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Nelson T. French

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Preserving Minnesota's Natural Heritage

NELSON T. FRENCH

Introduction

Minnesota has a rich natural resource base that can be preserved only by maintaining and expanding private and public conservation programs that contribute toward the protection of forests, soils, waters, native plants, wildlife, natural communities, and endangered species. Although efforts to protect Minnesota's natural heritage have been a model for the Midwest, increasing pressure to plow up prairie, drain wetlands, consume old growth forest resources, and urbanize the landscape continue to erode an ever-decreasing base of natural habitat. Significant alteration of our state's presettlement biological communities has occurred and, in spite of conservation laws and rules adopted over the last 50 years, alteration and destruction continue at an alarming rate. We cannot rest on our laurels, nor can we feel our efforts are sufficient simply because we are doing a better job protecting our natural heritage than are neighboring states. Public and private agencies must inventory their existing land base and private lands to identify existing remnants of natural communities and seek appropriate legal protection for these areas. Efforts to restore presettlement natural communities need to be greatly accelerated. Protection of larger landscapes will be required to insure perpetuation of our diverse plant and wildlife populations and communities. Local government is in a unique position to facilitate conservation and preservation of our most precious resources and improve water quality, while allowing for appropriate economic development. Conservationists are acting locally to bring the public's concern with preservation of our natural heritage to the attention of decision-making bodies at the county and township level. The citizens of Minnesota have an opportunity to seek appropriate actions to preserve natural ecosystems by the year 2000 and recommit to Minnesota's state environmental policy adopted by the legislature in 1973.

Presettlement Minnesota: A Diverse Landscape

Three hundred years ago Minnesota's fish, wildlife, native plants, and the natural communities supporting them required no formal protection of management from private or public organizations. Vast grasslands were alive with bison, prairie chickens, antelope, and radiant blooming wildflowers; lakes and rivers were teeming with bass, walleye, and sturgeon; and massive flocks of waterfowl and other migratory species produced thunderous, deafening roars around numerous prairie pothole lakes.

Presettlement Minnesota contained a wide array of ecosystems supporting over 2,500 species of vascular plants and higher animals. This impressive diversity reflected the meeting of three major biomes (Figure 1) in Minnesota: the northern coniferous forest; the eastern deciduous forest; and the tallgrass prairie.

Significant alteration of our state's presettlement biological communities has occurred and, in spite of conservation laws and rules adopted over the last 50 years, alteration and destruction continue at an alarming rate.

Minnesota's native biological communities and vegetation types have been defined by complex interactions between climate, soil, landform patterns, and natural disturbances such as glaciers, fire, and drought. When present climate conditions were established in the post-glacial period, Minnesota was located at the point of continental transition between forest lands and grasslands. The natural vegetation extended from the dense coniferous and northern hardwood forests of northeastern Minnesota, through the transition zone in which oak and maple-basswood forests gave way to the mixture of hardwoods and the prairie to west and southwest. Rough estimates are that in presettlement times approximately 66 percent of Minnesota's 54.7 million acres was under forest cover of some type and 34 percent native prairie.

A more detailed analysis resulting from overlaying vegetative cover with other ecological and geological characteristics allows further delineation of some 18 landscape regions covering the state. Each of these areas has distinct characteristics worth protecting through a variety of mechanisms.

Alteration of Minnesota's Landscape

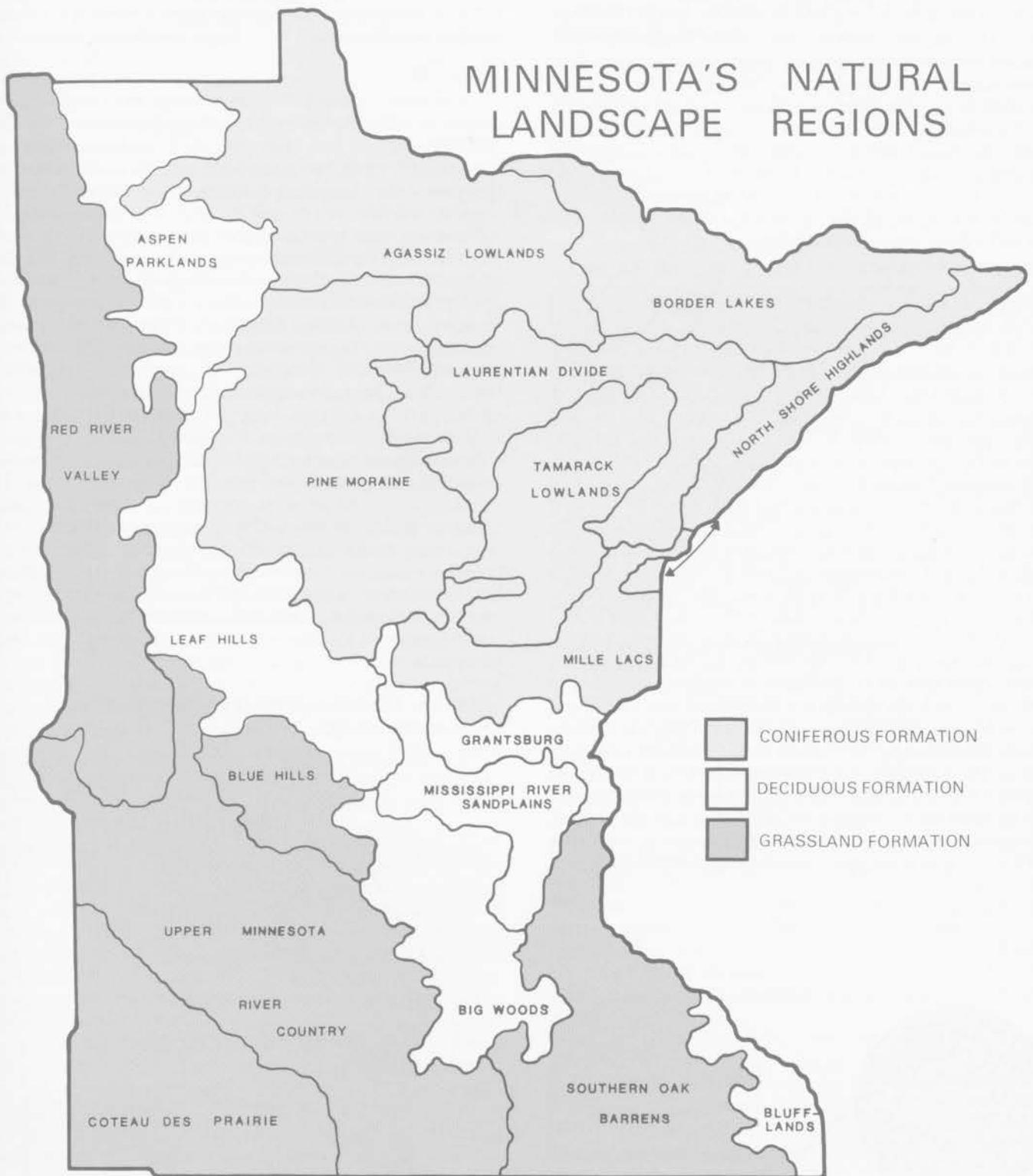
Only more recently, in the last 150 years, have alterations induced by settlement patterns been a significant factor in shaping Minnesota's landscape. Today, after more than a century of European settlement, nearly all the biotic communities composing Minnesota's three biomes have been substantially altered. Only small remnants of most of the state's original landscape remain in relatively natural condition.

Prairie

After millennia of evolution Minnesota's tallgrass prairies were transformed within half a century by European settlers to the prime agricultural lands of Minnesota. The rich soils and unbroken spaces lured hungry settlers and were quickly

Nelson French is director of government relations for the Minnesota field office of The Nature Conservancy.

MINNESOTA'S NATURAL LANDSCAPE REGIONS



Source: A Guide to Minnesota Prairies, Keith M. Wendt, copyright 1984, State of MN Dept. of Natural Resources; map by Judith M. Jacobi

Figure 1. Minnesota's ecological diversity is promoted by three major biomes.

exploited for human use. Existing plants and animals gave way to new species that were either cultivated by humans or were able to adapt to the conditions made by humans. As a result, the natural, or "true," grasslands in Minnesota all but vanished. The vast tallgrass prairie that once covered a full one-third of the state, nearly 18 million acres, has been reduced to less than 150,000 acres -- more than a 99 percent loss. The remaining prairie tracts range in size from less than an acre to several thousand acres. Protection of these areas is necessary to provide future generations with an opportunity to view the natural landscape and is critical for scientific study of the natural and genetic diversity of the plant and animal inhabitants. Figure 2 shows the amount of native prairie remaining in Minnesota in 1989. Approximately one-half, about 75,000 acres, of the remaining prairie resource has been afforded formal protected status.

Forests

Minnesota's forest resources have undergone significant alteration in settlement times. Early settlers expanded the prairie frontier to the north and east by removing extensive acreages of hardwood forests from the forest-prairie transition zone. A prospering lumber industry, which began along water courses, was extended as the railroads opened up new land to development. By 1890, the State's forest land base had been reduced by 5 million acres and today, only one-half of the State's original forested land base remains in forest cover, and not much of this in an undisturbed state. Much of this land has been and continues to be managed to support the healthy, and expanding, forest industry which produced 4.5 million cords of wood and employed 51,000 workers with a payroll of some \$1.4 billion in 1986. The total economic impact of forest products activities in Minnesota approached \$3.8 billion in that year, making it the third largest manufacturing industry in the State. Environmentalists are beginning to raise questions about the future of Minnesota's forests in light of tremendous expansion in forest product activities and the resulting increased demand for wood in the past 10 years. Among other things, the conservation community believes that serious consideration for protection of biological diversity and remaining forest natural areas must occur in concert with this increased economic activity. The largest contiguous area of climax deciduous forest - the Big Woods - is now restricted to small, scattered islands of forest

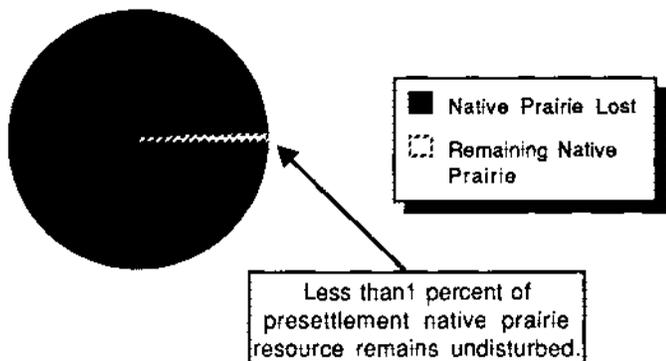


Figure 2. Native Prairie Loss in Minnesota.

surrounded by croplands. The great stands of pine that once defined the north woods have been converted to essentially pure forests of aspen and birch through logging which began in the late 1800s. The remnants of some of the most disturbed northern forests have been described by Searle as a "legacy of abandoned tote roads, railroad grades, dams, and cutover lands that plagued the region for half a century (1)."

Wetlands

More than 72 percent of Minnesota's original wetlands, and nearly all of the prairie wetlands, have disappeared from the landscape in the last 130 years. Many millions of acres of wetlands fell victim to state and federal policies that for all too long encouraged drainage and development at a tremendous cost to wildlife, water quality, and Minnesota taxpayers (Figure 3). It is estimated that Minnesota contains some 70,000 miles of public and private drainage ditches. Not only have these drains eliminated millions of acres of wetlands and related wildlife habitat, but a high percentage of the remaining wetlands are affected by these existing drainage networks. Unfortunately it has been estimated that between the years 1980 and 1990, nearly 10 percent of the remaining wetlands in the prairie region will have been drained -- an alarming 5,000 acres per year alone in this region of the state.

Although blessed with an abundance of natural resources, Minnesota's remaining native habitat continues to disappear at an alarming rate. As of this writing approximately 287 Minnesota species are experiencing significant population decline and have been classified as state endangered, threatened, or special concern. Despite these significant and continuing losses, however, the remnants of native habitats in Minnesota still support the vast majority of plant and animal species present at the time of European settlement. This is an encouragement to those who strive to preserve these small remnants.

Historic Efforts to Preserve Minnesota's Natural Heritage

The decline of wildlife populations and habitat did not go unnoticed at the turn of the last century. Scientists and citizens alike were alerted to the need for efforts to "conserve" our natural resources. In response to increasing concern, Congress and the federal government began to regulate the

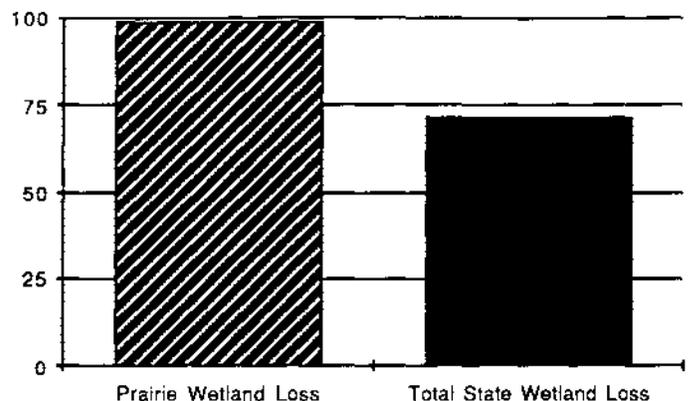


Figure 3. Majority of State's Wetlands Have Been Lost

taking of many species. State government also became increasingly involved in efforts to preserve forest, park, and wildlife areas. Proposals to establish large forest reserves for purposes of water and rainfall protection were floated at this time as well. In 1891, State Representative G. J. Lomen of St. Paul proposed a resolution calling for the creation of up to a 3 million acre national park on the Canadian border from Lake Vermilion to Lake of the Woods. The resolution was adopted and forwarded to the Congress, Secretary of Interior, and President, who took no action on it. The 32,000 acre Itasca State Park was established later in the same legislative session to save a remnant of the primeval pine forest within the Mississippi headwaters. Efforts to reintroduce "threatened" species like the elk and caribou also occurred in the early part of this century.

By the early 1900s both the federal and state government were taking action to set aside vast areas of land, mostly in northern Minnesota for forestry purposes. Much of the land set aside for the Superior National Forest and Chippewa National Forest had been significantly altered by logging activities and natural systems were already disrupted. The creation of the Minnesota Department of Conservation in 1931, coupled with an avalanche of tax-forfeited lands passed to the state by county board resolution, ushered in a new era of professional natural resource management at the state level of government in the mid-20th century, as more than one-half of the land base for present state forests and parks was established between 1930 and 1950.

The Minnesota Academy of Science, the Society of American Foresters, the Izaak Walton League of America, and other interested individuals initiated efforts to begin identifying "unique and natural areas" for preservation at this same time. In 1932, the federal government established Pine Point Research Natural Area (RNA) in the Chippewa National Forest, the first such area set aside solely for the purpose of protecting a unique natural community for its own inherent ecological values. This action was followed by the designation, at the request of the Minnesota Academy of Science, of the Itasca Wilderness Sanctuary in Itasca State Park in 1939. Approximately 2,000 acres of the park were set aside "to remain unaltered by man...the only portion of the park whose fate is determined by natural forces alone."

Increasing amounts of the lands in the public domain were being set aside for scientific and educational purposes. Areas such as Nerstrand Woods, the Cedar Creek Natural History Area, and the 22,000 acre Lake Agassiz Peat Land National Landmark were identified for management to preserve natural conditions. These actions marked the earliest efforts to identify and seek protection for Minnesota's most endangered natural resources. Still, far too many areas were being lost.

In June, 1954, Richard J. Dorer, Supervisor of the Bureau of Game, Minnesota Department of Conservation, initiated a crusade to "Save Minnesota's Wetlands." This effort was in response to three years of field work on a plan initiated in 1951 to spend \$6,500,000 to acquire 209,000 acres of agriculture zone wetlands described as "desirable privately owned potholes, marshes, bogs and non-meandered lakes in 900 townships of 65 counties." Dorer was pleased with the preliminary results achieved by July, 1954, when 11,235 acres had been acquired or optioned in 25 counties at a cost of \$340,000. Dorer's description of the situation and his plea continues to be delivered today. Dorer said we need the "foresight, the wisdom, the initiative, and the courage to demand of our duly elected representatives, the formulation

and the prosecution of a long-term program designed to assure the systematic restoration of the soils that have been depleted, and the desirable water areas or streams that have been destroyed or polluted..."

Conservation Lands — Public Land Ownership Today

Federal, state, and local government exert direct control through ownership of approximately one-fourth of the Minnesota land base. Approximately 22 percent of Minnesota's 54.7 million acres are owned by the public sector, most of which is located in 22 northern forested counties. Less than 1 million acres of public land occurs outside this area in the remaining 65 counties.

Approximately 3.7 million acres of natural resource land are under federal ownership; consisting of two national forests, U.S. Fish and Wildlife Service refuges and waterfowl production areas, one national park, one scenic riverway, two national monuments, eight national natural landmarks, and water reservoirs managed by the U.S. Army Corps of Engineers.

The Minnesota Department of Natural Resources, initially established as the Minnesota Department of Conservation in 1931, dominates state public land ownership with management responsibility on approximately 5.6 million acres, about 10 percent of the total state land area. These lands consist of 1,021 wildlife management areas (500,000 acres); 82 state parks, recreation areas and waysides (225,000 acres); 58 scientific and natural areas (15,000 acres); 56 state forests (3.1 million acres); and about 1.5 million acres outside of designated outdoor recreation units. This represents more than 97 percent of state-administered land.

Funding for Land Conservation

In 1963, the legislature enacted the Omnibus Natural Resources and Recreation Act and created the Minnesota Outdoor Recreation Resources Commission (MORRC). The charge given MORRC was to inventory and evaluate recreational and resource opportunities in Minnesota and obtain and appraise all studies, data, and reports previously prepared or currently in progress by public agencies, private organizations, and groups." The commission prepared reports on a menu of conservation concerns including Memorial Hardwood Forest, wildlife lands and wetlands, parks and recreation, water resources, scientific areas, and legislative and appropriation recommendations. The Legislative Commission on Minnesota Resources, funded in part by a portion of the state cigarette tax revenue, is the living legacy of this early effort to focus public attention on Minnesota's conservation needs.

In 1975, the Minnesota state legislature adopted the Outdoor Recreation Act which established the policy framework for refinement of the state's protection of the public land base. Among other things, the legislature found that "the unique natural, cultural, and historical resources of Minnesota provide abundant opportunities for outdoor recreation and education..., that the preservation and proper utilization of Minnesota's outdoor recreational resource is...increasingly important to the health, welfare, and prosperity of the citizens of Minnesota."

The legislature also initiated the Resource 2000 funding program in 1975, a major bonding program designed to provide the funds required to acquire lands for inclusion within the outdoor recreation system. Figure 4 shows the

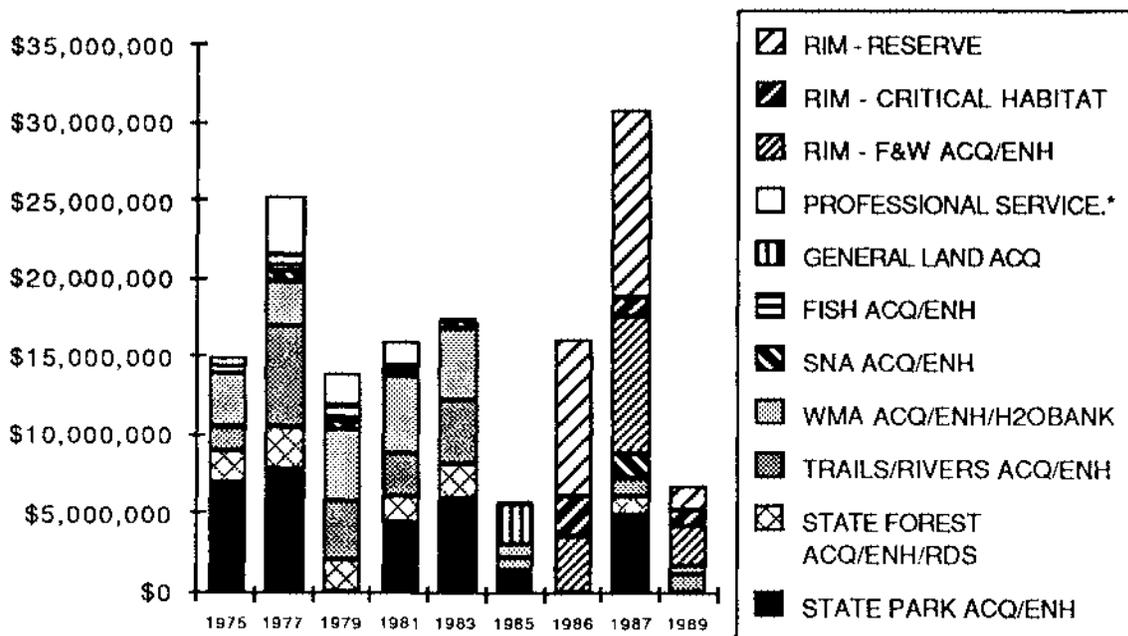


Figure 4. Minnesota Funding of Natural Resource Acquisition and Enhancement.

history of natural resource acquisition and enhancement funding through state general obligation bonds between 1975 and 1991. The program received an average of \$15.5 million every two years between 1975 and 1987. Note, however, that in 1985, only \$6.3 million was authorized for this program. The result of this decision by the legislature was to slow down acquisition of critical inholdings within state parks, wildlife management areas, and threatened natural areas. In addition, much needed enhancements, such as maintenance of infrastructure and construction of new visitor facilities and trails, were seriously delayed due to the scaling back of funding.

Reinvest in Minnesota — Fulfilling a Vision for a New Land Ethic

In 1984, a committee formed by Governor Rudy Perpich called for a major reinvestment in Minnesota's natural resources through the comprehensive Reinvest In Minnesota (RIM) Program. The commission found that Minnesota's fish, wildlife and native plant resources were under severe stress and requested immediate action by the legislature to fund efforts to preserve, restore, and revitalize forest, farmland, and aquatic habitat, and protect the state's soil and water resources. The report called for \$60 million per year for a 10 year period. This level of reinvestment was justified economically by evidence that Minnesota's natural resources produce significant economic activity and contribute upwards of \$1 billion to the state's economy annually.

A coalition of 50 agricultural, conservation, environmental, and sportsman organizations immediately endorsed the findings and worked closely with the Perpich Administration, legislature, and state agencies to create the RIM program in 1986, and succeeded in obtaining \$16 million for the program. The RIM Coalition continued to work for funding in both the 1987 and 1989 budget sessions.

Millions of dollars have been appropriated through RIM for natural resource protection, enhancement, research, wetland restoration, prairie protection, and retirement of marginal agricultural land through the RIM conservation reserve easement program. The RIM public-private sector critical habitat matching fund has been one of the most successful components of the program, stimulating \$3.7 million in private conservation action which is matched with funds appropriated by the Legislature.

Figure 4 shows the transition from Resource 2000 to RIM funding in 1986, 1987, and 1989. Although marketed as a new program increasing the state's commitment to natural resource funding, RIM merely resulted in applying the same amount of dollars (less in constant dollars) to an expanded conservation agenda. The RIM program added a significant additional component involving expenditure of funds to protect natural resources on private lands, including incentives for private landowners to set aside for conservation marginal agricultural lands that should not be in crop production. While RIM has been a successful initiative, it has not provided the increased funding required to properly reinvest in Minnesota's natural resource base.

Efforts to Identify, Protect, and Manage Minnesota's Endangered Natural Resources

In the early 1970s, the Minnesota legislature adopted a number of new laws in response to public demands to increase protection of Minnesota's air, water, and land resources. The 1973 Minnesota Environmental Policy Act was adopted "to declare a state policy that will encourage productive and enjoyable harmony between human beings and their environment;...to promote efforts that will prevent or eliminate damage to the environment and biosphere and stimulate health and welfare of human beings; and...to enrich the understanding of the ecological systems and natural

resources important to the state and to the nation." Among other things, this law called for the State of Minnesota to "preserve important existing natural habitats of rare and endangered species of plants, wildlife, and fish, and provide for the wise use of our remaining areas of natural habitation, including necessary protective measures where appropriate..."

In the mid to late 1970s, several programs consistent with this policy were established to inventory, protect, and manage Minnesota's most endangered natural resources. Initially these programs were supported by modest levels of federal funding of research work on federally listed endangered species, specifically the gray wolf and bald eagle. These programs have grown significantly in the last decade.

Natural Heritage Program

In 1979, funding made available by The Nature Conservancy and the Legislative Commission on Minnesota Resources (LCMR) created the Minnesota Natural Heritage Inventory Program within the Department of Natural Resources. The sole purpose of this program is to conduct field inventory and research on the numbers, condition, and distribution of rare plants and animals, ecologically sensitive plant communities, and other natural features now uncommon on the landscape and maintain an extensive database documenting their occurrences. In 1987, The Nature Conservancy and the Legislative Commission on Minnesota Resources initiated the Minnesota County Biological Survey, a detailed county by county inventory of endangered natural resources designed to expand the database and assist in setting conservation priorities and local planning efforts. Two years of field work in seven Minnesota counties has resulted in a doubling of the recorded elements in the heritage database.

Scientific and Natural Areas Program

Minnesota's state Scientific and Natural Areas (SNA) Program, established by the legislature to protect and manage natural ecological communities and unique natural resources, received a small operating budget in 1971 to initiate a program to establish a complement of natural areas to preserve Minnesota's biological diversity. This program has grown steadily and now consists of 58 designated natural areas totalling 15,000 acres.

Minnesota's Outdoor Recreation Act authorizes the designation of SNA units within state parks and state forests such as the Black Lake Bog SNA in the Nemadji State Forest and the Queens Bluff SNA in O.L. Kipp State Park. Management and dedication of existing state public lands for ecosystem value, though an important protection activity, has met with limited success. State parks have historically protected scenic and natural values of land within their boundaries, however, only recently have resource management personnel been charged with planning for the protection and enhancement of natural features within the parks. Natural ecosystem management also needs to be further developed in state forest land management practices. The forest planning process required under the Minnesota Forest Planning Act has been instrumental in promoting forest resource management decisions that recognize the need to designate natural areas within state forests. State wildlife management areas, although not available for formal natural area designation, contain extensive natural ecological communities. Management plans for these areas are being modified to take into account appropriate stewardship activities. Efforts to protect endangered natural resources on

these areas need to be enhanced. It is critical that identification and designation of SNA quality sites on state park and state forest land be conducted in the next decade.

Landscape Conservation

Conservation biologists are increasingly coming to the conclusion that to preserve biological diversity and the integrity of natural systems into the future we are going to have to focus increased attention on preserve shape, proximity to other preserves, landscape diversity, and size. The concept of preserving large landscapes of multiply zoned, multiply owned preserve complexes is not new to conservationists. As long ago as 1892, New York established the 6 million acre Adirondack Park, a successful effort to preserve the integrity of this beautiful area.

If we are to protect the full diversity of the prairie ecosystem in Minnesota, we will need to establish a network of small and large preserves connected by appropriately managed buffer areas.

Fragmentation of habitats is causing serious problems for the survival of many species. Effective preservation of Minnesota's biological diversity will require conservation at the landscape level in combination with the preservation of remaining small remnants of pristine habitat. Increasingly we must look at the opportunity to meet multiple objectives by planning across traditional natural resource program areas and politically imposed boundaries, as occurs when using the watershed landscape as the planning unit boundary.

The Minnesota Department of Natural Resources has already coordinated efforts to develop a statewide long-range plan for landscape conservation through the Prairie Landscape Reserve Act adopted by the legislature in 1987. This act requires the Department of Natural Resources to plan for the design and implementation of large prairie landscape reserves. This concept, as outlined in statute, envisions management of contiguous land areas of 2,000 acres or larger, comprised of an integrated network of public prairie lands, restoration sites, and private prairie lands. Prairies less than 1,000 acres are too small to sustain badgers, bison, prairie chickens, upland sandpipers, and other wide ranging species. If we are to protect the full diversity of the prairie ecosystem in Minnesota, we will need to establish a network of small and large preserves connected by appropriately managed buffer areas.

In 1985, the Minnesota legislature enacted the Comprehensive Local Water Planning Act in an effort to stimulate local action to identify and address water quality concerns and related land resource management. Approximately 60 of the 80 non metropolitan counties have embarked on this voluntary effort to identify the scope of local water problems and seek solutions to very serious environmental problems. Several groups of counties are exploring the possibility of implementing portions of their local water plans in concert with adjacent counties located within the same watershed. This is creating tremendous new opportunities for more holistic natural resource management and protection of precious water and related land resources.

Minnesota Environment and Natural Resources Trust Fund

As we close the century there is hope that by the year 2000, a stable source of funding will be in place to assist in meeting the tremendous needs for funding efforts to preserve Minnesota's natural heritage. In 1988, Minnesota voters overwhelmingly approved a constitutional amendment establishing the Minnesota Environment and Natural Resources Trust Fund, a fully protected endowment dedicated to long term "protection, conservation, preservation and enhancement of the state's air, water, land, fish, wildlife and other natural resources." For five years, fifty percent of the net revenues from the newly created Minnesota Lottery will be invested in the corpus of the trust fund, resulting in a projected \$250 million balance. Interest income from this fund will be used for purposes authorized in the constitutional amendment referenced above. Environmentalists will be lobbying to dedicate additional revenues to the trust fund to build the balance up to \$1 billion by the year 2000. This would result in a much needed \$75 million per year increase in funds available for natural resource programs in Minnesota.

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