather than for iron ore in particular," says Elwood Rafn, Director of the Minerals Division. Prospecting and drilling for uranium began in the 1950s and continues today, especially in Pine, Carlton, and St. Louis counties and in scattered areas in southwestern Minnesota. Says Rafn: "If you were to look at a map of Minnesota that shows the areas of interest 20 years ago, 10 years ago, and today, you would see how interest is spreading."

One of the most persistent issues facing the Minerals Division has been peat mining. "Somebody always had the idea that there are these enormous peat bogs in Minnesota up north and that they ought to mine the peat for fuel," says Chester Wilson, Commissioner of Conservation from 1943 to 1955. Nothing much came of the proposals, however, except for farming some peat lands and the extraction of some peat for horticultural "peat moss."

But in 1975, Minnegasco, which was experimenting with peat gasification, applied to the Minerals



Tower Soudan, last underground iron mine, closed in 1967.



Peatlands for fuel and other uses: An idea talked about for 40 years.

Division for leases on 200,000 acres of peat land. The economic effect could be enormous. Minnesota, which has more peat than any state except Alaska, holds about 7.2 million acres of peat land, the equivalent of about 16.1 billion tons of air-dried peat. The division redoubled its efforts to develop peat policy and to research the environmental effects of large-scale



Iron ore has helped make Duluth one of the country's busiest seaports.

peat mining. The research and discussion continue today.

Though the discovery of new mineral deposits has affected the Minerals Division, increasing public concern about the environment has had perhaps an even greater effect. The division has had to consider the long-term environmental impact of mining. When Rafn started with the department in 1949, the division hired chemists and engineers people with backgrounds related directly to mining. "Today," he says, "about half our people have other backgrounds," including biology and hydrology.

Some of the most significant Minerals Division decisions came in 1973 as a result of the environmental movement. Here are a few:

• A federal judge ordered Reserve Mining to stop dumping tailings into Lake Superior.

• A moratorium was placed on more copper-nickel development until leasing and mining policies could be determined.

• The 1969 mine land reclamation law was amended "to put some teeth in it," says Rafn.

 The state Environmental Quality Act required environmental impact statements for major developments.

"It is no longer just a case of what's the cheapest way of doing it, period," says Rafn. "The environmental awareness movement has had quite an impact on how we do business."



They Used to Call Them Game Wardens

fter Game Warden Norman Fairbanks was murdered in a trapper's cabin on April 24, 1930, other wardens and Itasca County sheriff's deputies searched the woods for the gunman. The hunt continued until June 26, when a posse of deputies, wardens, mining company police, and volunteers cornered two suspects near Greaney. One of the two was killed in the shoot-out, but the other was arrested and charged with the Fairbanks murder. Despite his confession, the man was acquitted. He later served twoand-one-half years in prison on unrelated burglary charges.

"That was just an example of what we were up against trying to enforce the game and fish laws," says Chester Wilson, a former commissioner. "There were too many friends of the outlaws in the north woods."

Though the state's first game and fish laws were passed soon after statehood, enforcement fell to local officials, and the law was ignored. A chief game warden was put in charge of enforcement in 1887, and a chief fish warden was appointed in 1889, but attitudes changed slowly. Even after the wardens were organized under the division of Game and Fish in 1931, local juries and citizens in outstate communities considered game and fish laws unnecessary and game wardens themselves an intolerable nuisance.

"A game warden's life meant less to an Itasca County jury than a few dollars worth of goods taken from some country cabin," wrote historian and sociologist Julius F. Wolff.

That sad fact was true in much of rural Minnesota. When juries did convict game-law violators, they frequently refused to levy significant penalties. The number of people willing to report neighbors who poached was negligible.

The work was particularly difficult for an officer in his home town. Tact was part of a warden's skills. "You treat them firmly and fairly," recalled Francis Johnson, who became a warden in 1929 and retired in 1973. "Always use a pleasant tone of voice, because you weren't appointed by the Lord to these things.

"Whenever you hear someone say what a good game warden someone is, you'll generally find they are active in public affairs and respected for it," Johnson continued. "I often advised new wardens to think that, when they met with a member of the public, they someday might be on a jury hearing one of his cases."

Over the past 50 years, the public's attitude toward wardens has changed. "Our cooperation has improved year after year," says Fred Hammer, the present director of the Division of Enforcement. "That old attitude is disappearing. The close-knit rural society isn't so close-knit anymore. And there are so many more people partaking in natural resources, they aren't going to let one person hog it all."

That change in attitude is evident in the rising conviction rate for natural resources violations, which now is greater than 95 percent.

Despite these evolving attitudes, however, the warden's job has become more and more complex. Besides enforcing game and fish laws, officers now must work on water pollution cases, police hiking and snowmobile trails, keep order in parks, enforce regulations designed to protect public waters, train people in the use of firearms and snowmobiles, assess storm damage, fight forest fires, develop and maintain public boat accesses, and manage wild rice harvests. In 1969, the title of warden was changed to conservation officer to include these new responsibilities.

The number of officers has not nearly matched the growing number of regulations they must enforce or the number of people they must watch. For example, in 1906, there were fewer than 30,000 licensed deer hunters and 120 game wardens and deputy wardens. Now there are ten times as many deer hunters and two million anglers. About 600,000 boats and 270,000 snowmobilers are licensed. Yet only 142 conservation officers cover the field — one officer for every 378,898 acres, fewer than two wardens per county.

Conservation officers have met this challenge through better training and better equipment. "When I began, they swore you in, gave you a gun, and sent you out," says Bob Hodge, an officer since 1950. "Now we hire only licensed police officers."

As in police work, "you're only as good as what you see," says Hammer. By expanding their field of vision, officers have kept up with the boom in recreational activities, people, and duties.

In 1947, the Warden Service took to the air and began flying its first airplane. That same year, two-way radios were installed in wardens' cars.

"The lab work is really where we've come along," Hammer says. Sophisticated equipment and chemical analysis help to convict poachers. Researchers can determine whether fillets belong to a walleye or smallmouth bass, whether a cut of venison is from a Minnesota deer or a white-tail killed farther west, or for how long a carcass has remained frozen. A relatively new technique allows officers to determine in the field if blood spots on clothing, for instance, are from a deer or a domestic animal. Recently, when officers arrested boaters on the Minnesota River. lab tests verified that their catch of catfish was taken with illegal shocking equipment and not with a rod and reel.

Despite the new equipment, the CO's job is still filled with a derringdo that distinguishes it from other natural resources work. Hodge recalls that, when he was a pilot in Ely, he and his partner spotted an outlaw who used a machine to harvest thousands of pounds of wild rice a night. Hodge banked the plane, dropped onto the lake, and taxied up to the machine. "My partner jumped into the water - man, it was cold and grabbed the side of the boat," Hodge recalled. "After a brief struggle and lots of water-splashing, we hauled the rice poacher into the plane and placed him under arrest."



Game wardens seized 129 beaver, otter, and muskrat pelts in a 1942 raid on poachers.



Goal: Let All Enjoy Miles of Rivers and Woodland Trails

n Minnesota, the "Land of 10,000 Lakes," residents long have overlooked state rivers. During the last 10 to 15 years, however, people began taking to rivers and streams in canoes, boats, kayaks, rafts, inner tubes, and interest in our rivers and streams has grown enormously.

The Legislature responded by adding several streams to the state canoe and boating route system, a program begun in 1963 to allow the DNR to build campsites, accesses, and rest areas along Minnesota's beautiful boating rivers. Today, 18 streams are designated canoe and boating routes — some 2,200 miles of river in all.

In 1973, the Legislature passed the state Wild and Scenic Rivers Act. Through that program, some of the state's most beautiful and historically important streams have been protected from intensive development through a combination of zoning and land and easement acquisition. In 1975, the Kettle River in east-central Minnesota became the first state wild and scenic river. Now, stretches of six streams — 440 miles of river — are protected.

Over the same period, the DNR began developing a statewide trails system — short stretches of trails within state parks, forests, and other areas. In 1967, snowmobile registration fees were first used for the extensive development of snowmobile trails. In 1971, a grantsin-aid program for snowmobiles began.

During the late 1960s and early 1970s, a few corridor trails — long distance trails for a variety of uses were authorized. But the biggest step in trail development came in 1973, when the Legislature authorized 13 corridor trails, allowed the DNR to hire people to work on the program, and provided money for acquisition and development. The

Commissioner of Natural Resources was also authorized to buy abandoned railroad rights-of-way to complete corridor trails. The corridor trails will stretch for more than 1,400 miles when they are completed.

Rivers and trails, once managed by the Division of Parks and Recreation, were transferred to a new office, the Trails and Waterways Unit, in 1979.

All people can thus enjoy Minnesota's woods and waters.



Trails offer winter recreation.



Managing Our Game and Fish

he lore of early Minnesota is filled with references to woods alive with game, skies dark with birds, and waters rippling with fish. Passenger pigeons flew, not in flocks, but in clouds. Buffalo once roamed east of the Mississippi. Northern pike were monstrous and plentiful. Then something happened.

Market hunters shot game with an inventiveness and vengeance that more closely resembled war than hunting. Commercial fishing depleted fish numbers. The attitude of pioneers — that game and fish belonged to whoever could get the most — further doomed some species. The loss of wildlife habitat to logging, farming, and pollution threatened to make the abundance of Minnesota's wildlife little but a memory.

The state seriously undertook the protection of its wildlife in 1874, the year it created a three-person fish commission. Two years later, Minnesota's first fish hatchery was established at Red Wing. In 1887, the post of chief game warden was created and, two years later, the position of chief fish warden.

Thus, in 1931 when the Game and Fish Commission became part of the Department of Conservation, game and fish management had already begun. In some regards, it began too

Craig Borck

late: the passenger pigeon was extinct; buffalo, elk, caribou, and cougar had gone west; carp infested Minnesota waters. The challenge was to prevent further loss. Anglers complained, as always, that fishing wasn't what it once was. Water pollution was being recognized as a serious problem. Waterfowl were suffering from over-hunting and the destruction of habitat.

Warned one writer in a 1934 issue of the *Conservationist*: "If the excesses of gunners continue to the point of crowding many important game species toward extinction, the non-shooting element may rise up in righteous indignation and disarm us all."

Fish

To restore and protect state fishing waters was particularly important. Hardly another leisure pursuit rivals fishing for popularity or economic impact. Each year, some two million people grab their rods and head for a Minnesota lake or river. They keep 25 million fish weighing 30 million pounds — the equivalent of more than 100 boxcars packed full of fish. Anglers generate \$520 million worth of business a year — \$20.80 per fish.

The new Department of Conservation intensified artificial propagation. This Fisheries Section of the Division of Fish and Wildlife, as it's now called, today operates 18 hatcheries to raise trout, muskies, and walleyes. The division stocks more than 250 million fish, 90 percent of them walleyes, Minnesota's most prized game fish. During the 1930s, lake trout were raised to maturity to provide eggs for stocking.

Some other notable achievements:

• Studies of large walleye lakes, begun in 1939, have described how fishing pressure affects fish populations and catches.

• During the 1940s, dozens of walleye rearing ponds were built to keep walleyes until they reached fingerling size. Previously they had been released as fry, and mortality was much higher.

● In 1945, researchers discovered that a lake's productivity is related to water chemistry and that there are limits to the number of fish a lake can produce.

Sea lampreys were discovered in Lake Superior in 1946, and within seven years lake trout nearly disappeared. The Fisheries Section worked with the federal government and agencies from other states to control lampreys in the streams where they spawned. Through the use of selective poisons and barriers. sea lamprey numbers were reduced, and lake trout have made a comeback. Nonetheless, Minnesota, like other Great Lakes states, has planted chinook, coho, and Altantic salmon to bolster fish numbers. "Now, in 1981, we're seeing lake trout and salmon coming back to somewhere near original numbers," says Fisheries chief Jerry Kuehn.

• The federal Dingell-Johnson Act of 1950 allowed an excise tax on some fishing equipment. The money could be used by states for fisheries management.

• In the early 1950s, creel censuses on a dozen lakes enabled the Fisheries Section to estimate the annual take from state waters.

During the 1950s, the section also began stocking rainbow trout in North Shore streams and improving trout streams along the North Shore and in southeastern Minnesota. Now, about 60 miles of streams are improved each year. Since 1950, the section has protected northern pike spawning areas through land and easement acquisition. Since 1953, fisheries workers have used pumps and traps to rescue northern pike threatened with winterkill. In 1955, the Fisheries Section began poisoning cold-water lakes and restocking them with stream trout.

One of the biggest advances in fisheries, Kuehn says, has been the improvement in state rivers — a result of public demand for cleaner water and an array of water pollution laws. Thirty years ago, he remembers, the Mississippi "was unfit to touch, much less to fish in or to eat fish out of. It has improved vastly to the benefit of a variety of species and a variety of habitat. It's a smorgasbord of Minnesota fish."



For 40 years, fisheries workers (above) have "stripped" walleyes of their eggs. After hatching in state hatcheries, the young are released into lakes (right).



Similar stories can be told of the lower St. Louis River near Duluth and of other state streams. The 1969 Shoreland Management Act has helped, Kuehn says, by preventing overdevelopment and consequent eutrophication of lakes. Nevertheless, water pollution remains a problem. Particularly since World War II, a multitude of poisons, including lead, mercury, and PCBs have contaminated streams.

Wildlife

In 1931, restoration of the 7.000acre Thief Lake Wildlife Management Area in Marshall County began, and the Whitewater Wildlife Management Area was established. These and other wildlife management areas have remained vital over the past half century. Even though the department relied on game refuges and stocking to maintain animal populations, "by the 'fifties, it was obvious that habitat was the key to management," says Wildlife chief Roger Holmes. The Save the Wetlands program was established in 1951 to acquire wetlands for wildlife management areas. Through the use of federal Pittman-Robertson funds, which come from a tax on hunting equipment, the department has acquired 520,000 acres. Today the state's 925 state wildlife management areas are the "largest and most important habitat programs we have," says Holmes.

The Pittman-Robertson fund is only one source of money for wildlife projects. In 1957, a surcharge on small-game licenses was approved to raise money to buy land through the Save the Wetlands program. Since the Migratory Waterfowl Stamp was approved by the Legislature in 1977, the state duck stamp has raised an average \$350,000 a year.

In 1980, the Nongame Wildlife Fund was begun. Taxpayers donated \$725,000 the following year to manage and study nongame species. The program, says one official, "demonstrates the department is not just a fish and game sort of thing."

Several other laws greatly affected wildlife management in Minnesota:

• In 1943, the Legislature empowered the conservation commissioner to set hunting seasons and limits within broad guidelines, taking some of the politics out of game management.

● In 1965, Gov. Karl F. Rolvaag vetoed a controversial bounty bill. Since then there have been no bounties on Minnesota predators, and the \$400,000 a year previously spent on bounties has been put to better use.

• A 1967 law allowed the department to spend money to improve wildlife habitat on private land.

• The state Water Bank program, approved in 1976 complemented a federal program of the same name and helped restore wildlife habitat in agricultural areas. Partly because of advances in wildlife management, some species have made a comeback or have been established anew.

For example, until recently there never had been a documented sighting of a wild turkey in Minnesota, Holmes says. All attempts to establish the turkey with pen-raised birds failed. Finally, in 1962, 69 birds that had been trapped in the Ozarks and other Midwestern areas were released in southeastern Minnesota. The region now harbors some 5,000 turkeys. The state's first turkey season opened in 1978.

Mallards, wood ducks, and Canada geese are more common now than they have been at any time during the last half-century, Holmes says. The case of the giant Canada goose "is a classic," Holmes adds. Once thought to be extinct, the bird was "rediscovered" in Rochester in 1963. Regulating hunting, protecting refuges, and establishing new nesting sites (by private groups as well as state and federal governments) have encouraged the geese to make a comeback. Sportsmen's groups, too, have established breeding flocks throughout the state. Now an estimated 35,000 giant Canada geese comprise the Rochester flock alone.

Says Holmes: "For the first time in memory, the Canada goose is a common sight in Minnesota."



DNR wildlife biologists perform research projects on both game and nongame wildlife. Hunters benefit, and nongame species find suitable habitat in Minnesota.



1931-1981: The People Speak

he Department of Natural Resources could not do its job without public cooperation. Indeed, the department never would have been formed in 1931 except that the public demanded that a single agency manage the state's natural resources. Then, the most concerned and influential groups were state and local rod and gun clubs. Now, however, there are hundreds of conservation groups that work with the department, many of them concerned with issues much broader than hunting or fishing. "With Earth Day, there was a public awakening," says former commissioner Robert Herbst.

People who aid the cause of conservation range from the person who leads officers to a game poacher, to the person who lobbies on his own for a conservation issue, to the person who sits on a public board that is wrestling with a natural resources issue.

The work of individuals and corporations, though often unpublicized, has often been the most enduring. During the last half-century, companies and citizens have donated more than 20,000 acres to the state for parks, wild and scenic rivers, wildlife management areas, and other projects.

Among the many groups that often work in league with the department are the Izaak Walton League, the Sierra Club, the Audubon Society, The Nature Conservancy, Muskies, Inc., The Minnesota Public Interest **Research Group**, Trout Unlimited, the Steelheaders Association, the Northern Environmental Council, Clear Air-Clear Water Unlimited, and many others.

The ways in which these groups work is just as diverse. Some give recommendations and act as "sounding boards" or "watchdogs of departmental activities," Herbst said. Others are frequently partners with, or foes against, the department in litigation. Many try to sway lawmakers in the halls and offices of the Capitol. Others help in more unusual ways.

For example, there might not be a state Migratory Waterfowl Stamp and all the money it raises if it weren't for the Minnesota Waterfowl Association. That group proposed the idea, guided it through the Legislature, and, after it was vetoed in 1976, persistently saw it through to adoption in 1977. "That was a real significant effort, and they did it practically themselves," says Wildlife chief Roger Holmes.

It was the Fort Snelling State Park Association, a private group — not the DNR — that pursued legislation and raised more than \$200,000 to buy land and establish a park in the midst of the Twin Cities.

Employees from REI Co-op, a Bloomington sporting goods store, have scoured the cliffs along the St. Croix River in Interstate State Park to pick up cans and other trash left by less considerate visitors.

The creation of Tettegouche State Park in 1979 was an example of two kinds of citizen groups in action. The Nature Conservancy held an option to buy Tettegouche, a 3,400-acre area bristling with cliffs and outcrops, dotted with lakes, and laced with creeks along the north shore of Lake Superior. The Conservancy, not saddled with procedures that delay acquisition, was able to work more swiftly than the department in procuring the option.

Nonetheless, the group could not afford to hold the property. The department, meanwhile, proposed to the Legislature a Tettegouche State Park, and the Sierra Club persuaded legislators to approve the plan before the option to buy expired. The result was a new state park (which absorbed the existing Baptism State Park) and a land exchange that returned some forest lands in the surrounding area to private hands.

These are only recent examples of citizen participation in conservation. The department's partnership with citizen groups, vital to the creation of the department 50 years ago, has grown through time. Without public demand for good conservation practices and without spirited citizens willing to work for their beliefs, little in the vital area of conservation of natural resources in Minnesota would have been accomplished.



