

LEGISLATIVE REFERENCE LIBRARY
QL84.22.M6 M56 1975
Minnesota. Dept. of Natural Resources. The uncommon ones : animals and plants which merit special consideration and management.
3 0307 00043 1356

*Animals And Plants Which Merit
Special Consideration And Management*

...the Uncommon Ones



QL
84.22
.M6
M56
1975

LEGISLATIVE REFERENCE LIBRARY
STATE OF MINNESOTA

Minnesota Department of Natural Resources



James Brandenburg

**Krider's Phase
Red-tailed Hawk**

“Like winds and sunsets, wild things were taken for granted until progress began to do away with them. Now we face the question whether a still higher ‘standard of living’ is worth its cost in things natural, wild and free.” Aldo Leopold



Round-leaved Sundew

John Mathisen

Preface



Yellow Trout-lily

Ron Morreim

Conservation, as an official activity of State Government, is more than a century old in Minnesota. It began in the 1870s with a tiny hatchery for raising trout and salmon, and since then, has come to include both management and preservation of our many and varied natural resources.

As times change, new conservation needs and problems arise. To meet these new challenges, programs of the Department of Natural Resources must take new directions. Recently, there has been increased concern for the less common animals and plants. But in the past, little attention and consideration was given such species, other than general legal protection for some kinds, such as non-game birds and some wildflowers.

It is time to take a closer look at the status and prospects of these somewhat neglected biological citizens of Minnesota. We could lose some of them, and with them part of our living natural heritage. This must not happen, for these species, animal and plant, have many values — biological, ecological, genetic, educational and esthetic.

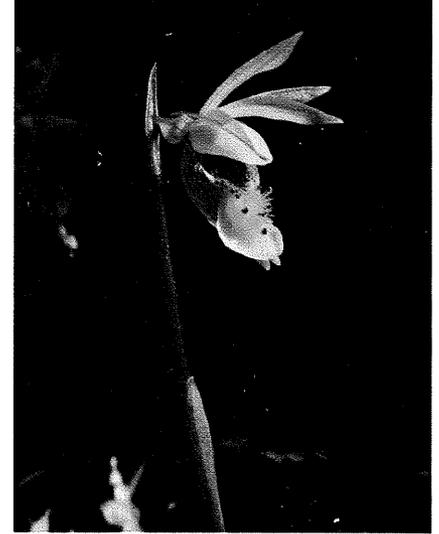
We must not ignore these species because of increasing pressures for more intensive land and water use. Practical considerations concerning their preservation and management must be a part of any decision-making process that affects our land and water.



Chuck Wechsler

Small Round-Leaved Orchis

Minnesota's Flora and Fauna



Alberta Smith

Calypso Orchid

Minnesota is located at a biological crossroads of three great vegetation regions: the western plains and prairies, the northern coniferous forest, and the eastern hardwood forest.

Our North Star State, because of its unique location and climate, even features a touch of the Arctic in our cold northern muskegs, while some plants characteristic of the southern Appalachians are found in our southeastern counties. Then, there are countless lakes, streams and wetlands that provide a great variety of aquatic and marsh plants.

All of these habitat types, their developmental stages, environmental niches, and margins where habitat types merge (ecotones), are the homes of many different kinds of plants and animals.

Each type of habitat favors certain kinds of plants and animals, and in turn, the habitat is modified by them.

If we add up the kinds (species) of plants and animals that thrive without care in Minnesota, such wildlings total approximately as follows:

	Total number of species
Ferns and relatives	69
Pines and relatives	13
Flowering plants (all)	1,700
Flowering plants (native)	1,500
Mammals	77
Birds ("regular species")	292
Reptiles	26
Amphibians	18
Fish	144

The above list is of "resident" species, in the sense that they reproduce in Minnesota. However, many of the birds that nest here winter elsewhere, and in this sense are "migratory." The American Eel is an exceptional case since it spends most of its adult life in inland waters, but spawns in the sea.

Most, but not all, of the wild plants are natives. About 200 of our wild flowering plants originally came from other places, especially Eurasia, and are

accidental introductions or escaped cultivated plants. Many of these plants thrive in disturbed situations and soils. Some examples are the common dandelion, quack grass, catnip, curled pondweed, and ox-eye daisy.

A smaller proportion of wild animals are non-natives. Among the mammals are the house mouse and Norway rat; the alien birds include the English sparrow, starling, common pigeon, ring-necked pheasant, Hungarian partridge, and, quite recently, the cattle egret and monk parakeet; and introduced fish include the German carp, rainbow trout, and brown trout.

Of the birds, 292 species are considered by the Minnesota Ornithologists' Union to be of *regular* occurrence. However, in addition there are 23 species listed as *casual*, 44 as *accidental*, 12 as *hypothetical*, and one (the Passenger Pigeon) as *extinct* — a total of 372.

Abundance And Survival of Wildlife

Some species, such as the robin and dandelion, are common everywhere in Minnesota, and known to everyone. Many others are moderately common; some are rare, and some very rare. A few are even "hypothetical", in that their past or present occurrence in Minnesota is uncertain.

Abundance of any species is determined by many factors, but especially the amount of favorable habitat, and the ability of a species to adjust to altered situations and conditions created by man.

Some kinds of plants and animals have been rare for a long time, because they need special kinds of habitats that are uncommon in Minnesota. In suitable habitats they may be locally common, and only if a needed habitat is endangered or threatened do such species become endangered or threatened.

In some cases an animal or plant that is endangered or threatened in any particular geographical area (such as Minnesota) may tolerate a wider range of conditions and be more common in other

By John B. Moyle

places. Many of our rarer kinds are at or near the edge of their natural ranges in Minnesota, and grow here only where local habitats especially favor them. Examples of such peripheral species are the Pine Marten in the well-developed coniferous forest along the Canadian border, and the Mamillaria Cactus on rock outcrops in the Southwest.

Greatest concern is needed for those which have characteristics and values that make them of special value or interest.

Concern must be tempered by practical considerations as to what can be done for the species considered. The list of animals and plants in need of special consideration reflects this approach. It is fully recognized that many other species are rare, peripheral or accidental, but often it is not practical to develop programs designed primarily to benefit them. Rather, the goal should be to preserve and manage habitat for the more common species with the expectation that the less common kinds found with them will also be helped. This concept of wildlife management is now being carried out in state parks, wildlife management areas, and state forests.

Classification

During the past ten years, various terms for categorizing species based on rarity and possibilities for future survival have been devised and used by federal and state agencies and private organizations. None is entirely satisfactory. There are semantic difficulties — the words having different shades of meaning for different people. Also, the species grouped under any one heading or placed in a single category vary considerably in abundance and prospects for survival.

Another difficulty is that categorizing of species is based largely on qualitative data and personal opinions which cannot be entirely objective. In attempting such categorizations, some of the terms which have been used are: "rare", "rare and endangered", "endangered", "threatened", "unique", "changing status", "non-game and endangered", "uncertain status", "local", "peripheral", "extirpated", and "extinct". To these, we have added "species of special interest", and have grouped the 64 species considered under a general heading: "Animals and Plants in Need of Special Consideration." Under this

heading are six categories which are defined on pages 6 and 7.

Other species were suggested by the more than 50 individuals and groups who twice reviewed preliminary drafts. Many of these species are listed on pages 28-30. None appear to be "endangered" or "threatened", but they deserve consideration in future management plans. Most are rare or uncommon in Minnesota, or apparently so. Many are peripheral species that are more common elsewhere, and are near the edge of their natural distributional range in Minnesota. A few are hybrids, such as Sandberg's Birch, which occur only occasionally and sporadically where the parent species are present.

The abundance and distributional ranges of species listed, as well as other members of our fauna and flora, are continually changing. Such changes may be imperceptibly slow for relict species that have held on in isolated suitable habitats (in some cases), since the Ice Age. Or they may be very rapid as is the case for some introduced European plants that have spread throughout much of the state in a few years. Some roadside weeds and wildflowers are of this type.

Plants and animals have had a long history, but less than one percent of the species that ever existed survive today. The rest have been displaced by competition from more efficient kinds and by changes in climate. Species have disappeared in the past and will disappear in the future, but human activities hasten such change.

Each species listed in this publication was selected largely on the basis of three considerations. These can be expressed as questions:

(1) Is the species, or has it in the past, been native to Minnesota at least during the reproductive period?

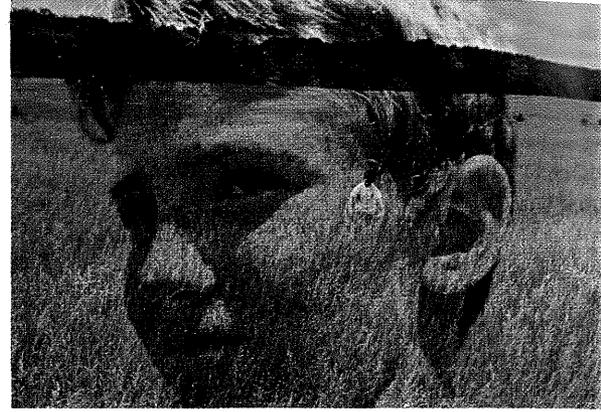
(2) How certain is the information concerning it?

(3) What can be done from the practical point of view to aid it?

Rarity or apparent rarity is considered, but this alone is not enough because a species may be rare because of a lack of habitat or unsuitable climate.

Because animal and plant populations change, as do habitats, and because our knowledge of many species is incomplete, the species listed in this booklet must be regarded as tentative and subject to future change.

Why Be Concerned?



Jim Ettema

Why should we be concerned about uncommon kinds of animals and plants which have little or no apparent practical value to us?

What difference does it make in our lives if a species should disappear from the Earth?

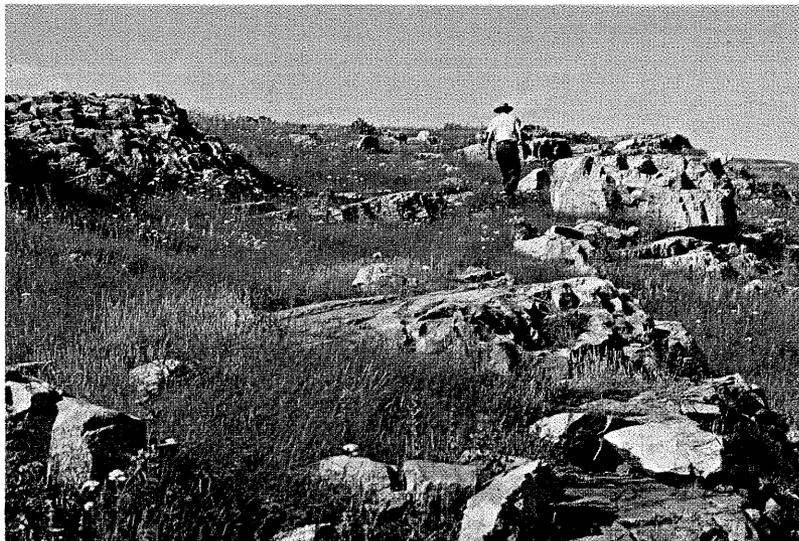
When answering these questions, we *must* remember that all living things are part of the natural order and system of things — call it the ecosystem — of which man is only one part. To better understand this concept, visualize a giant web with all plants and animals comprising the strands of the web. And to proceed one step further: If one strand were broken, or lost, would not the entire web be weakened?

Though studies have not provided concrete evidence one way or another, it is generally believed that when one species is lost from the environment, another species may be weakened or eliminated altogether. But no matter what the total long-term effect, something of value will be lost.

Here's another point to ponder. Each kind of wild animal and plant, in an evolutionary sense, is as successful as man, simply because it exists. Plants and animals are marvelously adapted to specific climates and habitats, and often they have properties and values that we may not be aware of, but may sometime need.

Each species contains its own unique inheritance or genetic pool, parts of which could be useful to us. Such qualities as disease resistance and the ability to make complicated chemical substances (as part of their life processes) are found in many plants.

Cultivated crops have been developed and improved — sometimes accidentally — by using wild plants as breeding stock. Wheat and corn are examples. Many of



Jim Ettema

Blue Mounds State Park

Environmental Education class at Savanna Portage State Park



Tex Hawkins

the complicated organic compounds manufactured by living things have been, and are being used, in medicine. Quinine and penicillin are examples. Others are the source of natural insecticides, such as rotenone and pyrethrum. Still others supply flavors, spices, and perfumes.

Then, there are the wildflowers, birds, mammals and other forms of life important for *non-consumptive uses* — bird watching, sight-seeing, painting, nature photography, etc.

Interestingly, two types of *consumptive uses* — namely hunting and fishing — have been wrongly blamed for the disappearance of certain wildlife species. But of the 104 species listed by the Federal Government as “endangered”, none has been threatened by regulated hunting seasons. The real culprits are changing land use and pollution which have destroyed the natural haunts of these species.

If sport hunting poses a threat to wildlife, our most popular game species including deer, grouse, pheasant, etc., would have become extinct long ago. Instead, their populations have stabilized and in many cases, prospered.

In fact, the efforts and contributions of sportsmen have helped to save many rare species. Hunters and fishermen pay for the support of all 50 state game and fish agencies through sale of licenses. The money for support of these agencies does NOT come from general revenue, as most people believe.

Refuges purchased by sportsmen’s dollars support more species of non-hunted wildlife than game species — by far. In Minnesota, the Department of Natural Resources has acquired 812 Wildlife Management Areas encompassing some 1.1 million acres. In most cases, these wildlife areas are open to the general public — the hiker or trail rider, the photographer, bird watcher, or school class.

Not only sportsmen, but *all* Minnesotans have a responsibility — call it an obligation — to help preserve the wonderfully diverse forms of life that have developed over eons of time. But this will *not* be accomplished by conquering the land. Instead, we must learn to live in harmony with it.



Walter Wettschreck

Orwell Wildlife Management Area

Animals and Plants In Need of Special Consideration

The following list of species, separated into six categories, includes 64 kinds of animals and plants that are considered by the Minnesota Department of Natural Resources to merit varying degrees of special consideration and management.

The type of consideration is indicated by the placement of the species in the list, and ranges from historical appreciation for extinct and extirpated species, through such habitat preservation, legal protection, and management as may be necessary for "endangered" species, for those with "changing or uncertain status" and for those of "special interest" in Minnesota. Details and management considerations are given in the notes which follow the species listing.

In the listing these explanatory symbols are used:

- E — Species classified under federal regulations as endangered for the United States as a whole.
- P — Afforded some degree of protection under Minnesota laws, the amount and kind of protection varying with the species.
- U — Specifically listed as "unprotected" under Minnesota laws.
- N — Status not specified under Minnesota laws — not legally designated either "protected" or "unprotected".
- R — Probably have always been rare or uncommon in Minnesota. Some of these are peripheral species.
- Ex — No longer in existence in Minnesota or elsewhere.

It should be noted that all migratory birds listed, including hawks and owls, are now protected under federal law.

Endangered Species — Species in danger of extinction in Minnesota within the immediate future. All are protected at present.

American Peregrine Falcon
(E,P,R) *Falco peregrinus*
Whooping Crane (E,P) *Grus americanus*
Minnesota Trout Lily (P,R) .. *Erythronium
propullans*

Threatened Species — Species which could become endangered in Minnesota in the foreseeable future, but not necessarily throughout their entire natural range.

Pine Marten (P) *Martes americana*
Bobwhite Quail (P) *Colinus virginianus*
Burrowing Owl (P) *Speotyto cunicularia
hypugea*
Greater Sandhill Crane (P) .. *Grus canadensis
tabida*
Greater Prairie Chicken (P) · *Tympanuchus cupida*
Blue-tailed Skink (N) *Eumeces fasciatus*
Massasauga (N,R) *Sistrurus catenatus*
Cricket Frog (R) *Acris crepitans*

Species of Changing or Uncertain Status —

Species that are uncommon or local in Minnesota, which are not presently endangered or threatened, but which could become threatened. Conversely, they could increase under favorable circumstances. Those starred (*) are probably increasing at present.

- Canada Lynx (U) *Lynx c. canadensis*
- Eastern Timber Wolf (E,P) .. *Canis lupus lycaon*
- Fisher (P,*) *Martes pennanti*
- Rock Vole (U) *Microtis ochrogaster*
- Common Tern (P) *Sterna h. hirundo*
- Double-crested Cormorant (U) *Phalacrocorax a. auritus*
- Franklin's Gull (P) *Larus pipixcan*
- White Pelican (P) *Pelecanus erythrorhincus*
- Cooper's Hawk (P) *Accipiter cooperi*
- Marsh Hawk (P,*) *Circus cyaneus hudsonius*
- Northern Bald Eagle (P,*) ... *Haliaeetus leucocephalus*
- Osprey (P) *Pandion haliaetus*
- Western Grebe (P,R) *Aechmophorus occidentalis*
- Blanding's Turtle (N) *Emys blandingii*
- False Map Turtle (N) *Graptemys p. pseudogeographica*
- Wood Turtle (N) *Clemmys insculpta*
- Black Redhorse (P,R) *Moxostoma duquesnei*
- Lake Sturgeon (P) *Acipenser fulvescens*
- Paddlefish (P,R) *Polyodon spathula*

Species of Special Interest —

Species that merit special consideration in Minnesota, and in some places and at some times, merit special management because of unusual or unique values, special public interest, or vulnerability of habitat. They are not presently endangered or threatened, nor apt to become so in the near future. They should be watched, however.

- Bobcat (U) *Lynx rufus*
- Common Egret (P,R) *Casmerodius albus egretta*
- Common Loon (P) *Gavia immer*
- Great Blue Heron (P) *Ardea h. herodias*
- Pileated Woodpecker (P) ... *Dryocopus pileatus*
- Six-lined Racer (N) *Cnemidophorus sexlineatus*
- Snapping Turtle (N,P) *Chelydra serpentina*

- Common Newt (N) *Notophthalmus viridescens*
- Redbacked Salamander (N) *Plethodon cinereus*
- American Brook Lamprey (N) *Lampetra lamottei*
- Blue Sucker (R) *Cyprinus elongatus*
- Least Darter (R ?) *Etheostoma microperca*
- Pugnosed Shiner (R ?) *Notropis anogenus*
- Eastern Hemlock (N,R) *Tsuga canadensis*
- Ginseng (N) *Panax quinquefolium*
- Showy Ladyslipper (P) *Cypripedium reginae*
- Ram's-head Ladyslipper (P,R) *Cypripedium arietinum*
- Little White Ladyslipper (P) *Cypripedium candidum*
- Turk's-cap Lily (P) *Lilium philadelphicum*
- Mamillaria Cactus (N,R) *Mamillaria vivipara*

Species that are extirpated or rare in Minnesota and have little future.

Species that once lived in Minnesota, but which were early extirpated, or nearly so. Because of habitat loss or alteration associated with increase in human population and changes in land and water use, there appears to be little possibility of re-establishing viable, sizable wild populations.

- Bison (N) *Bison b. bison*
- Eastern Cougar (U,R) *Felis concolor schorgeri*
- Elk (P) *Cervus c. canadensis*
- Grizzly Bear (U,R) *Ursus horribilis*
- Pronghorn Antelope (P,R) .. *Antilocapra a. americana*
- Wolverine (P,R) *Gulo luscus*
- Woodland Caribou (P) *Rangifer tarandus sylvestris*
- Swallow-tailed Kite (P,R) ... *Elanoides f. forficatus*
- Trumpeter Swan (P) *Olor buccinator*
- Blackfin Cisco (P) *Coregonus nigropinnis*
- Blue Catfish (P,R) *Ictalurus furcatus*
- Skipjack Herring (N) *Alosa chrysochloris*

Extinct Species — No longer in existence in Minnesota or elsewhere.

- Passenger Pigeon *Ectopistes migratorius*

Endangered Species



Jon Cates

American Peregrine Falcon

American Peregrine Falcon — This beautiful and fastest-flying of our hawks was never common in Minnesota. Possibly 20 pairs once nested on cliffs, especially along the lower Mississippi River and in the Northeast, notably along the North Shore. The Peregrine, of which there are several subspecies, occurs world-wide and has long been highly valued as a hunting hawk by falconers.

It is especially susceptible to injurious effects of DDE, a derivative of DDT, that it may obtain from birds and mammals on which it feeds. This pesticide causes thinning of egg shells resulting in breakage before they hatch. Probably no Peregrines now nest in Minnesota although a few are seen each year during the fall hawk migration along the North Shore. Peregrine Falcons are completely protected by both state and federal laws. Any nesting sites should be given special protection from molestation or any type of disturbance. Present restrictions on use of DDT in Minnesota should be continued to protect this bird and other raptors and fish-eating birds.

Minnesota Trout-lily — A small spring wildflower of the Lily Family, this is our only *endemic* plant species. It occurs nowhere else in the world other than at a few sites in southeastern Minnesota where it has always been rare and local. It is related to the larger trout lilies or “dog-tooth violets” which are common spring wildflowers on moist soils in the hardwood forests of the Southeast. One of the sites where it grows has been recently acquired by the Nature Conservancy. Other sites should be sought. Like all members of the lily family, it is a protected wildflower. It may need help in some areas to control competition from other plants.

Whooping Crane — The Whooping Crane was formerly a summer resident throughout the prairie region of Minnesota, but by 1900, it had become a rare migrant. The total population is now limited to a small flock which breeds in extensive, undisturbed marshy areas in northern Canada and winters in Texas. It has been the subject of much research and protection by the U.S. Fish and Wildlife Service and its Canadian counterpart.

Canadian investigators find that juvenile birds are more subject to mortality than adults and state that “so long as this mortality cannot be reduced, the whooping crane has little hope of reaching population levels at which it would be out of danger.”

At present, little can be done for this bird in Minnesota other than providing all possible protection to any occasional stragglers or migrants.



Ron Morreim

Minnesota Trout-lily



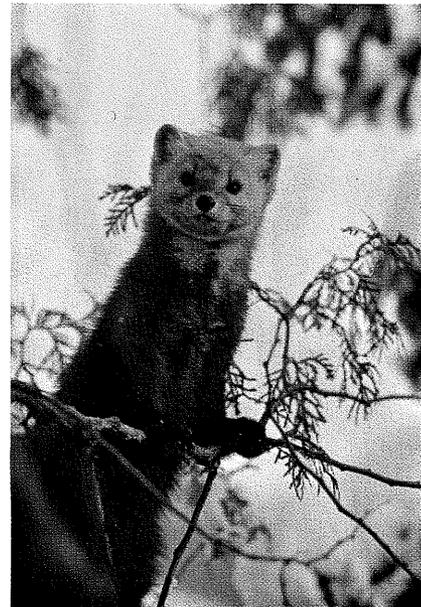
Stouffer Productions

Whooping Crane

Threatened Species

Pine Marten — This moderate-sized arboreal weasel was once common in the forested areas of Minnesota. Its fur was an important item in the early fur trade. In 1875, five fur-trading posts purchased 1600 pelts, but by the end of the century, it had become rare. Somewhat later the Pine Marten was probably extirpated in Minnesota. It is easily trapped.

Because of legal protection and the re-growth of northern coniferous forests, a few Marten, probably immigrants from Canada, have been seen along the Canadian Border in the Northeast in recent years. Protection should be continued.



Jim Brandenburg

Pine Marten

Bobwhite Quail — The Bobwhite is at the northwestern limit of its natural range in Minnesota and, although long known in southeastern Minnesota, was probably never abundant. Winters here are often too severe. Also, past plantings by the State, and releases by private persons of more southern strains of Bobwhite have probably reduced the hardiness of the birds.

The Bobwhite is no longer hunted as a game bird in Minnesota and is quite rare. Development of intensified farming with loss of brushy fence lines and untilled areas has also had an adverse effect.

More information is needed on the status of Bobwhite Quail in Minnesota and what might be done for the species. It is uncertain as to whether Bobwhite were native to Minnesota at the time of settlement, or whether it followed the farmer and land clearing.



Nebraska Game & Parks Commission

Bobwhite Quail

Burrowing Owl — This small ground-dwelling owl was once fairly common in the native prairie country of western Minnesota. Here it often nested in badger burrows. It has been protected for many years but has disappeared, or nearly so, from Minnesota largely because of loss of suitable prairie habitat.

Acquisition and management of native prairie remnants for prairie chicken and prairie ducks and possibly some local protection of badger should benefit this little owl.



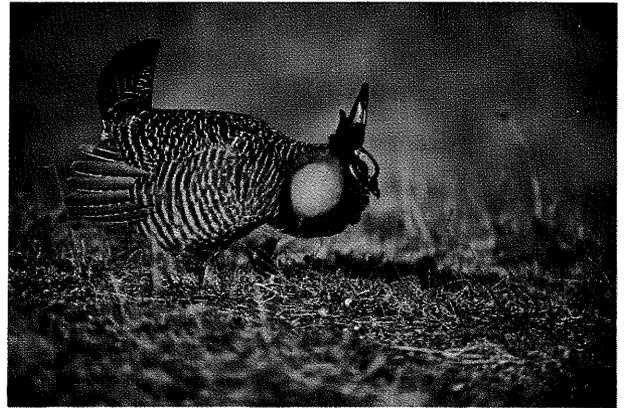
Jim Brandenburg

Burrowing Owls

Greater Prairie Chicken — The Prairie Chicken was probably native to Minnesota prairie country at time of settlement, though it was not abundant. There is, however, some difference of opinion on this. Breaking of the prairie sod and raising of wheat resulted in a great increase in its numbers, but even at the peak of its abundance, populations fluctuated greatly. In years of large populations, it was taken by hunting in phenomenal numbers.

Today, the Prairie Chicken is found mostly on prairie remnants in northwestern Minnesota. Some of these have been preserved as Wildlife Management Areas and others have been acquired by the Nature Conservancy. Hunting of Prairie Chickens has long been illegal.

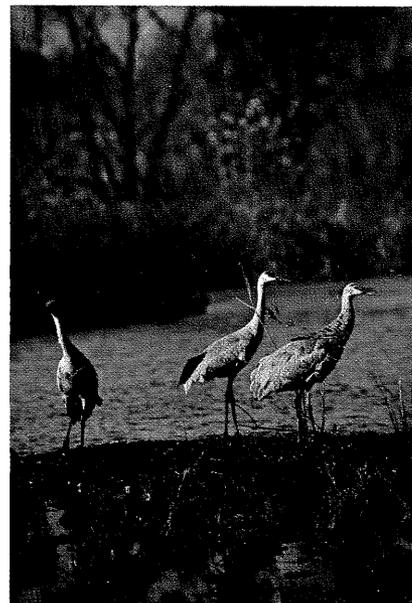
Considerable effort has been spent studying necessary habitat conditions for this species and its relative, the more abundant Sharp-tailed Grouse. Both need an interspersed of agricultural and wild lands. Rejuvenation of prairie habitat by occasional burning is beneficial to Prairie Chickens. Retention and management of lands for Prairie Chickens can be expected to also benefit other prairie animals and plants.



R. Town
U.S. Fish & Wildlife Service

Greater Prairie Chicken

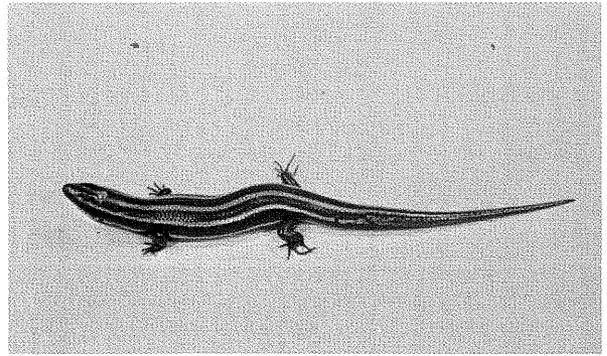
Greater Sandhill Crane — This large wading bird once commonly occupied prairie marshes, especially those of large size. During the period of settlement, many were shot by hunters, but the principal cause of its decline in Minnesota has been the drainage of marshes and wetlands as agriculture developed. It has long been a protected bird. It now nests in Minnesota only in a few large undisturbed marshes, often on large wildlife management areas. Here, and on similar areas, it should continue to receive special consideration and encouragement.



William Longley

Greater Sandhill Crane

Blue-tailed Skink — This lizard, which is quite similar to the much commoner Black-banded Skink (*E. septentrionalis*), is known in Minnesota only from granite outcrops in the upper Minnesota River valley. Here, it is at the edge of its natural range which extends over much of eastern United States. The granite outcrops are also of interest because of the unusual kinds of plants which grow on them. Some of these outcrops should be set aside as natural areas.

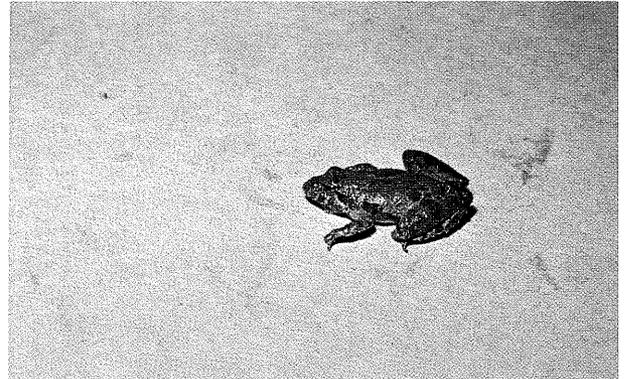


Walter J. Breckenridge

Blue-tailed Skink

Cricket Frog — This small frog, a member of the Tree Frog Family (*Hylidae*), reaches the northern limit of its range in southeastern and southwestern Minnesota. It is usually found in small meandering gravel-bottomed streams and on nearby moist grassy areas. Preservation of smaller streams and adjacent bottomland meadows in the trout-stream area of the Southeast should benefit the Cricket Frog.

The Leopard Frog (*Rana pipiens*) is our most abundant frog. In some years, more than 100,000 pounds (about one-half million frogs) have been taken during the commercial frogging season. Most frogs are sold to schools and hospitals for educational and biological uses, though many are used as fishing bait. Populations of the Leopard Frog fluctuate greatly and rapidly, often because of redleg, a disease caused by a bacterium. More needs to be known about causes of fluctuation of frog populations.



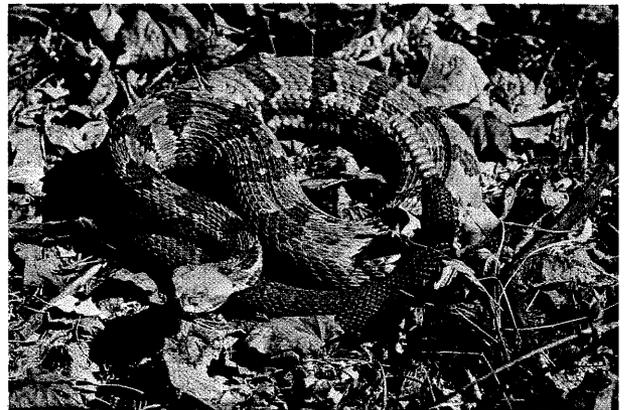
Dr. W. Schmid

Cricket Frog

Massasauga — This small swamp rattlesnake has a maximum length of about three feet. Its bite is poisonous. Although found in swamps and marshes across east-central United States, it is very rare in Minnesota and is known only from bottom lands along the Mississippi River in the southeastern counties. It does not live in rocky uplands as does the more common Timber Rattler (*Crotalus horridus*).

Preservation of river bottoms for other reasons should also preserve some Massasauga habitat. More should be learned about this snake in Minnesota.

It should be noted that snakes have no protection under State or Federal laws and that 14 of the 16 species of snakes which live in Minnesota are non-poisonous and generally beneficial. Several interesting and beneficial kinds, especially the Blue Racer, Pilot Black Snake, Fox Snake, Bull Snake, and Milk Snake, are uncommon. Little is known about their present status. All deserve a better public image. It is illegal to take snakes in State Parks and in Scientific and Natural Areas. Habitat preservation for other wildlife often favors snakes.



Wisconsin Natural Resources Dept.

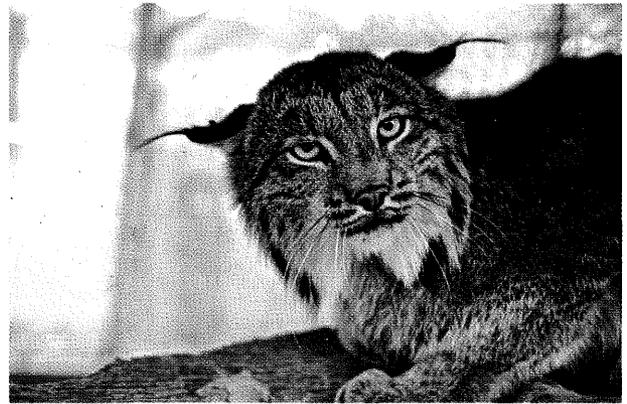
Massasauga

Species of Changing or Uncertain Status

Canada Lynx — This fairly large native cat is a wilderness animal that was not uncommon in northern Minnesota in pioneer days. Some (usually less than 100) are still taken each year by hunters and trappers. In 1971 the take was estimated at 11 animals. It is considerably less abundant than its relative, the bobcat.

Lynx numbers in recent years, as judged from reports of animals seen and taken, have fluctuated considerably, possibly because of changes in abundance of rabbits and rodents on which it feeds. The lynx has never had the status of a game animal in Minnesota. Such action is necessary so protection can be given when and where needed.

Maturing of northern forests favors the Canada Lynx. Possibly lynx reported in Minnesota in recent years have mostly been migrants from Canada. It is likely there is some competition for habitat between the Canada Lynx and the more abundant bobcat.



Walter Wettschreck

Canada Lynx

Fisher — This large member of the Weasel Family originally lived in forested country throughout Minnesota. It has been limited to northern Minnesota since 1880. After being rare for many years, it is now fairly common in the northeastern counties. From this area, 362 fisher were taken accidentally by trappers during the years 1964-71, and the pelts turned over to the Department of Natural Resources. During 1972-73-74, 295 pelts were similarly taken.

The Minnesota fisher population has been a source of animals stocked in Wisconsin and Michigan forests.

The fisher is omnivorous, but the bulk of its diet is small rodents and rabbits. It also takes porcupine and may sometimes take marten. It is completely protected in Minnesota. Because of an increase in its abundance, the fisher should have the status of game animal so excess numbers can be taken legally as the population warrants. Because of its arboreal habits, it has been favored by maturing of northern forests.



Jim Brandenburg

Fisher

Rock Vole — This rodent of subarctic and alpine areas is quite similar to the common meadow mouse. It is known in Minnesota only from near Burntside Lake in northern St. Louis County. The Northern Bog Lemming (*Synoptomys borealis*) is another far-northern mouse that is rare in Minnesota. The Pine Mouse (*Pitymys pinetorum*), which is widely distributed in eastern United States, has been reported in Minnesota only from the southeastern counties. Distribution and abundance of smaller mammals, such as native mice, shrews, and bats, is little known in Minnesota. The best approach to retaining them as part of our fauna seems to be preservation of a variety of natural habitats for other reasons, such as for the benefit of more visible and better known species of animals, and for management of forest trees and associated plants.

Eastern Timber Wolf — The Timber Wolf, at time of settlement, probably lived throughout the State, but as its name implies was primarily an animal of wooded wilderness. In recent years its main range has been the northeastern and north-central counties. The Timber Wolf is most common along the Canadian Border in Cook, Lake and St. Louis counties. It is estimated, on the basis of considerable field work, that the wolf population of Minnesota in 1974 was 800 to 1,100 animals.

The Timber Wolf is now protected in Minnesota, but the Minnesota Department of Natural Resources does not consider it an endangered or threatened species. However, it does merit special consideration and management.

Management favoring the Timber Wolf can now be provided, especially by designating refuge areas and limiting take when and where such measures are needed. The natural food of the wolf in northeastern Minnesota is mostly deer, augmented by smaller mammals. Forestry and game management practices favoring deer will, therefore, also favor the Timber Wolf. Moose are also killed by wolves in winter. In farming country the Timber Wolf will take and harass livestock, making control of damaging predatory wolves necessary.

Cooper's Hawk — The Cooper's Hawk inhabits wooded areas where it feeds mostly on wild birds. It will also take poultry and pigeons. This hawk is probably rarer than formerly although its abundance is difficult to determine because it is not easily seen in wooded and brushy country. Reportedly, its abundance has been adversely affected by organochlorine insecticides.

Two other hawks, the Red-shouldered Hawk and Swainson's Hawk, also merit special consideration. Both have probably always been fairly rare in Minnesota. The Red-shouldered Hawk seems to be expanding its range in central Minnesota. Swainson's Hawk, which once was found on the prairies, is now largely limited to the southeastern part of the State. More information is needed concerning these species. All hawks have long been protected by Minnesota laws, and are now also federally protected migratory birds.



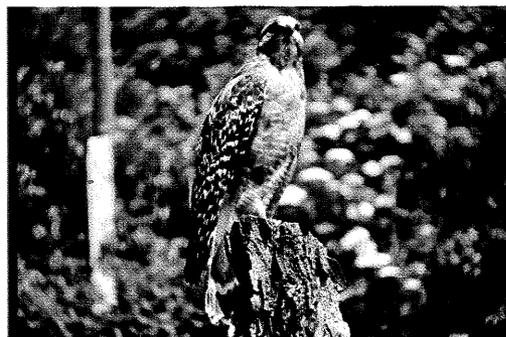
John R. Tester

Rock Vole



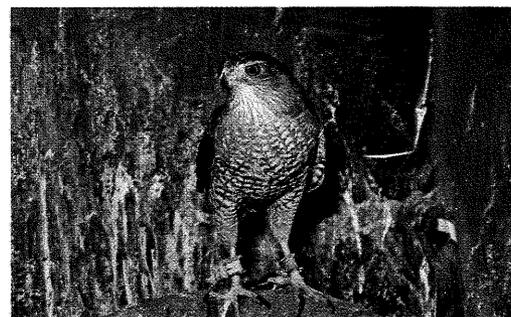
Lawrence C. Duke

Eastern Timber Wolf



Luther C. Goldman
U.S. Fish & Wildlife Service

Red-shouldered Hawk



Patrick Redig

Cooper's Hawk

Marsh Hawk — The Marsh Hawk was once a common summer resident breeding throughout the state, especially in open country. It usually nests in open or brushy meadows and drier portions of swamps. It is now less abundant than originally, but the population has probably been increasing in recent years. Loss of suitable marshy habitat, and possibly pesticides, may be involved. Nesting habitat should be preserved and restricted use of organochlorine pesticides continued.



Robert Drieslien

Marsh Hawk

Northern Bald Eagle — This magnificent raptor was once widespread in Minnesota along shores of lakes and rivers. Fish are its principal food but it also takes ducks and coots.

Minnesota has more Bald Eagles than any state except Alaska.

The greatest concentration is in the Chippewa National Forest, where eagles have been extensively studied and where they have been afforded special protection from human disturbance. Here the nesting population seems to be maintaining itself or even increasing somewhat. In this area there is an abundance of large trees — often red pine — suitable for nesting, and many lakes well supplied with fish. Here, ospreys are also present and often the eagles feed by robbing ospreys of fish they have caught.

In winter, Bald Eagles concentrate along the Mississippi River and Lake Pepin in southeastern Minnesota. Two important aspects of maintaining Bald Eagles in Minnesota are protection of nesting trees from human disturbance during the reproductive period, and continuing restrictions on use of DDT.



Nebraska Game & Parks Commission

Northern Bald Eagle

Osprey — The osprey or Fish Hawk, like the Bald Eagle, is mostly a bird of undisturbed wooded areas. The nest, a massive structure of sticks, is commonly built in dead trees, but at times a live tree or utility pole may be chosen. It may sometimes nest in heron colonies. The nest is usually not far from a lake or stream.

In Minnesota the osprey was once more common than at present. In the Chippewa National Forest, where it is associated with the Bald Eagle, a sizeable nesting population seems to be maintaining itself. Protection of nests from human disturbance and prevention of pesticide contamination of fish by controlling the use of certain insecticides — as is now being done — is essential.



Jon Cates

Osprey

Western Grebe — The Western Grebe has probably always been uncommon in Minnesota and limited mostly to shallow lakes in the prairie country along the western border. Like the four other species of grebes found in Minnesota (Holboell's, Horned, Eared, and Pied-billed), this species exhibits a curious courting behavior and constructs floating or loosely attached nests of aquatic vegetation. Such nests are quite vulnerable to human disturbance. Grebes are protected, but additional protection of individual nesting areas, when and where this is needed, may be desirable.



Bell Museum of Natural History

Western Grebes



Walter J. Breckenridge

White Pelicans



Walter J. Breckenridge

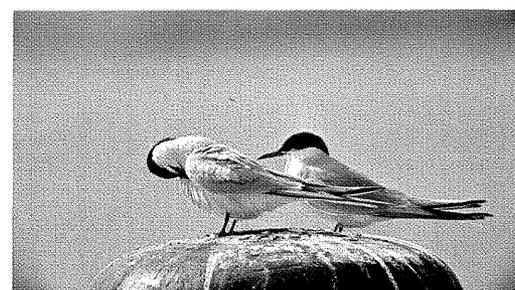
Double-crested Cormorant

White Pelican, Double-crested Cormorant, Franklin's Gull and Common Tern — These birds frequent aquatic habitats where they nest in colonies. Such nesting colonies are especially vulnerable to human disturbance and interference. The Double-crested Cormorant, which is a protected bird under Federal but not under State law, usually nests on islands as does the Common Tern. Both were formerly more common than at present. The White Pelican and Franklin Gull usually nest in colonies near shallow water or in marshes. Individual nesting colonies may merit special management consideration and protection, especially minimizing human interference.



Fred W. Lahrman

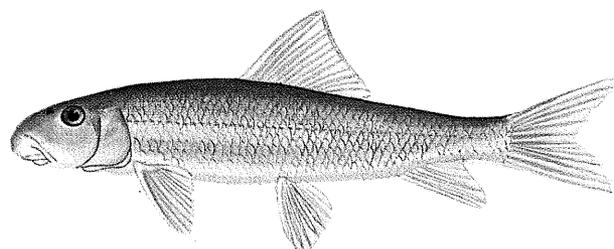
Franklin's Gull



Henry Roberts

Common Tern

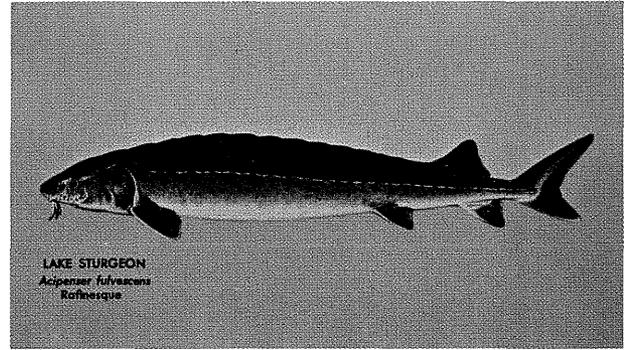
Black Redhorse — The Black Redhorse is one of several species of fish that are more common in southern and eastern United States than in Minnesota, and which reach the northern limit of their natural range in the Mississippi River and connected waters below the Twin Cities. Temporary northward migration, which probably once occurred, is now restricted by navigation dams. There is little that can be done for this species in Minnesota other than controlling pollution and maintaining good water quality.



Black Redhorse

Dave Laska

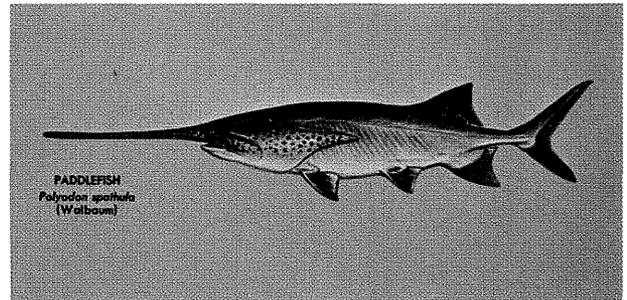
Lake Sturgeon — This is Minnesota's largest fish, reaching a weight of more than 100 pounds. It is slow-growing and long-lived. The Lake Sturgeon is especially vulnerable to nets. For this reason it was nearly extirpated from Lake of the Woods and from Minnesota waters of Lake Superior years ago. At present it occurs mostly in the St. Croix River and some of its tributaries, and the Mississippi River between Lake Pepin and St. Anthony Falls. It may be taken by hook-and-line only and the possession limit is one fish with a minimum length of 40 inches. The Lake Sturgeon population should be watched and artificial propagation considered.



Maynard Reece

Lake Sturgeon

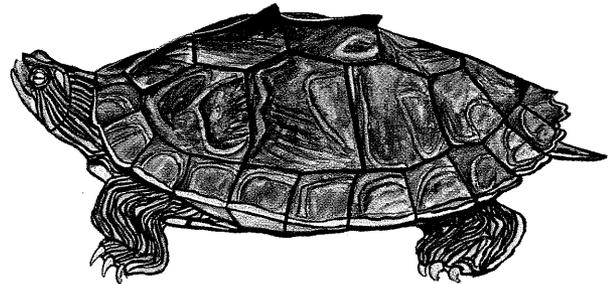
Paddlefish — This large plankton-feeding fish with paddle-like "bill" is of ancient lineage, a kind of "living fossil". It is of occasional occurrence in the pools of the Mississippi River below the Twin Cities. It has probably been favored by the construction of navigation dams which provide backwaters which produce a plankton crop. The Paddlefish may not be taken, and this protected status should be retained.



Maynard Reece

Paddlefish

Wood Turtle, False Map Turtle, Blanding's Turtle — These three less common kinds of turtles are limited in distribution mostly to southeastern and east-central Minnesota, where they are at or near the edge of their natural range. Collecting, or otherwise taking of them, should be allowed only under permit issued at the discretion of the DNR, and none allowed to be taken for sale. Preservation of natural, especially woodland, habitat in the vicinity of water will benefit these species.



Dave Laska

False Map Turtle



Bell Museum of Natural History
Wood Turtle



Bell Museum of Natural History
Blanding's Turtle

Species of Special Interest

Bobcat — This native cat is a forest animal quite similar to the Canada Lynx, but more common. Originally, the bobcat was more abundant in the hardwood forest country of southern Minnesota than in the North. However, cutting of northern forests and development of agriculture in the South has caused it to be more common in the North, with occasional animals in southern Minnesota.

The bobcat is unprotected under Minnesota laws. The annual take reported by Minnesota trappers in recent years has usually been several times that for Canada Lynx, but has dropped drastically during the past 20 years. Reported take for 1973 was 198 animals. The population, which has never been studied, apparently fluctuates with the food supply—mostly rabbits and mice. The bobcat should be given the status of a game animal, so its harvest can be regulated, and protection provided when necessary.



Nebraska Game & Parks Commission

Bobcat

Great Blue Heron — This heron is commonly seen along lake shores and streams where it feeds on fish. It usually nests in large colonies (rookeries or heronries), often in trees of coniferous swamps, but sometimes in hardwoods or large pines. Sometimes related kinds of birds, such as the Black-crowned Night Heron and the Common Egret, may use the same rookeries. All herons are protected birds. The most effective help that can be given them is to protect rookeries where the nesting birds and their young are concentrated.



F. C. Kniffin

U.S. Fish & Wildlife Service

Great Blue Heron

Common Egret — This white wading bird, which is quite similar but somewhat smaller than the Great Blue Heron, has become increasingly abundant in Minnesota in recent years. More information is needed concerning its nesting in Minnesota. It is fairly common along the Mississippi River in the Winona area. It is protected, and nesting sites should be given special consideration.

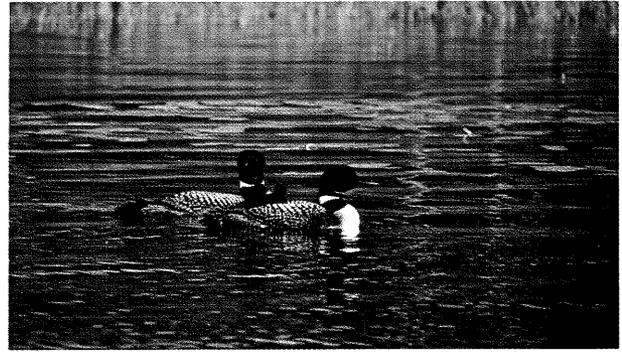


U.S. Fish & Wildlife Service

Common Egret

Common Loon — The Common Loon is the official Minnesota State Bird. It is a symbol — vocal and visual — of wilderness waters. A relatively common summer resident of northern Minnesota, it is seen elsewhere during migration. Occasionally it nests in southern Minnesota. It feeds mostly on fish.

The loon is intolerant of heavy human use of waters, shoreline development, or other human disturbance. Probably the best approach to aiding this bird is to maintain little-disturbed water areas, and continue restrictions on use of persistent insecticides, especially DDT.



Paul Sundberg

Common Loon

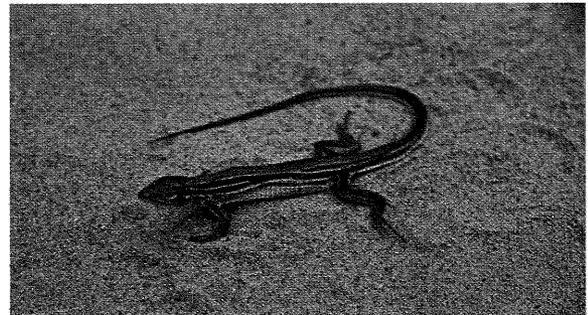
Pileated Woodpecker — This largest and most spectacular of our woodpeckers is not uncommon in areas of mature woods throughout the state. It and other woodpeckers need old and dead trees for nest cavities. The most effective management measure is to leave occasional suitable nesting trees in areas of forest cutting, and to preserve areas of mature forest in parks and elsewhere where this is feasible.



Fred W. Lahrman

Pileated Woodpecker

Six-lined Racer — This striped slender-tailed lizard, which is about nine inches long as an adult, has been found only along the lower Mississippi and St. Croix rivers in southeastern and eastern Minnesota. Here, it is at the edge of its natural range which extends through east-central and south-central United States. It inhabits dry exposed situations, such as rocky hillsides, where it feeds mostly on insects. Preservation of suitable habitat in southeastern Minnesota, in conjunction with the Memorial Hardwood Forest, should benefit this species.

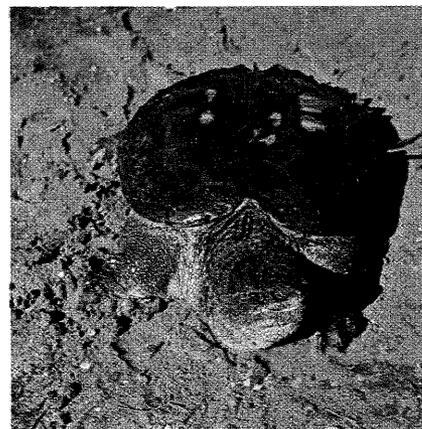


Walter J. Breckenridge

Six-lined Racer

Snapping Turtle — This is the largest of our turtles and is widely distributed in Minnesota. It is quite well known because of its habit of leaving the water in early summer to lay and bury its eggs in dry, warm soil — often sand. It has long been taken for turtle soup both by private citizens and by commercial turtle catchers. Although it feeds mostly on fish and carrion, it also captures ducks, especially ducklings, so control may be desirable in some places.

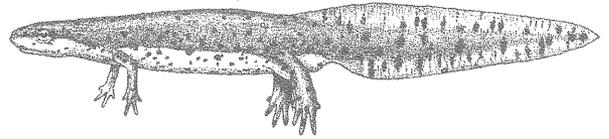
The Snapping Turtle reaches weights of more than 50 pounds but is slow growing. Reports from DNR field personnel indicate that Snapping Turtles are less abundant than formerly. At present it is protected under Minnesota laws which have established daily limits and minimum sizes which can be taken by licensed sport and commercial anglers.



Walter Wettschreck

Snapping Turtle

Common Newt — Natural range of this salamander includes all of the eastern United States and the southern part of eastern Canada. Minnesota is at the northwestern edge of this range. The adult, known as the "red eft", is about four inches. It inhabits undisturbed forest where there is heavy leaf mold and fallen logs. Mating and spawning occur in woodland ponds and the young are much like small frog tadpoles. Preservation of the Common Newt is mostly a matter of retaining forest habitat with suitable ponds.

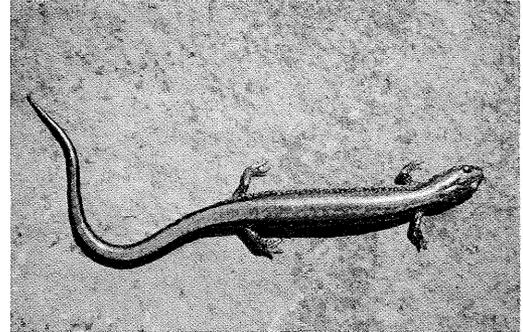


Walter J. Breckenridge

Common Newt

Red-backed Salamander — This species of tailed amphibian has been found in northeastern and east-central Minnesota, where it frequents mature forests with thick leaf mold and rotting logs on the ground — especially in maple-basswood forests.

This salamander is entirely terrestrial and does not resort to water for breeding as do our other species. Usual length of adults is between 3 and 4 inches. The name "red-backed" refers to the yellowish brown to bright reddish brown stripe on the back. Preservation of samples of moist, mature hardwood forest will favor this species. Fallen logs should not be removed and collection allowed only under permit.



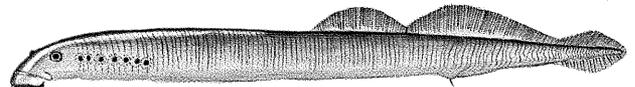
Bell Museum of Natural History

Red-backed Salamander

American Brook Lamprey — This small odd non-parasitic lamprey spends most of its life in the bottom mud of small clear streams in a larval or "ammocoete" stage. Here it feeds on aquatic invertebrates. It seldom attains a length greater than eight inches.

Brook Lampreys are usually seen only when they spawn in May on gravel riffles. After spawning the adults die. The Brook Lamprey does not attach to fish as does the Sea Lamprey and our native parasitic lampreys.

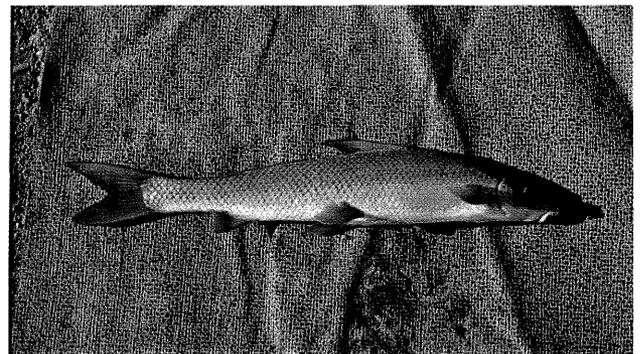
The Brook Lamprey is of considerable interest since it is a representative of a very primitive group of fishes. Preserving small suitable streams, and protecting these from pollution and siltation, will benefit the lamprey.



Dave Laska

American Brook Lamprey

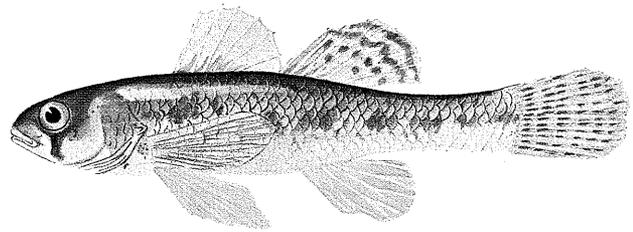
Blue or Missouri Sucker — This odd-looking dusky or bluish-black fish mostly inhabits more southern waters. In Minnesota it has been taken occasionally in the lower St. Croix River and in the Mississippi below St. Paul. It has a flat head, and the anterior edge of the dorsal fin is elongate as is the dorsal fin of carpsuckers. It is a good food fish. Maintaining good water quality in these rivers should insure its existence.



U.S. Fish & Wildlife Service

Blue Sucker

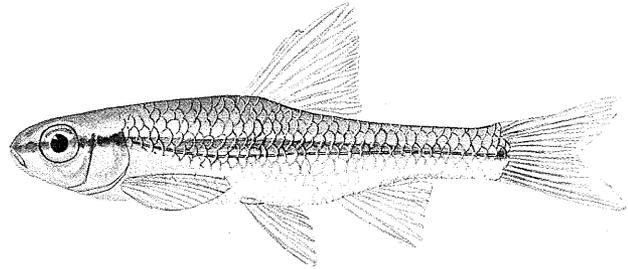
Least Darter — At maturity, this tiny member of the Perch Family (*Percidae*) is only 1 to 1.5 inches long. It is the smallest of our native fishes. It occurs in clear streams and sometimes in weedy portions of lakes throughout much of the state, but is less common than many of the minnows and other darters. Preservation of smaller streams in natural condition should benefit it. The distribution and abundance of several other species of darters in Minnesota is little understood, and some of these may also be rare or local. All require clean waters.



Dave Laska

Least Darter

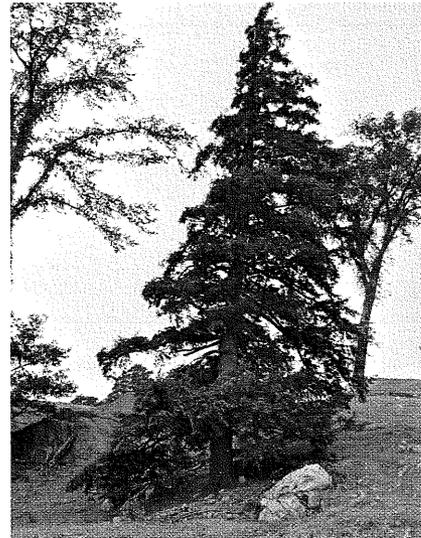
Pugnosed Shiner — This uncommon small minnow has a maximum length of usually less than two inches. It can be recognized by its nearly vertical mouth and dusky chin. It prefers smaller clear streams, and it apparently is intolerant of turbid waters. The Pugnosed Shiner is widely distributed in Minnesota, but is rare and probably can be considered a relict from the Glacial Period. Like many other kinds of fishes, it is benefited by keeping streams free from pollution and excessive turbidity.



Dave Laska

Pugnosed Shiner

Eastern Hemlock — This common forest tree of more eastern states is represented in Minnesota by a few specimens in east-central counties. The location of these monarchs is known by the Division of Forestry, MDNR. These trees should be preserved both as a matter of botanical interest and source of seed for an especially hardy strain of this conifer.



Walter J. Breckenridge

Eastern Hemlock

Ginseng — This native "drug plant" was once common in mature hardwood forests. It has long been collected, and is largely extirpated by people who dig for its odd-shaped roots which are thought to have great medicinal value by the Chinese. Clearing of forests has also been a factor.

Ginseng is now sometimes grown as a specialized forest crop. Preservation of undisturbed areas of hardwood forest, and possibly some planting, should help retain it as a wild plant and, at the same time, benefit many spring woodland wildflowers. Ginseng should be placed on the protected wildflower list so that collection of the roots from public lands can be regulated.



Ron Morreim

Ginseng

Lady's-slippers — The Showy Pink-and-White Lady's-slipper has long had the honor of being Minnesota's Official State Flower. The ladyslippers and other wild orchids are among several kinds of wildflowers protected under Minnesota law (Sec. 17.23). This law prohibits the buying or selling of ladyslippers and the picking or otherwise taking of such plants from public lands and from private lands without written permission of the property owner or manager. A permit is also required for such activities from the Minnesota Department of Agriculture.

The Showy Lady's-slipper is not uncommon in moist forests and semi-marshy areas of northern Minnesota, especially on rich organic soils where shade is moderate — not heavy. Often it grows in fairly dense stands in favorable areas. The Ram's-head Lady's-slipper is rarer than the Showy and prefers better-drained, often sandy soils in pine stands. The Little White Lady's-slipper is primarily a plant of alkaline marshes and swales in prairie country. It is quite rare.

More needs to be learned about the habitat preferences of these species and all of our native orchids. Known sizable stands of orchids should be preserved as natural areas in State Parks and on other public lands. Some management, such as burning and brushing, may be necessary on these special sites.

The smaller orchids, of which there are many species, seem to be in little danger since there are many areas suitable for them that are not apt to be disturbed. Some of these are on State Park and State Forest lands. Many are plants of muskegs and bogs. The present status of some of our rarer orchids, such as *Malaxis paludosa*, which has been found at only two places in Minnesota, is poorly known.

Mamillaria Cactus — This small cactus of the barrel-cactus type has red or purple flowers. It is found occasionally on rock outcrops, especially granite, in southwestern Minnesota. It grows with other rock and dry prairie plants. Preservation and protection of such rocky outcrops is desirable.

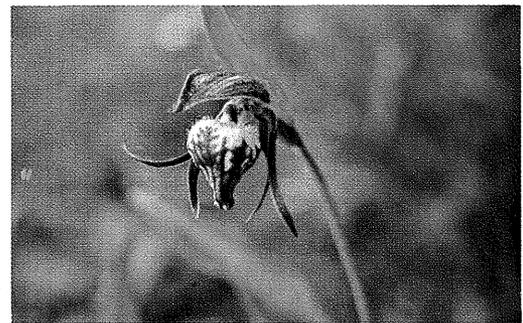
Turk's-cap Lily — This lily, also called Michigan Lily, is one of our most beautiful wildflowers. It prefers moist fertile soils such as damp meadows, prairie swales, and damp depressions along roads. In such sites, it is especially apt to be destroyed by alteration of habitat and intensive agriculture. It is also susceptible to spraying with herbicides. Habitat suitable for this lily and other moist meadow species should be preserved. Some such habitat can probably be found along trail systems established by DNR. The Turk's-cap Lily is a legally protected wildflower.



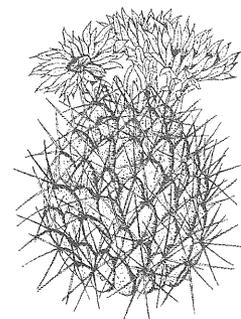
Walter J. Breckenridge
White Lady's-slipper



Chuck Wechsler
Showy Lady's-slipper



John Mathisen
Ram's-head Lady's-slipper



Dave Laska
Mamillaria Cactus



Chuck Wechsler
Turk's-cap Lily

Rare or Extirpated Species

Bison — When French explorers in the 1600s first reached the country that is now Minnesota, bison were common on the prairies and in the prairie-edge country. They were found as far east as the Mississippi River and Lake Pepin. By the 1830s, Bison had about disappeared from eastern Minnesota and no longer occurred regularly elsewhere in the state.

The last wild bison seen in Minnesota was a straggler in Norman County in 1880. At present a small number are kept in State Parks, zoos, and on wildlife farms. In Minnesota, the extensive tall-grass prairies, which were once bison range, are now farmland.



Jim Brandenburg

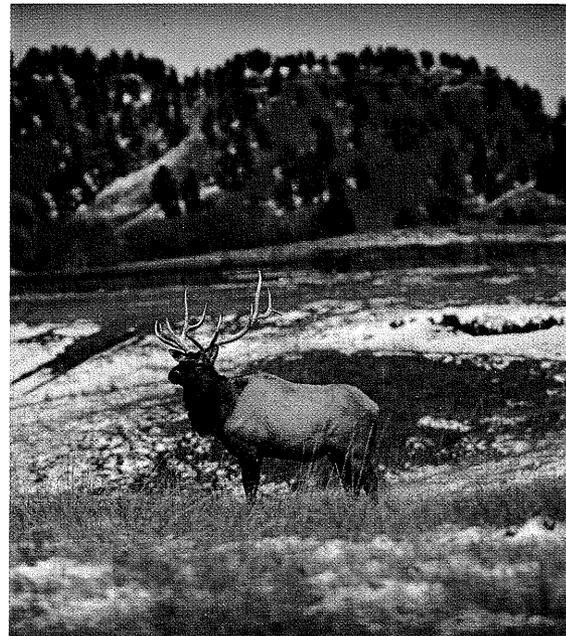
Bison

Elk — The elk or wapiti was once found throughout Minnesota, except in the Northeast. It was most common on the prairies and in the hardwood-prairie transition zone. By 1850 the elk were mostly restricted to western counties and by 1900 were probably extirpated in Minnesota except for a few stragglers from Manitoba.

In 1913, the Minnesota Legislature appropriated \$5,000 for establishing a herd in Itasca State Park. As a result 56 animals were obtained, mostly from Yellowstone Park in 1915. These were placed in a fenced enclosure between the two arms of Lake Itasca. James J. Hill, the railroad magnate, donated 14 of the animals.

In 1935, 27 of the captive elk were released near the northwest corner of Beltrami County. There were also other small releases. An aerial census in 1946 showed 68 animals in that region. There are probably about a dozen surviving in northwestern Minnesota at present.

In farming country, elk damage crops and haystacks. This has resulted in complaints and has encouraged poaching. Overall, the elk seem to have little future as a wild animal in Minnesota. The natural habitat of this large herbivore, like that of the bison, has been largely lost.



Nebraska Game & Parks Commission

Elk

Pronghorn — The Pronghorn or “antelope” was never common in Minnesota. It is likely that even as early settlement began, there were only occasional small bands on our western prairies. These were soon extirpated. In recent years a few stragglers from plantings of animals in eastern South Dakota have been seen in southwestern Minnesota.

The Pronghorn is protected under Minnesota law. The chances are poor for re-establishment of this ruminant in appreciable numbers as a wild, free-ranging animal.



Jon Cates

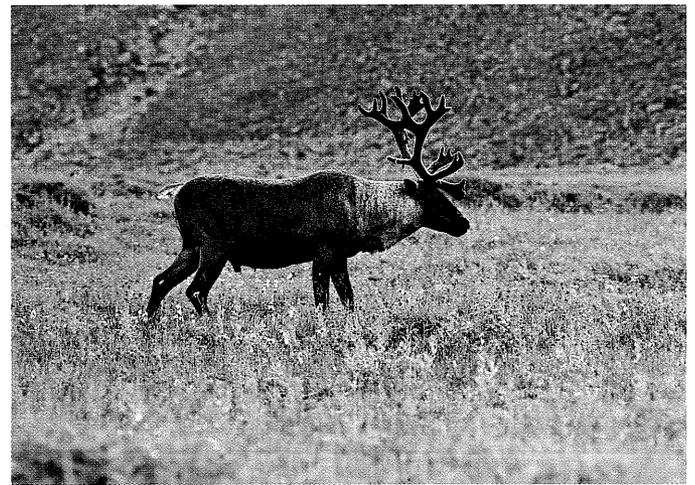
Pronghorn Antelope

Woodland Caribou — Woodland Caribou were once relatively common in the mature boreal forest of northern Minnesota. The original range extended as far south as Aitkin County. Caribou have been rare since the 1920s and disappeared in the early 1940s.

The last native band in Minnesota inhabited the extensive muskeg area north of Red Lake. In 1938 an attempt to augment this band was made by importing 10 animals from Saskatchewan. They were transported by train and truck to a corral near Washkish.

Ultimately (by 1942), 15 to 20 of the imported caribou and their offspring were released or had escaped. However, none was found by 1946, despite extensive aerial search. What happened to them? No one knows for sure. Some may have been poached. Others may have succumbed to disease.

It is known from recent work in Canada that both the European reindeer and its close relative, the Woodland Caribou, can be seriously infected by a worm parasite (*Parelaphostrongylis*) that causes “moose disease”. This parasite is carried by deer though they are not noticeably harmed by it. It is, therefore, unlikely the caribou can be re-established in the present deer range.



Les Blacklock

Woodland Caribou

Eastern Cougar — The cougar was never common in Minnesota, but prior to settlement, probably roamed over most of the state except in the Northeast. The last cougar to have been taken in Minnesota was killed in Becker County in 1897. There have been several reports based on sightings and tracks during the past 20 years. The cougar has no status under Minnesota laws — it is neither protected nor unprotected. Status of a game animal is suggested so protection and management can be given when, where and if needed.



Les Blacklock

Eastern Cougar

Grizzly Bear — The Grizzly Bear once inhabited the Great Plains where it followed the herds of bison. It once occurred occasionally in the upper Red River Valley, but the last record was in 1807. There is no chance for re-establishing the Grizzly Bear as a wild animal in Minnesota. Its original range is now farmland.



Les Blacklock

Grizzly Bear

Wolverine — This largest member of the Weasel Family was never common in Minnesota. Records of pelts taken by early fur trappers indicate that it originally ranged throughout the northern forests. In recent years it has again been reported occasionally along the Canadian Border. The wolverine is protected under Minnesota laws. Preservation of wilderness areas will favor it.



Allen G. Nelson

Wolverine

Swallow-tailed Kite — This black and white, hawk-like bird with a long forked tail formerly bred throughout the heavily timbered area of Minnesota at least as far north as Itasca Park and as far south as Hennepin County. By 1900, it was scarce and only one has been reported in recent years. It is still found in several southern states. Apparently it was favored by the "big woods" hardwood-forest type which is now mostly gone.



Bell Museum of Natural History

Swallow-tailed Kite

Trumpeter Swan — This largest of swans was formerly a summer resident of Minnesota and probably bred in many places throughout the prairie and sparsely wooded areas of the state. Swan Lake in Nicollet County is named for its former presence there. There are no nesting records for wild birds later than 1885.

Due to strenuous efforts of sportsmen, non-hunting conservationists, and conservation agencies, this bird has been rescued from extinction. The species is no longer considered endangered. Attempts have been made to establish new flocks by transplanting. In Minnesota a few Trumpeters are now being kept at the Carver County Natural History Area near Mound. Because of shortage of suitable habitat in its former nesting range, it seems unlikely that sizeable wild populations of this bird will be re-established in Minnesota.



Nebraska Game & Parks Commission

Trumpeter Swan

Blackfin Cisco — This coregonid fish is a variety of the Bluefin Cisco and is closely related to the Tullibee of many northern inland lakes and to the Lake Herring of Lake Superior. It was once common along parts of Minnesota's North Shore, where it was taken in the commercial fishery. It is now very rare or may even be extirpated. Three similar, but small and closely related fishes — commonly called "chubs" — are also rare and probably declining. They are *Coregonus reighardi*, *C. kiyi* and *C. zenithicus*.

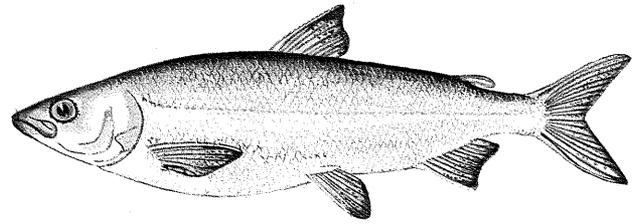
Overfishing in the commercial fishery and the adventive appearance of non-native competing fishes (smelt and alewife), along with the parasitic Sea Lamprey have been involved in the decline. Populations of these coregonid fishes fluctuate in Lake Superior and the best management approach is regulation of commercial fishing to favor preservation of spawning stocks and suitable spawning conditions. Even with this approach, it is doubtful that any particular species of coregonid can be singled out for special help.

Skipjack Herring — This member of the Herring Family attains a length of about 15 inches, but is usually smaller. It was once common in the Mississippi River as far upstream as Minneapolis, in the Lower St. Croix, and in the Minnesota River to its headwaters in Big Stone Lake. It has not been reported in recent years.

It is a migratory fish, and its former upstream movement has probably been prevented by navigation dams in the Mississippi River. It is now rare or extirpated above the dam at Keokuk, Iowa.

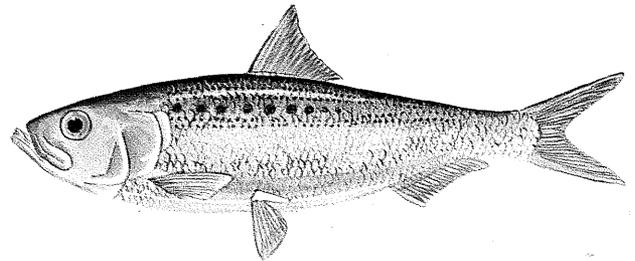
The Skipjack is of little value for food. However, it is of special biological interest. It is the specific host of the parasitic young (*glochidia*) of a clam, the shells of which were once important in the button industry. There is little possibility of restoring the Skipjack in Minnesota waters.

Blue Catfish — This largest of the American catfishes attains a weight of 150 pounds or more. It probably once occurred in the Mississippi River as far North as St. Anthony Falls at Minneapolis, and in the Minnesota River. None has been reported in recent years. The Blue Cat is thought to have been migratory from more southern waters, and its entry to Minnesota waters is now restricted by navigation dams. Apparently Blue Catfish were most common in pools below waterfalls.



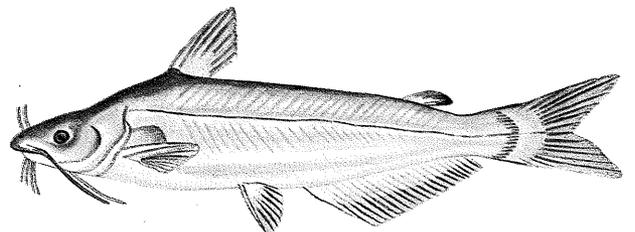
Dave Laska

Blackfin Cisco



Dave Laska

Skipjack Herring



Dave Laska

Blue Catfish

Extinct



Bell Museum of Natural History

Passenger Pigeons

Passenger Pigeon — The last reliable Minnesota record for the Passenger Pigeon is a nesting bird taken near Minneapolis in 1895. As is well known, the last survivor of this once spectacularly abundant bird died in the Cincinnati Zoological Gardens in 1914. The rapid decline of this species is well documented in Robert's "Birds of Minnesota".

The Passenger Pigeon was once taken in great numbers for food and sport. Netting and shooting took a deadly toll of the birds, but the settlement of lands west of the Alleghenies with the resultant destruction of forests in which the birds nested and roosted, sealed its fate. Other factors, such as disease, may also have been involved. The Passenger Pigeon is the only species of wild animal that formerly propagated itself in Minnesota and is now extinct.

Other Species of Concern

During the preparation of this booklet a considerable number of additional species were suggested by persons within and outside the Department of Natural Resources for inclusion in one or more of the six categories. These species, for various reasons, have not been included in the list or in the discussion section.

Some were found to be not as rare as originally thought; some are peripheral or occasional species in Minnesota; and a few are hybrids that can be expected to occur only rarely.

Some others were not included because of paucity or uncertainty of information concerning them. These suggested species are listed here for informational purposes and to call attention to the need for more knowledge as to their population status and needs and their habitat preferences.

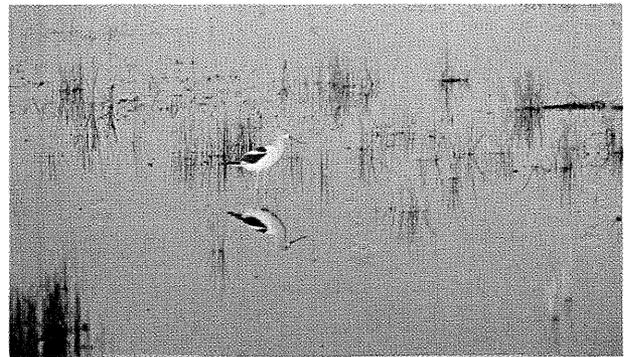
Of the 554 vertebrate animals which regularly occur in Minnesota, perhaps a fourth of them can be considered uncommon or rare. Of these, 56 have been previously listed as meriting special consideration, but only two are categorized as "endangered" and eight as "threatened". Some others are mentioned in the "notes". Other species that have been suggested include:

Mammals — Pigmy Shrew, Woodland Jumping Mouse, Red Tree Mouse, Richardson's Ground



John Mathisen

Flying Squirrel



Bell Museum of Natural History

Avocet

Squirrel, Star-nosed Mole, Least Weasel, Short-tailed Weasel, Little (Southern) Flying Squirrel, Northern Pocket Gopher, and Pipestrel Bat.

Birds — Little Blue Heron, Canvasback Duck, Cattle Egret, Gyrfalcon, Yellow Rail, Black Rail, Marbled Godwit, Short-eared Owl, Great Gray Owl, Acadian Flycatcher, Bewick's Wren, Carolina Wren, Spragues Pipit, Loggerhead Shrike, Louisiana Water-Thrush, Blue Grosbeak, Baird's Sparrow, Willet, American Avocet, Black-billed Magpie, Wilson's Phalarope, Chestnut-collared Longspur, Cape May Warbler, Tennessee Warbler, Bay-breasted Warbler, Mockingbird, Bluebird, Orchard Oriole, Longbilled Curlew, Avocet, Eskimo Curlew, and Blue-gray Gnatcatcher.

Reptiles and Amphibia — Great Plains Toad and Manitoba Toad.

Fishes — Pallid Shiner, Topeka Shiner, Gravel Chub, Slender Madtom, Banded Darter, Crystal Darter, Warmouth, and Yellow Bass.

Invertebrates — Too little is known about Minnesota invertebrates to make definite statements as to population status and needs.

Some species of Unionid clams, of which about 30 species are known from Minnesota, are less abun-

dant than formerly when the commercial taking of clams for their shells was a minor industry. Several factors are involved.

For some species restriction of migration of fish by dams, such as navigation dams in the lower Mississippi River, is probably important. (Clams are carried by fish as parasitic larvae or glochidia early in life.)

Pollution, sedimentation and parasites and diseases may also be involved. The Higgins-eye Clam (*Lampsilis higginsii*) has been suggested as being "endangered" in Minnesota, but this clam has been taken recently from Lake St. Croix. It might also be noted that there is apparently some uncertainty as to the validity of *L. higginsii* as a species since it is not listed in the most recent work on North American freshwater clams by J. B. Burch.



Ron Morreim

Southeast Trout Stream

Plants — Of the more than 1,700 kinds of flowering plants included in Moore and Tryon's checklist of Minnesota plants, about 1,500 are natives, with the remainder being introduced or adventive from other parts of the world, especially Eurasia.

Dr. Thomas Morley of the University of Minnesota has prepared a list of species of Minnesota plants that are mostly represented by four or fewer collections in the University of Minnesota Herbarium. These total 256 species of vascular plants, including 16 ferns and their allies, one of the pine (gymnosperm) group, and 229 flowering plants. Thus, about one vascular plant species in six for the entire flora can be considered rare and possibly "endangered" on the basis of this list.

Of the vascular plants, seven species are included in the list as "meriting special consideration". This may well be too few, but the selection assumes that a variety of habitats is being and should be preserved for both animals and plants, though not necessarily acquired or managed for a particular plant species. With this approach, there seems to be little chance that most such plants, even though many of them may be rare, are endangered or threatened.

In addition to the Minnesota Trout-lily, which has been placed in the "endangered" category, Dr. Morley mentions the following three species as rare and possibly endangered in Minnesota.

1. Whitlow-grass (*Draba norvegica*) — This is a low-growing, white-flowered member of the mustard family. It is known in Minnesota only from Cook County, but it occurs in more northern regions, both in Canada and Europe.
2. Prairie Bush-clover (*Lespedeza leptostachya*) — This is a slender, upright-growing, silky legume with whitish flowers. It is known in Minnesota from Cottonwood, Crow Wing and Goodhue counties. Elsewhere, it grows, or once grew, on prairie areas of northern Illinois, southern Wisconsin and northern Iowa.
3. Bog Adder's-mouth Orchid (*Malaxis paludosa*) — This inconspicuous orchid with a slender spike of tiny yellowish-green flowers is known in Minnesota only from sphagnum bogs in Otter Tail and Clearwater Counties. Elsewhere it has been found in Ontario, Alaska, and Eurasia.

The Forest Biology Department of the University of Minnesota, St. Paul, suggests inclusion of several rarer woody plants. They are the Chestnut Oak (*Quercus muehlenbergii*), the Swamp White Oak (*Q. bicolor*), and the Kentucky Coffee Tree (*Gymnocladus dioica*). These are southern trees that are rare or local in southeastern Minnesota.

There are also two rare hybrid birches: Sandberg's Birch (*Betula sandbergii*) and *B. purpusii*, which occur occasionally where ranges of the Bog Birch and the White Birch and Yellow Birch, respectively, overlap.

The Lingenberry (*Vaccinium vitis-idaea* var. *minor*) which is a subarctic species, is also suggested. This plant is of quite limited occurrence in Minnesota, being found locally in northern bogs. Some other arctic plants occur along the Canadian border.

Some prairie plants are in need of special consideration, especially some of the prairie legumes which played an important role in the original un-



Walter Wettschreck

DNR Wildlife Management Area

disturbed prairie habitat. The prairies were more than grasses!

Also there are the larger and more conspicuous prairie composites — such as rosinweed (*Silphium spp.*) that have become quite rare. Some of these prairie plants may require re-establishment by planting in selected areas. This is being done at the University of Minnesota Landscape Arboretum.

Roadsides, railroad rights-of-way, wildlife management areas, and trailways are being acquired by the Department of Natural Resources. These areas provide valuable habitat for many kinds of native prairie plants. Here, such plants should receive greater care and consideration than in years past.

Preservation of rare plants along with fostering of these of exceptional value and interest — such as ladyslippers and other protected wildflowers — is mostly a matter of retaining, protecting and managing their natural habitat. An area can be selected for preservation of a particular species, but this is often impractical. Usually a more reasonable and workable approach is selection, preservation and management of habitats for groups or associations of plants having similar ecological requirements. Many such habitats are already in public ownership, i.e., parks, state forests, and wildlife areas, though they may not be identified as having special botanical values.



Roger Grosslein

Showy Lady's-slipper on Roadside



Chuck Wechsler

Carlos Avery Wildlife Management Area

It is likely that maintenance of suitable habitat for some species — especially those characteristic of vegetation in developmental or non-climax stages will require habitat management. Plant habitats are subject to natural change. Thus, preservation of plants that prefer a particular developmental stage will require appropriate management at intervals — such as setting back plant succession by burning or controlled grazing.

Adequate legal protection from picking and collecting is also necessary and, as has been suggested recently by Dr. Gerald Ownbey of the University of Minnesota Department of Botany, consideration should be given to revising and updating the Minnesota Wildflower Protection Law.

Minnesota Vegetation Types

Of the major Minnesota vegetation types, examples should be retained in public or specially dedicated private ownership, and managed to include protection and preservation of native wild plants. Habitats starred (*) are in greatest need of such special consideration.

Coniferous forest types (often with much aspen and birch):

Great Lakes upland spruce-fir forest in northeastern Minnesota and along the Canadian border.

Great Lakes pine forest in northern, north-central and eastern Minnesota.

Wooded or open bogs, muskegs, and swamps associated with the two preceding types. These include: (a) northern swamp hardwood typified by black ash; (b) floating sedge mats often with bog birch; (c) muskegs of ericaceous shrubs, often with black spruce; and (d) tamarack and white cedar swamps which occur in hardwood forest areas in southern Minnesota (*).

Igneous rock outcrops along the North Shore (*) and similar areas paralleling the North Shore and along the Canadian border lakes.



Ron Morreim

BWCA Swamp



**Red Pine —
Preacher's Grove at
Itasca State Park**

Chuck Wechsler



Jim Ettema

Floodplain Forest



Ron Morreim

— Rock Outcrop — Memorial Hardwood State Forest

Hardwood forest types:

Upland hard maple-basswood forest (often with oak) in southeastern Minnesota (Carolinian Life Zone), especially in valleys including sedimentary rock outcrops.

Upland hard maple-basswood forest (often with oak) in central and northern Minnesota (Alleghenian Life Zone).

Floodplain forest of cottonwood, willow, elm, walnut, and silver maple and non-wooded flood plains associated with above two types, especially *along the lower Mississippi, St. Croix, and Minnesota Rivers.*

***Oak savanna** of scattered oaks with prairie vegetation, often on sandy soils.

***Spring and seepage areas and spring-fed streams** associated with foregoing types (especially upland hard maple-basswood forests in southeastern Minnesota).

Marshes and wetlands associated with the above types.

Prairie vegetation types:

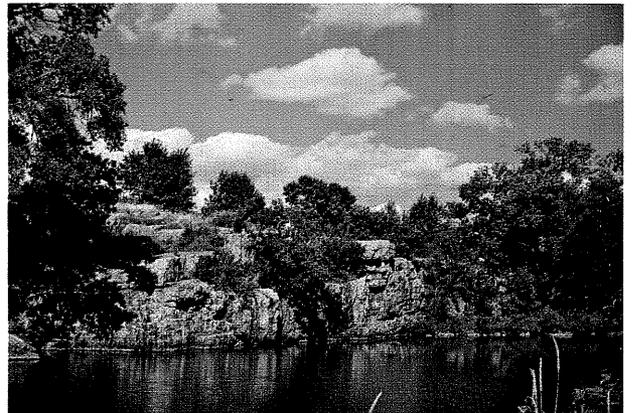
***Upland prairies** with undrained swales and wetlands *on deep fertile soils* in southern Minnesota.

***Upland prairies** with swales, wetlands, and pools *on lighter soils* and often *with igneous or metamorphic rock outcrops*, mostly southwestern Minnesota.

***Upland prairies** with swales and wetlands *on sandy soils* sometimes *with dunes and blow-outs*. Mostly on the central Minnesota sand plain and Lake Agassiz beach areas.

Upland prairies, swales, wetlands, springs and seepage areas often *in regions of alkaline and saline waters*, especially where there are clayey soils. Southwestern and extreme western Minnesota.

Prairie-like areas frequently with red cedar, often *on southfacing slopes* and especially along rivers in the southeast.



Division of Parks and Recreation

Blue Mounds State Park



Chuck Wechsler

— Sand Dunes — Bunker Prairie Park

The Minnesota Department of Natural Resources wishes to thank the many Minnesotans and various resource agencies who have given generously of their time to help prepare this booklet. It should be noted that this publication *does not* constitute a list of endangered and threatened species as described in either the State or Federal endangered species acts (M.S.A. 97.488 or Public Law 93-205, respectively). It is a discussion of the biological status (1975) of some of the Minnesota animals and plants in need of special management consideration. Certainly, selection of these species has been a difficult and sometimes controversial task, but it provides needed guidelines for the future.



Lawrence C. Duke

