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# Wisconsin NATURAL RESOURCES

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# The pintail

*MARY WALKER, DNR Editorial Intern*

Sometimes called "greyhounds of the air" because they are sleek and swift-flying, pintails have a classic look. They get their speed — about 50 miles per hour — from gull-like wings that move through an extended arc and beat rapidly. The males float high on the water and with their erect brown heads, long white necks and jaunty, up-swept tails, create scenes of poignant beauty.

Pintails vie with bluebills as the second most abundant duck in North American — after the mallard. Numbers since 1955 have varied from an average of about six to a high of 10 million.

There is only one race of pintails and it ranges farther over the earth's surface than any other waterfowl species. They breed across northern Siberia, the Scandinavian Peninsula and Iceland. In North America, they breed in the central Canadian Arctic, south to California, New Mexico, Colorado and east to the Great Lakes.

About 75 to 100,000 pintails migrate through Wisconsin each year, with the largest number passing through in late October and early November en route to Louisiana and the Some western birds go as far as Ceylon and the Philippines. The biggest migration is through California and some of these sweep eastward to move north through the Central and Mississippi flyways in spring.

Some pintails have a propensity to travel and pioneer new lands. One duck banded in Utah, turned up on Palmyra Island, more than 1,000 miles south of Honolulu. Another banded pintail from Iceland flew across the Atlantic Ocean and reached Quebec. Two others started in Labrador and flew to England.

One of the first ducks to leave Wisconsin in fall, pintails are also one of the first to migrate north in late March and early April. Winter is reluctantly retreating when the first nests appear.

Pintails nest on the ground where vegetation is sparse. They use farmland habitats more than any other waterfowl and may locate nests more than a mile from water, though most are within 100 yards. The average clutch is eight eggs which are incubated for 22 to 23 days. The hen raises the brood with no help from the drake.

**Docksiders. Watercolor by Artist Al Dornisch, courtesy of the Leigh Yawkey Woodson Art Museum, Wausau and Artist Portfolios, Inc., Minneapolis, MN.**

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## Features




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# Fourmile Island

These dead nest trees will soon fall down. The state's biggest great blue heron and great egret rookery at Fourmile Island in Horicon Marsh is threatened because new trees aren't growing to replace the dead ones. **Photo by author** Inset photo by Jerry Bartelt

*GREG MATTHEWS, DNR Public Information Officer, Madison*

**"We have no specific description of the marsh before the coming of the white man, but it must have been a paradise for waterfowl and shorebirds of many species.**

**"A whole book could be written on the history of Horicon Marsh, and it presents one of the most outstanding examples of near-sighted land planning that this nation has ever seen."**
**Earl T. Mitchell, Project Leader, Horicon Marsh Wildlife Area, June, 1943**

very now and then a new irony turns up in the age-old push-and-shove match between land and people. Horicon Marsh and its 32,000 acres of wildlife, fish and plants has so far survived mankind's varied attempts to dam, drain and dredge it. But now, ironically, a portion of the marsh, Fourmile Island, faces a new potential problem, not from misdirected developmental zeal, but from nature itself.

Fourmile Island, about 2,000 feet long and 800 feet wide, covers 15 acres and was designated a scientific area in 1965. Of glacial origin, it is surrounded by marsh, with the Rock River's East Branch flowing adjacent to the west.

One of the few Wisconsin scientific areas created primarily for birds, Fourmile Island harbors the largest great blue heron and great egret rookery in the state.

And its size is the crux of the dilemma. The birds are destroying the very habitat they need for survival.

The island's perimeter vegetation is dominated by white ash and tag alder. The remainder is basswood, American elm, smaller chokecherry, red oak and cottonwood.

Great blue herons and egrets nest in the upper tree branches and black-crowned night herons nest in the lower ones.

"Nest trees, especially large elm and basswood, are falling down and there is little regeneration for future nest sites,"

Access to the Fourmile Island Scientific Area isn't easy. Researchers pay regular visits to keep track of the egrets and great blue and black crowned night herons there.
Photo by author

according to Jerry Bartelt, project leader for DNR's wetland wildlife research group.

Aerial photograph comparisons and research conducted by student interns during 1980 show that the percent of dead or dying trees on Fourmile Island has increased over the last decade. Dutch elm disease and severe weather also contribute to the decline.

"Wind storms blow down valuable trees that harbor not only nests, but eggs and even young birds," says Bartelt.

Bartelt and wildlife manager Tom Nigus conducted a June, 1980 survey following a severe windstorm and counted 47 young herons and egrets dead on the ground. Another harsh storm in April, 1981 blew down 54 trees and major branches, many once supporting active heron nests.

But what may be more significant to habitat destruction than either disease or weather is the large amount of guano droppings — bird manure — that prevents regeneration of potential nest trees. Dense nettle and some chokecherry are the only apparent understory species.

"Significant accumulation of guano is known to alter soil acidity severely enough to deter regeneration," according to Bartelt.

"There's no evidence of young understory tree establishment to replace those that are dying," emphasizes Nigus.

In fact, Nigus says the same thing that's happening now also took place during the early '40's. Egrets migrated to Fourmile between 1944 and 1946, when lack of nest tree regeneration and human disturbance degraded their rookery at Lake Sinissippi.

"Someday, if nest trees continue to decline, we may need to erect artificial platforms," says Bartelt.

It's possible to use telephone poles with horizontal, basket-type nesting platforms similiar to those successfully employed for double-crested cormorants at Grand River Marsh and Green Bay.

Bartelt and Nigus are monitoring the rookery annually to determine its status and guiding management to maintain a stable population. Their efforts include summer nest and population surveys, plus winter nest counts.

The monitoring is particularly significant because no other large island on the marsh can support Fourmile's population.

Populations have varied a bit over the last 10 years with all three species producing slightly more than two young per nest, the number needed to maintain

Young great blue herons on the nest. Artificial platforms may have to be installed at Fourmile Island if tree losses continue.
Photo by Jerry Bartelt

## FOURMILE ISLAND ROOKERY NESTS: 1970-1981

| SPECIES | Minimum | Maximum |
|---|---|---|
| Great Blue Heron | 370 | 870 |
| Great Egret | 145 | 350 |
| Black-crowned Night Heron | 170 | 1,246 |

*Adult population is roughly double the nest number.

**Each species produced slightly more than two young per nest.**

the population.

The great blue heron and black-crowned night heron were once common to most of North America, while great egrets, though primarily southern, also range into Wisconsin.

The three species almost invariably nest with each other — great blues and egrets high in the largest available trees and black-crowns on the lower branches. Great blues and egrets favor nests toward the middle of Fourmile Island where there are taller trees, while black-crowns occupy the perimeter.

North American egret and great blue populations declined rapidly during the last century. Agricultural deforestation wiped out rookery habitat and drainage eliminated forage areas.

Bartelt and Nigus say they are determined to keep herons and egrets on the island.

"If we have to give aid with artificial nest structures, we'll do it. These unique birds are an integral part of the marsh system," says Bartelt.

"Egrets are a threatened species in Wisconsin," adds Nigus, "and great blues are on the decline throughout the Midwest."

Both men view the birds as one of the most important resources on the marsh, though not as well-known as Canada geese.

"Egrets and herons indicate the health of the ecosystem. They represent the top of the marsh's food chain and they belong here. We intend to maintain them as a viable resource," says Nigus.

*Fourmile Island Scientific Area is an inviolable wildlife refuge from April 1 through September 15. Entry is prohibited during these months to prevent human disturbance of nesting birds.*

*Visitors to Horicon Marsh can still observe the herons and egrets from DNR's Horicon Area office or along many scenic vantage points around the perimeter.*

*During the non-nesting period, visitors to Fourmile Island Scientific Area are urged to obtain detailed instructions for locating and using the area from DNR personnel at the state headquarters on Palmatory Street.*

# The Mississippi can can

Canvasbacks are nearly gone from Wisconsin's "Upper Lakes" and their habitat is threatened on the Mississippi. Photo by Harry J. Libby

*DAVE WEITZ, DNR, Public Information, Eau Claire*

**Most of the canvasback ducks in the world are on the Wisconsin border every fall. They need a lot of help to survive. They can if they get it.**

The old-timer sat back in his wooden rocker and looked across the living room. In his mind's eye he saw the canvasback ducks of yesterday swing into his decoys on Lake Puckaway.

World War I was still years away, and President Teddy Roosevelt worked with John Muir and Gifford Pinchot to create a system of national parks.

It was a good time to be a youngster and a duck hunter in Wisconsin. His tutors were market hunters who sold the tasty "can" to Eastern hotels. The ducks were shipped in refrigerated freight cars labelled "eggs" to avoid inspection and possible prosecution under the Federal Lacey Act.

A good shot, back then, could count canvasbacks by the dozens after a day's hunt when birds swept in to feed on Puckaway's wild celery. Back then, the "sports" came in from southeast Wisconsin by train to hunt Puckaway as well as Rush Lake, Poygan, Winneconne, Butte des Morts and Lake Winnebago.

The "Upper Lakes" of the Winnebago chain on the Fox River once seemed a perpetual haven for diving ducks. French explorers in the 18th century, canoeing a narrow channel through vegetation-choked Lake Butte des Morts, said waterfowl there "blackened the sky."

Quietly, though, the lakes changed.

The legendary flights diminished.

Bill Wheeler is DNR's Wetland Wildlife Research project leader at Horicon. In 1979 his aerial survey one fall day found only 550 canvasbacks on the "upper lakes."

On Lake Winnebago today they're "almost nonexistent," according to Gary Jolin, DNR Area Wildlife Manager at Oshkosh. On Lake Poygan the entire fall migration brings only about 2,000. Reasons for the change have never been solidly proven, but what's clear is that the number of diving ducks using the area is only about one-twentieth what it once was.

Arlyn Linde, Oshkosh, is a wetlands specialist with DNR's Bureau of Research. As a scientist, he is frustrated at times because information about the "Upper Lakes" is often more legend than fact. "The trouble is there are just no records; it's people's memories. Good biology depends on more than recollection."

But Linde points out that "wild celery was very widespread at the time canvasbacks were at their peak."

After the turn of the century, celery beds began to disappear. They were considered unwanted weeds by many who built cottages. And as attempts to get rid of vegetation succeeded, wave action and wind scoured out the more submergent growth. Water became turbid and, in turn, less able to support fragile plants. Boating and carp made it worse. And along with celery, the wild rice went too.

In one place, recent DNR changes have started to reverse the trend. Near the western end of Lake Poygan, 5-1/2 miles of wave barriers were placed off shore to ease scouring action.

Wild celery is coming back. Water is clearing up. Tom Howard, DNR Wildlife Manager at Wautoma, says arrowhead, another duck food, is returning to some of the sheltered bays. Wild rice is improving. Somewhere between 2,000 and 3,000 canvasbacks now use the area. More redheads and scaup are also showing up. Even fishermen appear to be more successful in the clearer water.

While canvasbacks have declined on the "Upper Lakes" they have increased dramatically on the Mississippi River at Lake Onalaska in Pool Seven and in large portions of Pools Eight and Nine.

The change seems to have taken place in the late '50s and early '60s. Diving ducks peaked at 78,000 on the Upper Lakes in 1955 and use of the Upper Mississippi Refuge by canvasbacks has increased steadily since then.

"It's not unreasonable to say that we probably have three-quarters of the world's canvasback population migrating through here in the fall," says Carl Korschgen, Wildlife Biologist with the US Fish and Wildlife Service at the Northern Prairie Wildlife Research Center in La Crosse.

The tremendous switch in canvasback populations to Lake Onalaska and the Mississippi was easy to recognize and studies were launched to find out why it happened.

Once the "Upper Lakes" — Winneconne, Poygan and Butte des Morts — had vegetation similar to Lake Onalaska. Changes had clearly taken place, as they also had at Lake Koshkonong, in southern Wisconsin — Lake Peoria, along the Illinois River — the Illi-

nois River Valley and even along the Mississippi near Keokuk, Iowa.

The Illinois River used to provide habitat for millions of canvasbacks. But Korschgen says that during the mid '60s the river lost its integrity and diving ducks deserted it.

Until the 1930's, the Illinois River Valley was an outstanding waterfowl area. The saga of its decline was outlined by Frank C. Bellrose, Fred L. Paveglio Jr. and Donald W. Steffeck, in a paper published by the Illinois Natural History Survey Bulletin. They said that if untouched, the river would have evolved slowly, with sediment filling some bottomland lakes as others were created.

But in 1900, the Chicago Sanitary and Ship Canal was built. It sent water from Lake Michigan and sewage effluent from Chicago down the Illinois. Thousands of acres of bottomlands were flooded and vegetation changed. Then levees were constructed and drainage districts formed. Pollution from urban populations increased.

"At first," biologists said, "only the extreme upper reaches (above Marseilles) were affected. However, the zone of pollution steadily moved downstream until, by 1922, the upper Illinois was essentially a dead river, devoid of important aquatic life as far south as Chillicothe."

Beds of coontail and wild celery in Peoria Lake, a canvasback spot of note, disappeared by 1920. By the 1960's most aquatic vegetation in the Illinois Valley was gone.

"We conclude," said the report, "that increased turbidity and sedimentation were responsible for the disappearance of most aquatic plants from lakes in the Illinois Valley during the 1960's."

At the same time, soil erosion, coupled with high water velocity in tributaries and sluggish river flow helped fill backwater lakes with sediment at a rapid pace.

As aquatic plants declined, numbers of pintail, widgeon, green-winged teal and blue-winged teal dropped. These are "dabbling" ducks which find food in shallow areas.

But canvasback are "divers" that use deep water. They didn't show the decline immediately like the Illinois Valley dabblers did. In fall, bluebills and canvasback can feed on animal life and don't need plants.

Today, in Chesapeake Bay, the major wintering ground for cans, two clam species, the Rangia and Macoma are its principal foods. But, even there the canvasback of yesterday fed on wild celery and eelgrass, widgeon grass, sago, and clasping leaf pondweeds. Those plants are mostly gone and it is an irony that the Rangia clams they eat now thrive in silty, polluted water. We can only speculate what would happen to Chesapeake Bay canvasbacks if there were a large die-off of clams. They might adapt to another food but the alternatives are very limited.

In the mid-1950's the "fingernail" clam died off on the Illinois River. The result?

"...not only did the Illinois Valley fail to attract large populations of scaup and canvasbacks, but also those that stopped in migration remained more briefly than they formerly did."

Today canvasbacks concentrate at La Crosse and at the Keokuk Pool in Iowa. At La Crosse, they arrive in numbers the third week in October and peak the first of November. Departures occur over the next two weeks. They get to Keokuk in late October, peak by mid-November and remain there until forced out by the freeze-up in December.

Not long ago, in 1970, the number stopping at La Crosse was about 15,000 and the number at Keokuk, 170,000. But vegetation changed at Keokuk and in 1973 more than 100,000 stopped at La Crosse while Keokuk declined to 65,000.

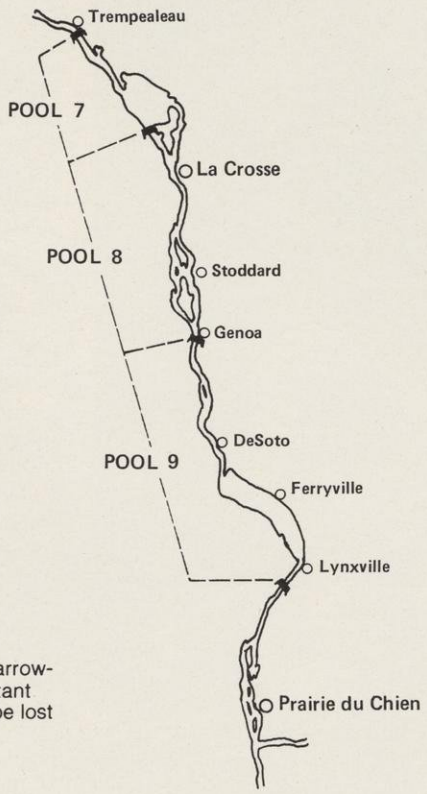
David Trauger, chief of wildlife ecology research for the US Fish and Wildlife Service warns that the Keokuk Pool is in trouble. He says 20 million diving ducks use the area and "heavy metals, toxic chemicals and radioactive materials from industrial and agricultural sources bioconcentrate in the aquatic environment. These substances are known to produce physiological dysfunction and reproductive impairment in various species of wildlife. Canvasbacks...are particularly vulnerable to contamination by these pollutants through the food chain."

Like the Illinois River of the 50's, the Keokuk Pool provides cans with fingernail clams and, likewise, if something happened to the clams, canvasback numbers could crash.

So Lake Onalaska with its wild celery and arrowhead is especially important.

Since 1978, Korschgen has studied food habits of canvasbacks on Lake Onalaska and at Pools Eight and Nine on the Mississippi. He found that they consume primarily a vegetable diet there. A lot of people had assumed otherwise because clams are so important at Keokuk and Chesapeake Bay. Actually, clams are available in the Lake Onalaska area. Other diving ducks there, notably bluebills, feed on them. They also eat mayfly larvae and snails. But the preferred food of the canvasback is the winter bud of wild celery and the tuber of the narrow-leafed arrowhead. These duck delicacies are probably what attracts them to Pool Seven in massive numbers.

Korschgen points out that canvasbacks have special needs during the autumn migration. To make long, nonstop flights they need an abundant food resource so they don't have to




## MAJOR CANVASBACK STOPS IN WISCONSIN

Increased sedimentation and turbidity threaten wild celery and narrow-leaved arrowhead in Pools 7 and 9. These are important diving duck foods. Pool 8 may already be lost to canvasbacks.

spend more energy getting food than they receive from the nutrients.

The carbohydrates in celery and arrowhead contain more calories than protein. This preferred food attracted 192,000 canvasbacks to Pools Seven, Eight and Nine during a one-day census in 1979. Called "carbocharging" by biologists, the birds stuff themselves with calories in preparation for the massive, migratory sweep to Chesapeake Bay.

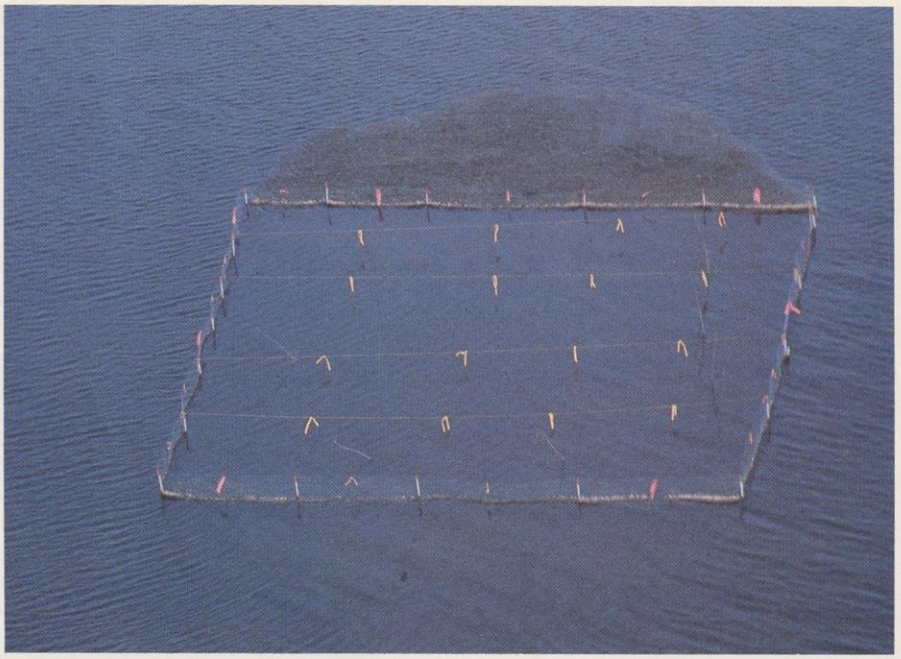
In fall, Mississippi River pools near La Crosse serve as an important staging and resting area. In the spring, lesser numbers use the river but its food resources are vital then because birds are preparing for reproduction.

Dams along the river control water levels for navigation and have also flooded backwaters to create habitat. But there are drawbacks that may make the river near La Crosse less suitable for cans in the future.

Dams mean sedimentation, shallowing and sporadic turbidity. Less sunlight penetrates the water and fragile aquatic species disappear. Habitat becomes shallow, suited to dabbling ducks, not divers.

Sedimentation and turbidity are major problems throughout the Upper Mississippi River. Studies by the Great River Environmental Action Team (GREAT) concluded:

"If the present rate of sedimentation is allowed to continue, most of the open



A waterfowl exclosure in Pool 7 kept ducks away from vegetation. By comparison with areas outside, it helped determine how much wild celery and other plants the birds consumed. **US Fish and Wildlife Service photo by Carl E. Korschgen**

Below: Mississippi River pools on the Wisconsin border are a major staging area where canvasbacks load up on carbohydrate energy for the big flight to Chesapeake Bay.
**US Fish and Wildlife Service photo by Carl E. Korschgen**

water areas of backwater lakes will succeed to marshland within the next century. Prevention at the source is the only solution for extending the existence of the Mississippi River pools and backwater lakes."

Strip-cropping, terraces and diversions could do much to help. GREAT recommends that first priority be given to crop, pasture and forest land needing protection.

It's estimated that 37.7 million acres in Iowa, Wisconsin and Minnesota will need treatment by 1985 to insure long-term survival of the soil base. But only an estimated 9.8 million acres will actually receive protection.

Leonard Johnson, Research and Development Director, for the State Board of Soil and Water Conservation Districts is pessimistic about the fate of the backwaters of the Mississippi.

Top: As habitat declined, canvasbacks were forced to change their staging area from the Illinois River to the Mississippi. **Ducks Unlimited photo by B.J. Rose**

Bottom: Three-fourths of the world's cans migrate through the Upper Mississippi River Wildlife Refuge. Biologists worry that with so many there at one time, an oil spill or disease could mean disaster. **Painting, "Approaching Storm" by John Peterson, courtesy of the artist and Mill Pond Press, 204 S. Nassau St., Venice, FL 33595**

En route to Chesapeake Bay where the main diet is clams. Survival of cans depends on survival of their breeding, staging and wintering areas. **Painting, "Into the Wind" by Gregory C. Caron, courtesy of the artist and Mill Pond Press, 204 S. Nassau St., Venice, FL 33595**

"...I wonder whether we have created a hydraulic regime, with our flood controlling dams and navigational locks, that is simply not compatible with indefinite maintenance of those backwater lakes...The Upper Mississippi River Valley scene that I see on my mental A.D. 2500 videoscreen is not very pretty."

Conservation tillage, and use of other soil conservation techniques may provide a respite for Lake Onalaska. Canvasbacks may benefit. But without expensive treatment, the sediment will win out.

Meantime, two other threats loom. The first is disease. If a contagious virus or bacteria entered the area during peak waterfowl concentrations it could spread rapidly. The second is a major spill of chemicals. This too could kill masses of birds. Many spills have already occurred.

Petroleum products which coat waterfowl feathers are especially deadly. In 1963 oil slicks from a petroleum storage depot and a soybean processor killed some 10,000 waterfowl on the Upper Mississippi. When a barge collided with a wing dam, a slick from another petroleum discharge extended eight miles, from La Crosse to Brownsville, Minnesota. Approximately 30,000 canvasbacks were on Pool Eight at the time, but the slick dispersed without apparent problems.

While disease and spills are serious, they are not permanent. Loss of habitat is another matter. And it's happening.

From 1975 to 1981, 1,200 acres of submergent plants, dominated by wild celery, have disappeared from Pool Eight on the Mississippi River. The pool stretches from La Crosse to Genoa. Celery is a major food not only for canvasback, but also redhead and ringneck ducks. The loss represents 83% of the submergent plant community. Pool Eight use by the cans was once large, but dropped in proportion to the vegetation loss. Reasons for the loss are as yet unclear, but studies are underway. Turbidity, sedimentation, over-fertilization (from municipal and industrial waste discharge), herbicides and plant disease are all suspected.

"Whatever the reason, we've lost Pool Eight," says US Fish and Wildlife Service Biologist Korschgen. "Pool Eight has gone the way of the Illinois River. There is absolutely no doubt about it. "If we lose Pools Seven and Nine, canvasbacks are in more trouble than ever!"

To keep track, federal researchers have tested the amount of vegetation being eaten by waterfowl in Pool Seven, which includes Lake Onalaska. They used 20 exclosures to keep waterfowl from feeding in certain places. Differences in vegetation growth inside and outside the exclosures were then calculated to find out how much was eaten.

"Forty to 45% of total tuber production is harvested," Korschgen says.

During the test years of 1979 and 1980, canvasback production on the northern prairies was very poor and meant fewer ducks cropping vegetation. In years of good production with lots more birds, the amount of food in Pool Seven may limit their use of the pool.

While it's true that the ultimate survival of canvasbacks depends on breeding areas in the prairie-pothole regions of the US and Canada, stops on the migration route are also crucial. Breeding grounds come first. Places like Lake Onalaska will make survival of the the big gray ducks possible if breeding areas are protected. Staging areas and Chesapeake Bay come next. All are bound together in an ecological chain and Wisconsin is fortunate to be one of the links. The challenge is to keep it from breaking.

# The feather connection

Giant Canada geese — once given up as extinct — now grace almost every state and Canadian province. Photo by Rick Hunt

*HAROLD C. HANSON, Senior Scientist, Illinois Natural History Survey, Champaign*
*ROBERT L. JONES, Professor of Agronomy, University of Illinois, Urbana*
*RICHARD A. HUNT, DNR, Wisconsin Wetland Research Supervisor*

**Mineral analysis of certain feathers can pinpoint a migratory bird's breeding ground. Origins of giant Canadian geese at Mecan Springs were determined this way. The technique portends more precise management everywhere for many species.**

Giant Canada geese (Branta canadensis maxima) were rediscovered at Rochester, Minnesota in 1962. This resulted in the realization that, far from being extinct as had been believed, the giants still existed in numerous semi-captive flocks throughout the country. Formerly native to wide areas of the Midwest and eastern parts of the Great Plains, they are the largest of all geese and sometimes weigh up to 20 pounds. Research after the rediscovery established that perhaps 50,000 giant Canadas were then breeding in the wild, principally in Manitoba. Stimulated by this knowledge, a major program to restore them has occurred across North America. Breeding flocks of giants are now found in almost every state and Canadian province, including more than 100,000 birds in the 14 states of the Mississippi Flyway alone.

A main management objective has been to provide hunting opportunities. However, many flocks were established in urban areas, and even though some nuisance problems have occurred, goose viewing on a year-round basis has been a major benefit. Giant Canadas can now be observed close at hand during their entire life cycle. This gives a new perspective to enjoying geese compared with the limited opportunities

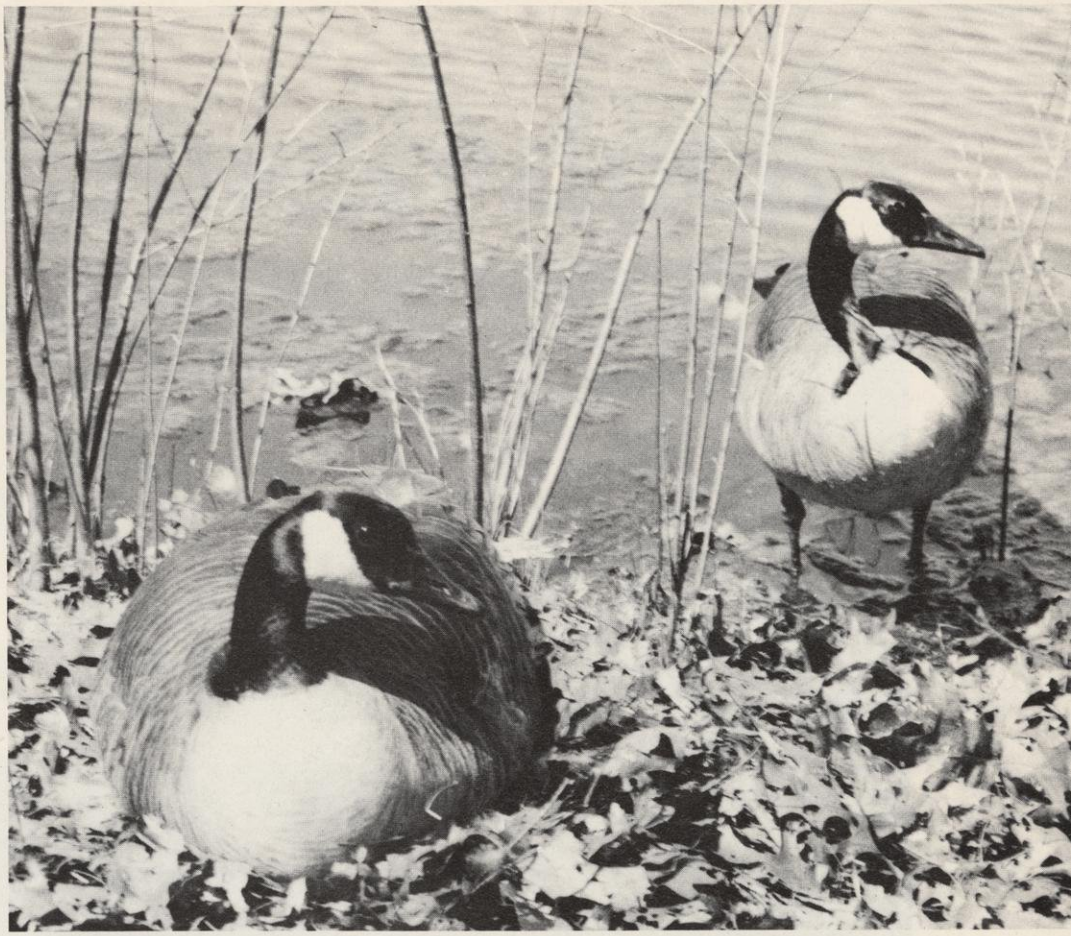
for viewing the more remote migratory "honkers" like those at Horicon and similar places. Most people see the smaller ones only as flocks in the sky when birds migrate to and from their subarctic nesting grounds.

Many giant Canadas breed in Wisconsin. Approximately 4,200 now occur in some 30 counties. These include two free-flying flocks of more than 1,000 each at Bay Beach Wildlife Sanctuary in Green Bay and at Crex Meadows Wildlife Area near Grantsburg in Burnett County. There are also smaller flocks in the following counties: Barron (100 birds); Door (230); Jackson (230); Marathon (300); and Vernon (150). All of these originated from the release of semi-captive stocks. With the exception of birds at Bay Beach Wildlife Sanctuary these flocks migrate to southern refuges in late fall. Survival is evidently good, judging from increasing numbers at each breeding area.

In addition to the summer flocks, Wisconsin also plays host to two populations of giant Canadas that migrate to the state in winter. One uses the Rock Prairie - Turtle Creek refuge near Janesville and the other, the Greenwood Refuge at Mecan Springs near Hancock. Although never numerous by modern standards, both populations of a few thousand birds have been known to winter in these areas since pioneer times. They were the only birds consistently available to hunters prior to the management success at Horicon. The geese that use Horicon and other upper Midwest refuges, however, are totally different. They are smaller and darker and migrate to Wisconsin from northern Ontario, not Manitoba.

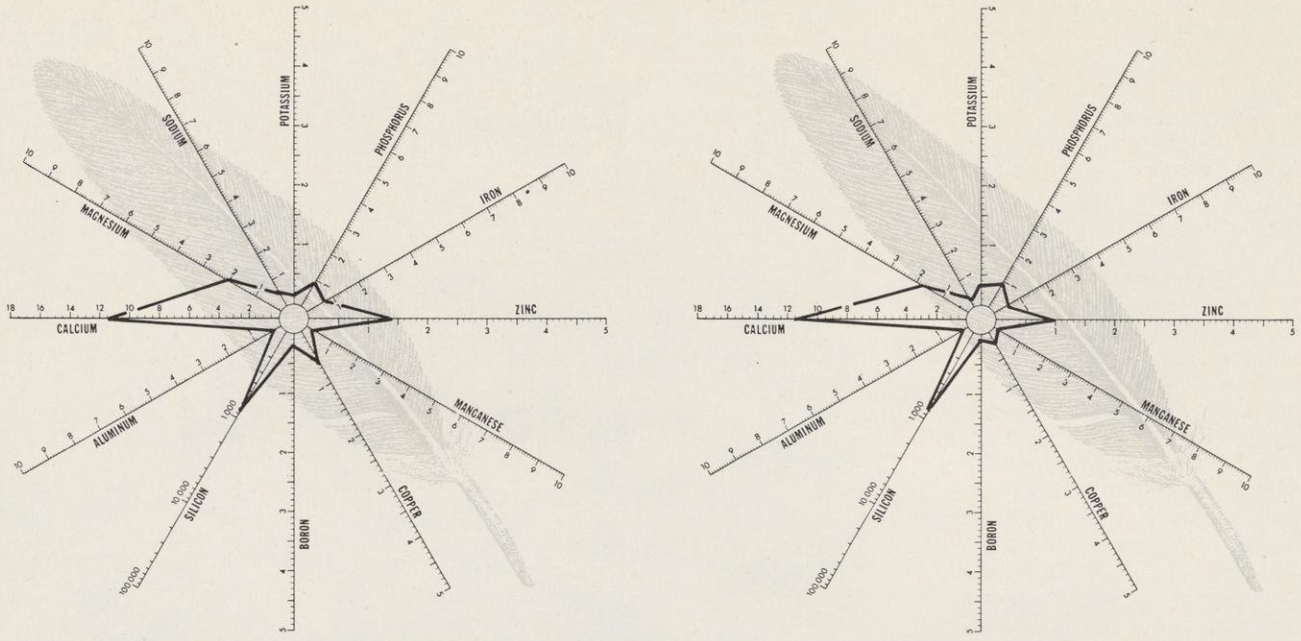
Historically, giant Canadas were reported winter-roosting on Lake Geneva as early as 1838. They fed in farm fields on Rock Prairie and nearby Big Foot Prairie across the line in Illinois. When the lakes froze over, Turtle Creek bottoms in Rock County were used for roosting. Here, watercress and exposed grasses and sedges were available for grazing. A few small groups of hunters avidly pursued these geese, which included some of the largest ever shot in the state. A refuge of leased agricultural lands was first established on the Rock Prairie in 1938 to provide some sanctuary and food.

Location of the breeding range of the Rock Prairie giants was established in the early 1940's as a result of bandings at Alf Hole Sanctuary in extreme southeastern Manitoba. Recoveries showed that Rock County was the terminus for migrant flocks of this population. A major part of the Rock Prairie geese nest in the general area of this small provincial refuge. During the early 1970's, the Rock Prairie winter population declined from a long-term average



Top: The number of giants has swelled to over 100,000 in the Mississippi Flyway alone. About 4,200 breed in Wisconsin. Photo by Dorothy Ferguson

Bottom: Horicon Marsh geese. Their "feather prints" are readily distinguishable from those at Mecan Springs or Rock Prairie. Photo by Dean Tvedt




A long-standing mystery shrouding the origin of giant Canadas at Mecan Springs gave way when feather mineral profiles were compared. Prints on the left from birds at Mecan Springs matched those in the center from Playgreen Lake in Manitoba. The print on the right is from the smaller geese that breed near Hudson Bay. Note the difference in levels of sodium and silicon.

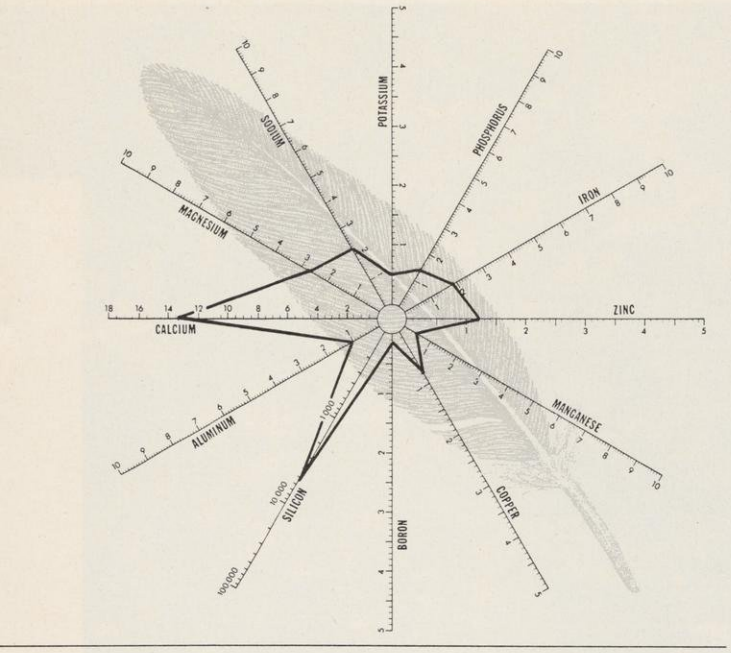
of 4,000 down to about 1,500. Because banding studies had revealed the isolated nature and limited size of the breeding grounds, managers realized that very restrictive hunting regulations were necessary to restore the flock. Applying this knowledge, it was possible to bring the population up to huntable levels again after only three years of total protection.

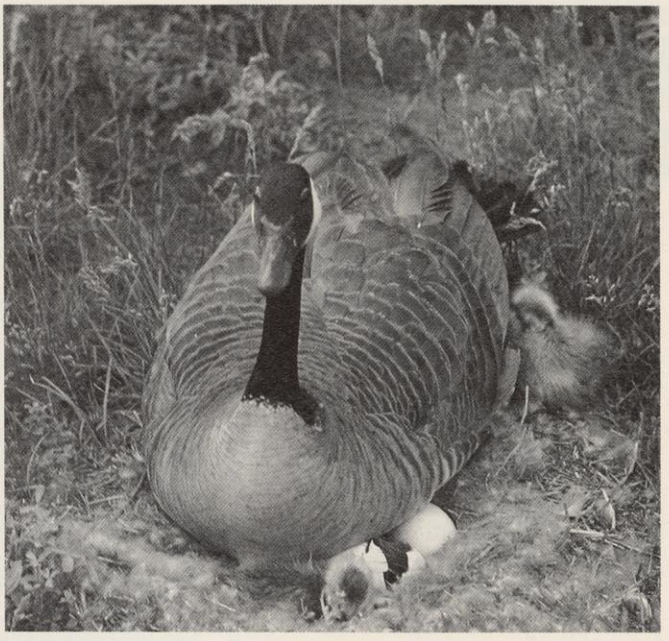
In contrast to the fund of information we now have for the Rock Prairie giants, we know almost nothing about those that winter at Greenwood Refuge and Mecan Springs. Tucked away in a sparsely settled area, this population rarely strays outside a narrow 2 1/2 mile-long flight lane until after hunting season. Harvest has seldom reached 100 geese per year and these are taken by a few local, but persistent, hunters.

Historically, the Mecan Springs giants have been recorded as wintering there and feeding in nearby fields as far back as 1859. In all likelihood, they've wintered at the Springs ever since the last glacier disappeared. Wisconsin citizens are fortunate that the former owner of the present refuge, George O'Conner, and his father, Edward O'Conner had a liking for geese. Edward O'Conner's farm was posted against hunting in 1924, and became a private refuge in 1928. Unable, finally, to maintain the effort and expense of feeding the geese, in 1949 he sold the property to the state as a wildlife refuge. It was later named the Greenwood Refuge. In 1955, a portion of the Mecan Springs valley was purchased as a fish refuge. This also helped protect the geese.

Although banding provided clues that traced the breeding ground of Rock

Minerals picked up on the breeding grounds remain unchanged forever in the wing feathers. **Ducks Unlimited photo**



Urban flocks have made possible intimate viewing of the entire life cycle of giant Canadas.

Giant Canadas from Manitoba have been wintering at the Rock Prairie-Turtle Creek refuge near Janesville since pioneer days. Photo by Elmer Staab, Milwaukee Journal

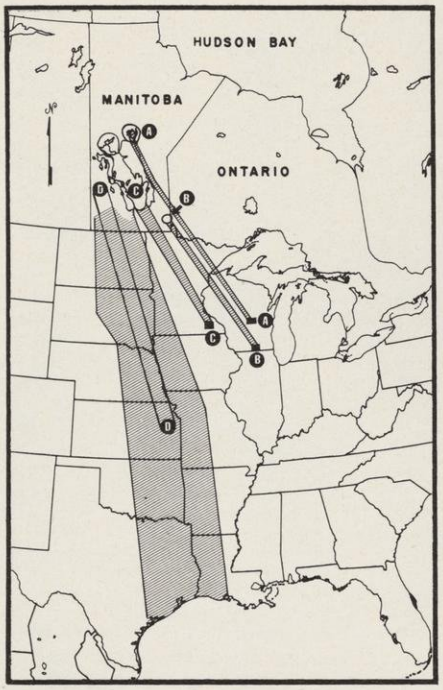
Prairie geese to southeastern Manitoba, there was no such data for the giants at Mecan Springs.

Where they came from was a mystery. In the last few years, however, scientists began taking mineral profiles of feathers from the various flocks of giants. Analysis established a "feather connection" that seems to pinpoint the breeding ground of Mecan Springs geese as an island-studded primitive spot in central Manitoba called Playgreen Lake. This discovery opens the door to better management of the Mecan Springs geese. Mineral analysis techniques show promise not only for management of geese, but for many other species as well.

For geese, the feather mineral profiles are made by burning the vanes of the primary flight feathers of the wing. The ashes are then analyzed in an optical emission spectrograph and an atomic absorption unit.

The analysis gives a specific level for 12 different chemicals—iron, zinc, manganese, copper, boron, silicon, aluminum, calcium, magnesium, sodium, potassium and phosphorus. The amounts that show up in feathers are distinctive enough to pinpoint a location.

Scientists know that the wing feathers a bird grows on the breeding ground reflect the background chemistry of the area. The science that delves into this is called biogeochemistry. The feather minerals are remnants of the food-nutrient chain. They constitute a sort of sensitive featherprint of a location, analogous, in an environmental sense, to a fingerprint. Although after a bird leaves the breeding grounds, additional minerals are absorbed at other loca-




**Geography of Feather Connections**

A feather connection has been made between four giant Canada breeding grounds in Manitoba and wintering grounds in the Midwest.

Part of the giant Canada goose flock at Mecan Springs in Waushara County. Photo by Rick Hunt

tions, these do not override or blur the basic pattern associated with the area where the feathers were grown.

With this knowledge, scientists plotted featherprints from 86 giant Canadas taken by hunters at five different locations in the Midwest. Among the 86, 19 came from Mecan Springs and 18 from the Rock Prairie. These featherprints were compared with others collected at five different locations in Canada. A visual inspection showed similarities. Prints from giant Canadas collected at Playgreen and Kiskitto Lakes near the northeast end of Lake Winnipeg matched those from giant Canadas taken by hunters near Mecan Springs. When fed into a computer, the correlation was confirmed. A feather connection had been established. Not only that, the Mecan mineral patterns were found to be readily distinguishable from the Rock Prairie ones. On the basis of silicon levels alone, 17 of 19 Mecan birds were separable from 18 of 19 Rock Prairie specimens. Among other elements, the ratio of calcium to magnesium and of phosphorus to potassium and iron, separate the Wisconsin populations. Featherprints for the giants are easily distinguishable from those of the Horicon-Southern Illinois type honkers because levels of every mineral are low in the feathers from giants and relatively high in those from honkers.

The fact that a mineral "Feather Connection" exists suggests intriguing possibilities for both research and management. For example, the number of breeding birds and broods observed in the Playgreen-Kiskitto Lake region of Manitoba, suggest more geese are there than currently winter at Mecan Springs. About 750 were counted at Mecan Springs in January of 1981. Research, via banding and radio tracking, could provide information about what becomes of them. Results might show it would be a good thing to buy more land at the Springs to decrease disturbance to the flock. Or it might call for separate management similar to Rock Prairie with a cutback in hunting some years to boost population.

The Mecan geese are a unique resource for both Wisconsin and Manitoba. The isolated, almost pristine Mecan Springs winter site is matched in beauty by the primitive, island-studded, breeding habitat at Playgreen Lake. The "Feather Connection" offers possibilities not only for management of these birds but for many others as well. It is an obvious "tool" for improving knowledge. For example, while all Canada geese are basically similar in appearance, a careful look at any large concentration will show there are several sizes and color variations. In reality, these are expressions of racial or population characteristics. Collections of feathers for mineral prints from hunter-harvested or banded samples throughout wide geographic areas, such as a state or even flyway, would define and refine our concept of racial or population distribution and the relative importance of each one. Management could then be directed at manipulating refuge practices and hunting seasons. No other technique holds more promise for improving our understanding of goose management programs.

# Catch-all

## Toxaphene may cut reproduction in Great Lakes fish

**Robin J. Irwin**
Editorial Assistant

**Madison** — High levels of the pesticide toxaphene have been reported in Great Lakes trout and salmon by the US Fish and Wildlife Service's Great Lakes Fish Laboratory at Ann Arbor, Michigan. It probably gets there as "toxaphene rain" similar to the way acid rain happens.

A 1976 study estimated that 38 million pounds are spread on US field crops annually. **In the South, it is the most popular insecticide to control boll weevils, cutworms and a wide range of other pests on cotton.**

Like its cousin DDT, toxaphene is incredibly long-lived. Research suggests it can remain unchanged in the environment for up to 11 years before breaking down into simpler compounds, and even those chemicals may be harmful.

**Also like DDT, toxaphene is what scientists call "bioaccumulative," meaning it builds to higher and higher levels in the fatty tissue of fish and animals as you ascend the food chain.**

**Toxaphene concentrations discovered so far in the Great Lakes do not pose much danger to humans.**

While the threat to people is low, researchers are concerned about what the pesticide may do to fish.

At sub-lethal levels, the chemical causes calcium to build up excessively and unevenly along a fish's backbone, bringing about what is known as the "bowed back syndrome."

**Biggest concern is what toxaphene does to eggs and fry. Experiments show that when brook trout eggs are exposed to levels even lower than one part per million (ppm), only about one-fifth of them hatch.** This has scientists worried because the US Fish and Wildlife Service's National Fish Research Laboratory at Columbia, Missouri, has detected levels from six to 11 parts per million — with most ranging from seven to eight — in otherwise seemingly healthy adult lake trout. Toxaphene may explain mysterious die-offs of young trout and salmon fry at Great Lakes fish hatcheries.

The toxaphene revelation may answer other questions. Last year a University of Wisconsin Sea Grant Institute experiment found that eggs taken from Lake Michigan lake trout, hatched and reared in Lake Michigan water, all died within four months. Yet, eggs taken from Lake Superior fish lived, even though kept in the same water. **The evidence pointed to something being passed on through the eggs from adult fish to fry. Now scientists have reason to suspect it might be toxaphene.**

The toxaphene sprayed on cotton in the South gets into the Great Lakes from the atmosphere as "toxaphene rain." Some 50 to 60% of it evaporates within 58 days and becomes airborne long before it breaks down. **The chemical has turned up in lake trout from a totally landlocked lake on Isle Royale in Lake Superior.**

Because of this pervasiveness, toxicity and the difficulty of identifying the chemical in the environment, toxaphene has been banned in New York, New Hampshire and Connecticut. California is considering such a prohibition and Arizona has an 18-month moratorium against using the product. It has been likewise banned or restricted in Canada, Sweden, Finland, Denmark, France, Switzerland, Hungary, Italy, Algeria and the United Kingdom. Use of the chemical in Wisconsin is insignificant.

However even if there were a national prohibition in the US, there is no guarantee reproductive failure in Great Lakes trout would be corrected.

"We can't identify 80% of the chemicals that show up on testing equipment," says Wayne Wilford of the Great Lakes Fish Research Lab. "That represents something like 476 compounds — of which toxaphene, until recently, was just one. Toxaphene looks like a likely culprit, but the other 475 could also be working separately or together to harm fish in the Great Lakes."

Researcher Ross Horrall checks incubation trays at Sea Grant's experimental lake trout hatchery in Kewaunee. Some scientists now think toxaphene, recently found in Lake Michigan trout, may be linked to their reproductive failure and to occasional, mysterious die-offs of fry in hatcheries. Photo by Rick Evans, UW Sea Grant Institute.

## Bluebird data needed

**Camp McCoy** — Two scientists here, studying ways to bring bluebirds back, want help from other bluebird fanciers.

Biologists Kim Mello and Steven Kruger need more information about bluebird habitat preference and competition from house sparrows. If you maintain a "bluebird trail" or know someone who does, write: Commander, Fort McCoy, ATTN: Kim Mello (LMB), Sparta, WI 54666, or phone (608) 388-2252 or 372-2859.

# New guncase rule

**Madison** — At the urging of the state legislature, DNR has drafted a new rule making it harder for a poacher, road-hunter, deer-shiner or other firearms violator to carry a loaded gun in an automobile.

**The rule says that a gun must be "fully closed by being zipped, snapped, buckled, tied or otherwise fastened with no portion of the firearm showing within a gun case expressly made for that purpose."**

In the past, some courts ruled that unfastened gun cases or such makeshift enclosures as nylon stockings or bluejean pantlegs met the letter of the law, even though they allowed lawbreakers to quickly unload a gun in an automobile before a warden could catch them at it.

The new rule will correct such abuses. It does not outlaw homemade cases. **However, pistol holsters are no longer legal for transporting handguns in a motor vehicle. Pistols in the future will have to be completed covered in a fully closeable case.**

The new rule has been approved by the Natural Resources Board and is expected to receive legislative okay in time to go into effect this fall.

# Map sources

Wisconsin maps for various purposes are available from a number of sources. They include:

***Public Hunting Grounds***

Shows federal, state and county lands. Request Public Lands Open to Hunting map, Wisconsin Department of Natural Resources, Box 7921, Madison, WI 53707.

***County Maps***

Document Sales, Wisconsin Department of Transportation, Box 7713, Madison, WI 53707.

Also from the Clarkson Company, 724 Desnoyer, Kaukauna, WI 54130.

***County Plat Maps***

Available at each county courthouse or from Rockford Map Publishers, Box 6126, Rockford, IL 61125.

***Topographic Maps***

Map and Publication Sales, Wisconsin Geological and Natural History Survey, 1815 University Avenue, Madison, WI 53706.

***Aerial Photographs***

Special Services Section, Wisconsin Department of Transportation, Box 7916, Madison, WI 53707.

***Lakes***

The Clarkson Company, 724 Desnoyer, Kaukauna, WI 54130.

***Mississippi River***

District Engineer, US Army Corps of Engineers, 1217 US Post Office and Customs House, St. Paul, MN 55101.

***Fox and Wolf Rivers***

District Engineer, US Army Corps of Engineers, 219 S. Dearborn Street, Chicago, IL 60604.

***State Forests***

Department of Natural Resources, Bureau of Forestry, Box 7921, Madison, WI 53707.

***Federal Forests***

Forest Service — USDA, 633 W. Wisconsin Avenue, Milwaukee, WI 53203.

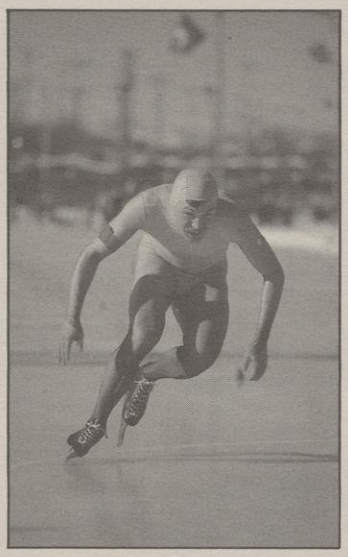
***Timber Companies***

At least one major timber company issues maps of its holdings. Write Consolidated Papers, Inc., Public Affairs Department, Box 50, Wisconsin Rapids, WI 54494.

You can also obtain DNR and US Forest Service maps from local agency offices. Lands under the Forest Crop Law are open to public hunting and listed in many county plat books; local DNR foresters also have information on these lands. Project Respect lands are open to public hunting with the landowner's permission.

# Olympic rink remains open

**West Allis** — A foundation has raised more than $70,000 for the Olympic Ice Rink here and is in the process of negotiating a contract with DNR to operate it for three years. The 400-meter oval, the only US rink that meets Olympic speed skating standards, came close to closing when DNR was forced to cut budgets there for 1982-'83.



Speed skater at the Olympic Ice Rink in West Allis. When DNR was forced to make budget cuts, a private foundation raised enough money to keep the rink operating.

The day after the announcement, local, regional and national skating enthusiasts formed an Olympic Ice Rink Operating Corporation and started an Olympic Ice Rink Foundation to raise the $74,000 DNR was forced to cut. **To help the corporation, DNR may be able to allocate up to $15,000 for the rink. In addition, user fees and concessions will bring in $30 to $35,000 annually. Total expenses amount to about $120,000 per year.**

The rink, which is also open to the public for general use, is credited with American speed skating success in the Olympics. Wisconsin's famous Beth and Eric Heiden and Leah and Peter Mueller train here with skaters from throughout the country.

The Olympic Ice Rink was among 13 state parks to have operating money cut out of the 1982-'83 DNR budget.

# National Hunting and Fishing Day

**Madison** — This year's National Hunting and Fishing Day, Saturday, September 25th, culminates International Hunter Education Week which runs September 19 through 25.

The National Shooting Sports Foundation, which sponsors the event nationwide, points out that more than $4 billion in hunting license fees, special taxes on sporting arms and ammunition, and duck stamps have been funneled into wildlife conservation over the past 60 years. A variety of Wisconsin conservation clubs and DNR offices will sponsor exhibits and other activities at various locations throughout the state. Included will be such things as hunting dog demonstrations, gun safety exhibitions, taxidermy displays and live waterfowl exhibits. Hunting and Fishing Day posters by junior and senior high school students will be displayed. Last year, Wisconsin students won nine awards with cash payments ranging from $50 to $250 each.

Besides schools, 4-H clubs will also take part in a poster contest coordinated by Scott Craven, wildlife specialist at the UW-Extension. Craven will speak on National Hunting and Fishing Day over WHA radio's "Wisconsin Here and Now" program from 11:45 to 12:45 on Friday, September 24.



*Catch-all continued after Hunter's Almanac*

# HUNTER'S ALMANAC '82

## Hunter's choice great, but no guarantee

Last year, Wisconsin gun hunters took home more deer than in any season since DNR started keeping track in the 50's — perhaps more than in any season ever. The nearly 167,000 whitetails bagged last fall included some 62,000 antlerless deer taken on permits.

Not all those holding permits shot does. Some 10,000 permit holders took antlered bucks. Close to 70% of the permit holders tagged a deer.

But a lot of people are still unhappy with the system — particularly, those yet to receive a permit. Any hunter who applies unsuccessfully one year gets a first-draw "preference" the following year. Many mistakenly thought that this would guarantee them a permit. But last year, about 65,000 applicants with preference didn't make it for the second year in a row. It all depends on where you hunt.

One area with a lot of disappointed hunters was Clark, Monroe and eastern Jackson Counties' popular Unit 55 — consistently one of the state's all-time top deer producing spots. More than 21,000 hunters applied for only 4,125 permits available there.

Over 11,000 had preference, based on not receiving one the year before. Obviously, nearly 10,000 who applied for the first time did not receive permits. But neither did almost two-thirds — 7,276, to be exact — who did have preference.

Yet right next door in western Jackson and eastern Trempealeau Counties' Unit 59C, the odds were much better. Unit 59C had 4,575 permits available, the only area with an even larger quota than heavily hunted Unit 55. Only 247 of those with preference were turned down in Trempealeau County, although more than 8,000 who didn't have it also went without.

In fact, there were 13 quota areas where permits were left over after all preference applications were processed. And in one area, Unit 82, all those who applied received permits — with or without preference. But before you jump to get your application in there for this year, consider that Unit 82 consists entirely of tiny Chambers Island, high in the throat of Green Bay. The island is all privately owned, so it takes landowner permission, a snug cabin-cruiser and a strong constitution to brave Lake Michigan's November winds to get there during deer season.

Statewide, nearly 350,000 hunters sought 108,000 available hunter's choice permits last year, so almost one in three was successful. Those with preference faired even better, with more than two in three obtaining one.

The 13 units with more permits than hunters with preference were 1, 6, 7, 24, 28, 63A, 70C, 70D, 70E, 75, 77A, 78 and 82. After all the preference applicants received permits, remaining ones were awarded either to those who hadn't applied at all the year before or to others who had actually received a permit.

Based on last year's records, in nearly half the units, hunters with preference this year will stand a better than 50-50 chance of receiving a permit. This year, units 36, 40, 61B and 81 will have permits again or for the first time. Unit 67 has been split into two parts, A & B. Only one unit that previously had permits — 31 in Oneida County — will not this year.

The best odds for receiving a hunter's choice permit are either to apply where more are offered or where few apply.

But you'll still be subject to the luck of the draw. There are no guarantees. □

*Unless otherwise specified, special licenses and permits can be obtained from local DNR offices or by writing: DNR License Section, Box 7921, Madison, WI 53707.*

## Cheats pay $20,000

At least 257 individuals who fraudulently obtained hunter's choice deer permits last fall have paid $20,000 in fines and court costs. An additional 203 cases are still pending. Five out of every six persons prosecuted so far have been convicted. Many also lost deer hunting privileges for a year or more.

The hunter's choice permit allows the holder to take a deer of either sex. Residents who apply unsuccessfully one year are eligible for first-draw "preference" the following year. The 257 convicted so far falsely stated they had not received a permit the previous year, were given preference and issued a permit.

The prosecutions arose when a computer check last fall kicked out the names of more than 2,500 suspects who received permits in both 1980 and '81. Of these, 1,400 were rated as potentially fraudulent and referred to field wardens for further investigation.

Most turned out to be legitimate — for example, a father and son with the same name, living at the same address and receiving permits in alternate years.

In all, 908 such cases were investigated and found to be legal. Of the remainder, 303 have gone to trial so far and five out of six resulted in convictions. Fines averaged $77.65.

But some paid more. One Milwaukee man was assessed $192 for fraudulently obtaining the permit, $192 for hunting without a valid license, plus an additional $175 in restitution for the killed deer. He also lost all hunting, fishing and trapping privileges for three years.

Several suspects were turned in via citizen complaints. □

# New laws and rules

## *Transporting deer*

Allows anyone, whether they possess a hunting license or not, to transport a deer after it has been legally tagged and registered. Rules no longer require hunters to transport their own deer. They can now send it home with a friend or relative.

## *Deer with handguns*

This year for the first time, Wisconsin hunters can use magnum handguns in .357, .41 and .44 calibers as legal firearms to hunt deer. Such pistols must have a barrel length of 5½ inches or more. Wisconsin is the 33rd state to allow handguns for big game hunting.

## *Bucks and does along the Mississippi*

Three deer management units along the Mississippi River (Zone B1) will have a two-day either sex-season this fall, followed by a seven-day bucks-only season. The units are 61, 59d and 74a.

## *Who's a hunter?*

From now on, anyone who participates in any way in the act of hunting will be considered a hunter. In the past, many individuals — especially nonresidents — have taken part in hunts by spotting, tracking and driving game or handling dogs without ever actually carrying a gun or shooting anything. This rule redefines "hunter" and "hunting" so that these people are now required to purchase a license.

## *Quail bag increased*

The daily bag limit for quail increases from two to five this year, and the total possession limit from four to 10. Populations of this little game bird are very local, but now high enough where present, to let hunters take home more of them.

## *More bear baits legal*

In the past, legal baits have been limited to apples, pastry and liquid scent. This new rule expands the list to include all fruit, vegetables and grains (except for waterfowl hunting). Hunters requested the change to give them a wider range of legal and convenient bait material.

## *Resident preference on raccoon*

Beginning this fall, nonresidents will not be able to hunt raccoons until two weeks after the season opens for residents. Established primarily at the request of southwestern Wisconsin residents, the new rule gives in-staters first crack at raccoon before the annual deluge of nonresident hunters moves in. Many states bordering Wisconsin have comparable regulations.

## *No RV's in rivers or lakes*

This new law prohibits operating a motor vehicle in navigable waters. It is now illegal for four wheel drive and other off-road vehicles to drive in water along state beaches and sandbars. Exceptions are allowed for crossing streams, for agricultural implements, amphibious vehicles and other permissible activity.

## *Hunting from airplanes*

The Legislature has increased penalties for hunting from airplanes. For the first time, the plane may be seized as a public nuisance. Persons caught shooting from the air now face a $1,000 fine and up to 90 days in jail. Such violations have been a substantial, albeit local problem in a small number of areas in the state.

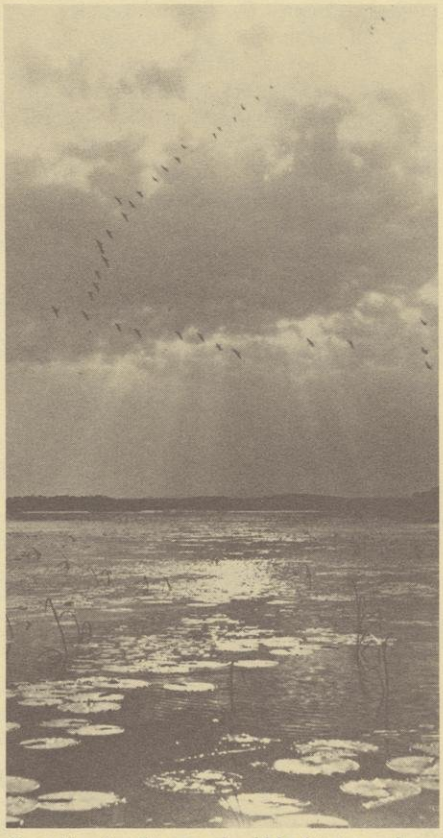
## *Pilfered pelts*

The fine for molesting or stealing traps or their contents increased this year to a minimum of $300. Trappers hope this will help stop theft and vandalism. □

# Special hunts

## *Sandhill Experimental Wildlife Area*

A three-day deer hunt here begins one week prior to the statewide season. The area is currently being managed to cull small deer and maximize the number of large, full-antlered trophy bucks. On the



**Goose hunting this year should be fair to good.**

## 1982 DEADLINES

Applications must be on DNR forms, which must be obtained ahead of time from agency offices, county clerks or license outlets.

- **Hunter's Choice Deer:** *Postmarked* no later than October 1.
- **Canada goose Horicon Zone, Central Zone:** Postmarked no later than September 10.
- **Canada goose Mississippi Valley Population (MVP) Zone:** Applies to 16 counties surrounding Horicon Zone. No deadline.
- **Turkey:** *Postmarked* no later than October 1.
- **Sandhill Area deer hunt:** *Postmarked* no later than October 1, 1982.
- **Disabled:** Permit to hunt or shoot from a standing automobile. Apply to your local warden at least 10 days before date of use. □

first day, permit holders can take one deer of either sex, including antlered bucks. First-day permits are issued by advance reservation only. Applications must be postmarked no later than October 1. On subsequent days, hunters may take either does or spike bucks with antlers less than three inches long. Permits for these days are issued strictly on a first-come, first-serve basis at the gate. Daily permits for small game are also available at the facility's office near Babcock.

## *Chambers Island*

Beginning this year, Chambers Island (Unit 82) will be experimentally managed for trophy bucks. Both gun and bow hunters will be restricted either to does or spike bucks. In a few years, when the mature buck population expands, a trophy hunt will be scheduled. The island's unique, isolated position — in the middle of Green Bay, makes it ideal for such managment. A University of Wisconsin-Stevens Point research team will monitor the experiment. A hunter's choice permit is required to shoot antlerless deer, but no other special license is necessary. The island is privately owned.

## *Bong State Recreation Area*

Daily permit hunting started at Bong last year. The area features duck hunting from state-supplied blinds and both-sex pheasant hunting. The number of hunters at any one time is restricted, so reservations are advised. Apply on DNR forms until August 31. If all openings are not filled by that date, applications will continue to be taken until they are. Write: DNR, Route 1, Box 141B, Kansasville, WI 53139.

## *Muzzle-loader-only deer hunt*

Governor Dodge (Unit 70E), Blue Mound (70D) and Perrot (61A) State Parks are restricted to hunters carrying muzzle-loading rifles and holding hunter's choice permits for these quota areas.

## *Fort McCoy Military Reservation*

An annual, two-day, either-sex deer hunt will be held November 6 & 7. For information write to: MSA hunting/. fishing permits, Sparta, WI 54656. □

## Dates and outlook

| Game Species | 1982 Dates and Locations | Game Supply* | Hunting Prospects** |
|---|---|---|---|
| Coyote | Statewide all year, except closed during gun deer season in Units 1, 4, 8 and 32 | No Change | Fair-Good. Best in north. |
| Snowshoe Hare | Open all year, statewide | Down | Good. Best in north. |
| Turkey | 4 Units — 3 hunting periods between April 21 and May 9, 1983 | Improving | Best in southwest counties along Mississippi River. |
| Ducks | Statewide, dates published about Sept. 15 | No Change | Fair-Good. Best along Mississippi River, also southeast ¼. |
| Canada Geese | Statewide, dates published about Sept. 15 | No Change | Fair-Good. Best in east central portion of the state. |
| Woodcock | Statewide, dates published about Sept. 15 | Up | Good. Best in northern ⅓ of state. |
| Bear | Bow: North of Hwy. 29, Sept. 11-Nov. 14<br>South of Hwy. 29, Sept. 18-Nov. 14<br>Gun: North of Hwy. 29, Sept. 11-Sept. 26 | Down | Good. Best in northern forests. |
| Gray and Fox Squirrel | Sept. 18-Jan. 31, statewide | Down | Good. Best in southern ⅓ of state. |
| Jackrabbit | Oct. 2-Oct. 31 | No Change | Poor. Not abundant in any region. |
| Cottontail Rabbit | North - Oct. 2-Feb. 28<br>South - Oct. 30-Feb. 28 | Up | Good-Excellent. Best in southern ⅓ of state. |
| Ruffed Grouse | North - Oct. 2-Dec. 31<br>South - Oct. 2-Jan. 31 | Down | Fair-Good. Best in western Wisconsin. |
| Sharp-tailed Grouse | North only, Oct. 16-Nov. 7 | Down | Poor. Not abundant in any region. |
| Raccoon | Oct. 16-Jan. 31, statewide | No Change | Good. Best in southwest and west central. |
| Bobwhite Quail | Southwest ⅓ only, Oct. 30-Dec. 12 | Down | Fair. Best north of Wisconsin River in southwest Wisconsin. |
| Pheasant | Oct. 30-Dec. 12, statewide | Down | Poor to Fair. Best in southeast ¼ of the state. |
| Hungarian Partridge | Southeast ½, Oct.30-Dec. 12 | No Change | Fair. Best in counties near Lake Winnebago and Lake Michigan. |
| Red and Gray Fox | Statewide, Oct. 30-Jan. 31 | No Change | Fair-Good. Best in west central and southern parts of state. |
| Bobcat | North of Hwy. 64, Oct. 30-Jan. 31 | No Change | Poor. Not abundant in any region. |
| Deer | Gun: General, Nov. 20-Nov. 28<br>Bow: Statewide, Sept. 18-Nov. 14<br>Dec. 4-Dec. 31 | No Change | Excellent. Most deer in central Wisconsin, trophy opportunities in north. |

***Compared to 1981**
****Chances that an average hunter will find game in good range.**

# Turkey season

This spring, 1,200 lucky Wisconsin hunters will get a chance to participate in the first state turkey hunt since 1968. Turkeys stocked by DNR in the steep hills of southwestern Wisconsin have taken hold phenomenally. In 1976, there were only 29 birds, then by 1978, 300 — and more than 700 by 1980. Last spring DNR wildlife biologists estimated the breeding population in prime habitats of Vernon and Crawford Counties at about 1,600 mature birds. This spring, the total jumped to around 3,000. By the opening of next spring's season, barring an extremely severe winter, there should be nearly 6,000.

Turkeys have an on-again, off-again history in Wisconsin which is the northern boundary of turkey range — a line that shifts north or south with good winters or bad. At the time of white settlement, gobblers were native here, but disappeared as plows and fire changed habitat. The last turkey was shot in Grant County in 1872. The last authentic sighting was in 1881 in Lafayette County.

Thereafter, periodic stocking attempts mostly failed. One, in the Central Wisconsin Conservation Area near Necedah expanded enough to allow limited hunting from 1966 to 1968. But severe winters, wet springs and disease have combined to keep the population low there since then. However, thanks to mild weather the last few years, a limited turkey hunt can also be held in the area this spring.

Wildlife managers expect 6,000 to 8,000 applicants for the 1,200 permits to be issued this winter. Success rates from other states suggest that only 10-20% — roughly 100-200 hunters — will bag a bird.

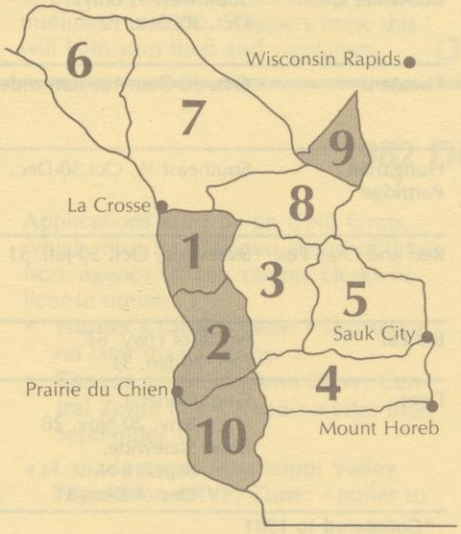
Few Wisconsin hunters have knowledge or experience with gobblers. Therefore, DNR and the Wisconsin Wild Turkey Federation will present several two-hour orientation and training sessions prior to the hunt in various locations around the state. Successful permit applicants are advised to attend, but anyone interested is welcome. The turkey season will be open during three consecutive Thursday through Monday periods between April 21 and May 9, with shooting hours from a half-hour before sunrise to noon. Only bearded turkeys may be shot. Research shows that from mid-April to mid-May, the males are still interested in breeding and thus active, mobile and gobbling. Females, on the other hand, have already started to lay eggs and are likely to be on the nest until at least noon, so hunting early in the day during this time period minimizes disturbance to brooding hens.

Landowners possessing at least 50 acres within an open turkey zone will get first crack at up to 20% of the available permits, the first time such landowner preference has been granted in Wisconsin. If they wish, landowners may assign this preference to a tenant or immediate family member. Those who receive permits must then keep their lands open to other turkey hunters who ask permission to hunt. Ten turkey zones have been established in the state's west and southwest, but only four will be open this spring.

The season limit is one bearded turkey per license holder. All birds must be tagged and registered at DNR stations before 3 p.m. on the day of the kill. Only bows and shotguns are allowed and only turkey calls may be used — no tape recordings or records.

The most successful way to bag a turkey is to camouflage yourself and use a call to bring the bird in close. It's also the safest. Moving through the woods after a gobbler is not only fruitless, but downright foolhardy. Other states report a higher percentage of hunting accidents during turkey season than at any other time of the year, including the fall deer hunt.

Permit applications are due October 1. They may be obtained from DNR field stations, county clerks and private license outlets. □




**Ten turkey-hunting zones have been set up in the west and southwest. Four will be open this spring.**

# Hunting accidents

Hunting accidents in Wisconsin last year were the second lowest since the state began keeping records 31 years ago. In 1981 110 accidents occurred, one more than the 109 reported in 1980. Five people were killed during 1981 — two during the deer gun season, one in bow season, one while hunting squirrels, and one hunting grouse.

Faulty hunter judgment contributed to 42% of the accidents, including four of the five fatalities, and another 41% including the other fatality, were self-inflicted. Errors in judgment included not being able to see the victim, shooting the victim while swinging on game, victim moving into the line of fire, or mistaking the victim for game. Self-inflicted injuries occurred most often when a hunter stumbled and fell. Others shot themselves when their guns were not resting securely enough and fell, when the trigger caught on an object, or when the gun misfired.

Most of the accidents (96) happened during regular daylight hours, with a total of only 14 occurring during dawn, darkness or dusk.

The majority of victims (68%), as well as those who accidentally shot them (61%), claimed over five years of hunting experience. Only 20% of the victims and 29% of the identified shooters were under age 18.

DNR credits the hunter education program begun 15 years ago with reducing accidents. One third of this past year's victims and a quarter of their shooters had graduated from the program. □

# Catch-all

CONTINUED

## $1,000 fines for killing Wisconsin eagle

**Hayward** — Two Missouri men were recently convicted of killing a two-year-old bald eagle that had migrated from northern Wisconsin. Melvin A. Schneir, 32, and Ronald L. Stearns, 30, pled guilty to charges of violating the Federal Eagle Act. The men shot the bird with a .22-calibre rifle along the banks of the Mississippi River near Perryville, Missouri.

**Schneir and Stearns were each fined $1,000, received a suspended one-year jail sentence and lost their hunting and fishing privileges for three years.**

**The immature bird was originally banded by Chuck Sindelar and Ron Eckstein during a thunderstorm on June 8, 1980. It was one of three eaglets in a nest high atop a white pine overlooking Tyner Lake, an arm of the Chippewa Flowage in Sawyer County near Hayward.**

Sindelar bands and surveys eagles under a small DNR grant. Eckstein, a DNR wildlife manager from Rhinelander, helps out in his spare time.

Sindelar has banded more than 2,000 Wisconsin eagles in the 18 years he has been studying the birds. He says it's not unusual to get word that one of the birds he banded has been killed.

**"A lot of eagles get shot, but ordinarily there are few convictions," he says. "Usually they are just found dead."**

Sindelar and Eckstein say that young eagles like the one shot in Missouri, are often forced south in their search for food after Wisconsin freezes up in winter. The two-year-old was probably on its way back north when shot at the end of February, Eckstein says.

**"Eagles usually return to the same state and even the same county where they were hatched," he says. "But that's one that won't be coming back."**

"Mourning Doves" is one of two paintings by Wisconsin Artist Martin Murk, selected for exhibit at the Leigh Yawkey Woodson Art Museum Sept. 11 through Oct. 24. Murk lives at Rt. 1, Box 32B, Eagle, WI 53119.

## Bird art

**Wausau** — The widely acclaimed bird art exhibit held each year at the Leigh Yawkey Woodson Art Museum here will run from September 11 through October 24. Singled out for honors as the 1982 Master Wildlife Artist of the year is Robert Bateman of Milton, Ontario whose work is often featured in *Wisconsin Natural Resources* magazine. Five paintings and a bronze sculpture by Bateman will be exhibited.

**The show features top notch bird art by 75 painters and 23 sculptors from around the world, including 15 from Wisconsin. Among those selected from Wisconsin are Martin Murk, Owen Gromme, Bill Koelpin, Wayne Anderson and Bill Schultz.** Featured old master this year is the late Canadian bird artist, Allan Brooks (1869-1946).

## Sorry, wrong numbers

**Madison** — Phone numbers of state canoe clubs listed in our July-August issue were wrong. This is the correct information:

The Wisconsin Sierra Club contact is now Larry Zibbell, **6561 Hill Ridge Drive, Greendale, WI 53219, phone 414-424-2959.** The Wolf River Canoe Club phone number is **715-882-2182.** Number for the Madison Canoe and Kayak Club is **715-882-5400.** The Wausau Canoe and Kayak Club can be reached at **802 Sixth St., Mosinee, WI 54455.**

The magazine regrets any inconvenience it may have caused.

## Coming attractions . . .

November-December: Bezoars, the magic madstones found in deer.

***Trophy hunt at Sandhill.

***Historic trees.

Upcoming next spring: A special supplement on Wisconsin groundwater.

Next summer another on The North.

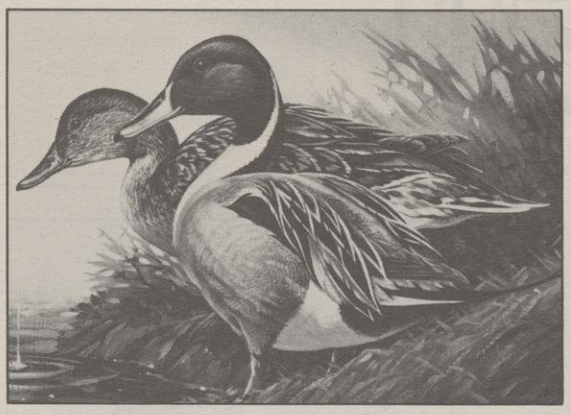
## $3 million for Sea Grant

**Madison** — Strong support in Congress has resulted in a $1.9 million appropriation to keep the University of Wisconsin Sea Grant program alive. The funds will come from the National Oceanic and Atmospheric Administration (NOAH). They will be matched by $1 million in state, university and private funds for continued Great Lakes research, education and public-service activities. The program is the fourth largest in the nation.

**The grant represents no cutback for the UW group, despite a 15% reduction in Sea Grant allocations nationwide.**

Sea Grant Director Robert Ragotzkie says that federal budget cuts elsewhere make the Sea Grant Program the main institution doing research on the Great Lakes. **A major effort over the next two years will focus on improving water quality in Green Bay.**

# Wisconsin license sales up



These pintails by artist Bill Koelpin of Hartland are Wisconsin's 1982 Waterfowl Stamp. Duck and goose hunters purchased more than one hundred and two thousand of the stamps last year.

**Madison** — Sagging economy notwithstanding, Americans spent a record $455 million on hunting and fishing licenses, tags, permits and stamps during fiscal 1981 — $37 million more than the year before. **Data released by the US Fish and Wildlife Service also reveals that once again Wisconsin sold more nonresident fishing licenses than any other state. Wisconsin has led the nation in nonresident sales for 30 of the past 32 years.** Overall, the Badger state ranks fifth in the number of both resident and nonresident fishing licenses sold after California, Texas, Michigan and Missouri. Wisconsin also ranks fifth in sale of hunting licenses following Pennsylvania, Michigan, Texas and New York.

**Purchase of resident Wisconsin archery licenses last year was up by 18,000 to 167,000. Resident and nonresident fishing licenses were up about 17,000 each. Deer, including sports licenses were up some 10,000 to a total of nearly 614,700.**

**By contrast, there was a drop of 9.3% in purchase of Wisconsin waterfowl stamps.** According to Migratory Waterfowl Specialist John Wetzel, sales probably fell off because flight predictions were not good last year and because when money is tight, hunters tend to choose deer hunting over duck hunting.

License Section Chief Douglas E. Poole attributes the overall license sale increases to more leisure time resulting from unemployment and to people using fish and game to stretch food budgets.

**Forest and park admission stickers also showed a slight increase in sales.**

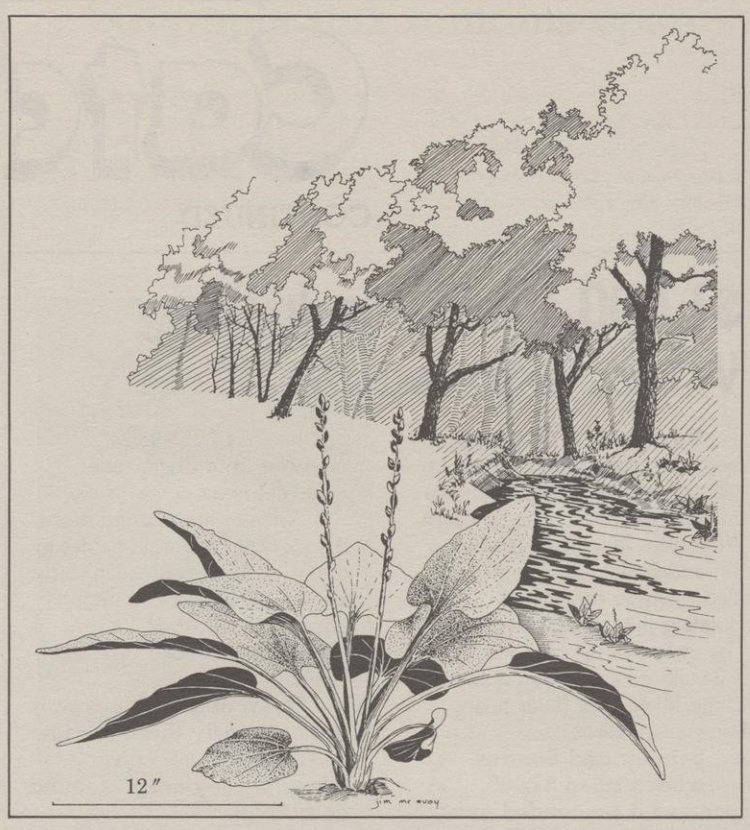
## Petrified Lightning

This natural curiosity known as fulgurite is formed when lightning strikes a sandy area. The intense heat and energy fuses the sand into a hollow tube of pure glass, coated with sand particles.

Fulgurites are extremely fragile and usually found only in short pieces.

This exceptionally long specimen, mounted on a foam board, is held by Kohler-Andrae State Park Naturalist Jon Cowan. It was discovered near Spring Green by Earl and Betty Rasmussen of Ripon and is on loan to the Sanderling Nature Center at Kohler-Andrae.

Photo courtesy Sheboygan Press




Heart-leaved Plantain

# Plant protects plant

**Oak Creek** — Air Products and Chemicals Inc. here has contributed $5,000 to DNR and UW-Milwaukee for research on the endangered heart-leaved plantain *(Plantago cordato)* that grows downstream from the firm's new building site on the Root River. The last 10 plants in the state are located there.

The money is being used to find a way to grow the plants in a greenhouse so that they can be transplanted to other state and county lands.

**Those along the Root River were threatened by increased erosion and rainstorm runoff from the building site.**

**Air Products, however, has responded like a good neighbor and modified the site to minimize runoff and control erosion.**

The Natural Resources Board recently cited the corporation for its efforts. The company treats oxygen for hospital and industrial use.

# Striper hybrids in Wisconsin

**Portage** — Striped bass, related to the lunkers that inhabit the Atlantic Ocean, have been stocked in the 500-acre cooling pond at Wisconsin Power and Light Company's Columbia power plant near here. The fish are a hybrid between true saltwater stripers and freshwater white bass and are stocked heavily in southern US reservoirs.

Planted in Lake Columbia as fry and fingerlings, some already weigh about a pound now and could grow to two or three by 1983. In five or six years, fish managers say they could weigh 10 to 12 pounds. Total hybrid stocking amounted to 10,000 fingerlings and 450,000 fry. The fry were furnished by the state of South Carolina and the fingerlings by Virginia and Tennessee.

Generally, Wisconsin lakes get too cold in winter for striped bass, but Lake Columbia's water is warmed by waste heat pumped there from the power plant.

# The Readers Write...

In Thomas Sheffy's article "Building an Umbrella for Acid Rain," there was an error which I feel should be corrected.

One picture showed a Forest Service crew spreading lime on Little Cub Lake in Forest County. The caption read, "the experiment failed." We beg your pardon, but the experiment was a complete success. We transformed a naturally acid bog lake, supporting only stunted bullheads, into a productive trout fishery. The project also had nothing to do with acid rain, since the bog lake was naturally acidic to begin with.

In 1979, when 6,000 pounds of lime was applied to the five-acre lake, the pH quickly jumped from five to 10, but then dropped to the pH seven range (neutral). The lake has stayed in the pH seven range ever since, with only one supplemental liming of 900 pounds in 1981.

In the past two seasons, Little Cub Lake attracted over 1,000 anglers who harvested an estimated 2,500 trout. Since the project had nothing to do with acid rain and trout were successfully established, it was a complete success—not a failure.

*TONY RINALDI, Biologist, Nicolet National Forest*

The nonpoint supplement in the May-June issue was fantastic. I know first hand of the damage erosion is doing to streams. My in-laws live in Carroll County, Illinois, so I've had the opportunity to fish several smallmouth bass streams in northwestern Illinois. The terrain is much like that of Grant and Lafayette counties across the border in Wisconsin—and so is the erosion and runoff.

The Apple River, which was perhaps the best smallmouth bass stream in this portion of Illinois 10-15 years ago, has been destroyed. No bass or other members of the sunfish family live in the stream today. Evidence points to pesticides and herbicides from the runoff as the culprit. In the Apple's case, only the sunfish family have been wiped out. Minnows and stocked trout remain. The pesticides appear to have been selective in their kill.

Other streams in the area have suffered as well. Seven years ago Carroll Creek had a decent smallmouth bass population. Today you would be hard-pressed to find one. All the gravel bars have been covered with silt and have grown over with weeds. I now sink six inches into mud in the middle of the stream on what was once a clean, bedrock bottom. Most of the drainage seemed to start around 1975.

I am personally appalled at this situation and will try to do something about it in my own way. I will send copies of the May-June issue to farming friends. I am quite sure that they really don't realize what they are doing to the rivers. I have a cousin who is a dairy farmer in Taylor County, Wisconsin. He will also get a copy.

I believe the solution to the problem lies in giving the farmer a good financial education on the economics of erosion. Today's society is "bottom-line" oriented, so the solution must be presented in bottom-line benefits.

If I owned a farm and was losing 20 tons of soil per acre I think I would be interested in knowing what that soil would cost to replace. I would also be interested in how a lost ton of soil increases my future costs, and how saving that ton of soil decreases them.

*MR. MICHAEL G. DOMRZALSKI,*
*Mount Prospect, IL*

I am the mother of a young man who drowned tragically in a canoeing accident in Racine County last May. He was a beautiful young man, full of love and laughter, who enjoyed life every minute. He had a lovely wife and a beautiful son.

In our hearts, we mourn the son whose love and laughter are lost to us forever.

I beg all boaters to remember this tragedy and use caution when boating. Wear life jackets and never, never stand up in a boat. Please think of your families and friends, those who love you and want you with them.

For John and those of us who loved him, it is too late. I am sure that time will heal this ache, but now we are consumed with grief. With our tears, in our sorrow, we ask that it not happen again to you or your loved ones.

*MRS. JILL GENEROTZKY, Oak Creek*

This picture shows a German brown trout that my dad, A. H. Skare, caught at Hixton in Jackson County in 1921. It weighed 12 1/2 pounds. Evidently, my dad didn't weigh too much more at the time.

We don't see many stream trout like this one nowdays. I thought it might interest you.

*"BUS" SKARE, Tomah*

Sometime during the last few years your Wisconsin Natural Resources magazine contained an interesting article about Wisconsin and the glaciers that had such an effect on geography and terrain. I would like to suggest the inclusion of more such articles.

In the past, man has taken things for granted simply because of lack of knowledge, but we are entering a new era in which science and its findings will make it possible for us to get a better grasp on why things are as they are and how they got that way. Please consider more articles about such things as the glaciers and their effect on topography, drainage, surface soils, terrain and mineral deposits.

*CLAUDE E. OLSON, Arkdale*

Your readers may want to know that they can obtain copies of the beautiful bluebird print in your May-June issue.

The Kalamazoo Nature Center will send an 11 1/2″ x 14″ full-color print signed by artist David Mohrhardt to those who contribute at least $20. These numbered, registered prints—limited to 550—help raise funds to continue our Eastern Bluebird Conservation Program.

Since 1972, the nature center has operated a bluebird nesting program which has produced more than 4,500 bluebird fledglings and 8,500 tree swallows.

*H. LEWIS BATTS, JR.,*
*Executive Director, Kalamazoo Nature Center*
*7000 N. Westnedge Avenue*
*Kalamazoo, MI 49007*

Your choice of illustrations could have been better in the article "Woodsmen, Spare that Tree."

I feel that the pictures of the red-tailed hawk and the laughing falcon were inappropriate. Red-tailed hawks seldom nest in dead trees and laughing falcons are seldom seen north of the Mexican border.

*CHARLES R. SINDELAR, Waukesha*

I was 95 in April, a farm girl here in the Township of Ft. Winnebago on the farm my grandfather "homesteaded" in 1848.

My parents were lovers of nature and my four brothers and I were taught to love and know and care for all the beauties for miles around, via buggy and horses. My mother was born in the log house that was built on that homestead and I have the deed to the 80 acres from the "Fox and Wis. Rivers Improvement Co.," the first tax receipt of $8.00 and an oil painting of the log house. It was there the Township of Ft. Winnebago was organized and the first officers elected. My parents lived and died in this home where I still live alone except for many friends. Some very dear younger folks here help me "paddle my own canoe." To show my appreciation to these two helpful families I would like two copies of your new book "Wisconsin's Endangered Flora." A check for $5.90 is enclosed. They love nature in all forms, and bring me roses and wild flowers that are like old friends but are never on the endangered list.

Thank you for helping me to be of influence and help to another generation.

*(MISS) LAURA M. M. ALTBEY, Portage*

As the author of "One Man DNR" in the July-August issue, I would appreciate it if you would put in a short correction. I incorrectly stated that Dennis Kirschbaum is the only person employed in Crawford County by the DNR. In fact, our forester, Ken Hujanen, has served for 14 years at Gay Mills and this year received the Bronze Hard Hat award for his outstanding work with tree farmers in the Crawford County area.

A bad error on my part and I apologize.

*DAVE WEITZ, Eau Claire*

I have just finished your new publication "Wisconsin's Endangered Flora." I want to commend you and DNR for production of an excellent publication.

It is well written, superbly illustrated and appealingly layed out. Most important, it supplies both nature professionals and citizens with the first reliable accumulation of useful information about the entire spectrum of rare and endangered plants in Wisconsin.

You have produced a very valuable tool with an unusually approachable format. In fact, our office copy has now been approached often enough that it is necessary for me to include a check for $14.75 and this request for five additional copies.

Thank you, and congratulations on a job well done.

*RUSSELL VAN HERIK, State Director, The Nature Conservancy, Madison*

**Front cover:** Jumping mallards. Watercolor by Artist Harold D. Roe, courtesy of the Leigh Yawkey Woodson Art Museum, Wausau and the Fenwick Gallery, Toledo, OH

Bird illustrations appearing on pages 4, 12 and 33 by artist Steve Ratcliffe, 2632 S. Stoughton Rd., Madison, WI 53716

**Back cover:** "Nice and bad out" by artist Virgil Beck, Box 66, Stevens Point, WI 54481

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# Egbert was a lucky duck

*FRED VAN DYKE, U-W Wildlife Research Student*

**Crippled ducks are pretty much a total loss, unless they're lucky like Egbert. A research project tells why. It also underlines the ethics of accurate shooting and use of a dog.**

The author releases a crippled mallard at Horicon Marsh. Only one, Egbert, recovered.

The last ducks and geese were returning to the Horicon National Wildlife Refuge as I packed my gear into the old station wagon to start home.

When I rounded the corner toward the refuge's southern gate, six mallards came toward me across an adjacent stubble field, flying low. Two blinds directly below them exploded as four hunters sprang into view. The lead mallard crumpled, crashing into the stubble not 30 yards from the near blind. The other five swung up and away in a single motion. But one fell behind. Its right wing drooped, obviously broken. Holding its good left wing erect, it began to spin down toward the marsh in ever shrinking circles, finally disappearing into the far cattails.

Another cripple! The sight underlined the importance of my research project. Some three or four million waterfowl are crippled each season and I wanted to find out just what happened to them. Do they recover, die, get eaten by predators, starve to death or what?

The first step was to capture some healthy, wild juvenile male mallards by rocket-netting. Juvenile males are the sex-age group most often killed by hunters and most often crippled. Research has found that because of inexperience, juveniles are more vulnerable to hunters than adults. They tend to be less wary and more easily drawn in by decoys.

I placed the captured mallards in a pen for two to three weeks where they could get used to wearing a radio backpack. Ducks take about that long to adjust to carrying a radio. Otherwise they behave very abnormally, lose weight and constantly pull and tug at the radio harness. Wearing a radio is so traumatic for a duck that if I had simply caught cripples and tied on a radio, and the bird later died, I wouldn't have been able to tell whether death was due to crippling or to the radio.

Once the mallards were accustomed to the radio, some were anesthetized and, under anesthesia, one wing was broken. The anesthetic prevented the duck from feeling pain. Of course, when the anesthetic wore off, it would. This may seem cruel, but it is the only way to investigate the life of crippled birds and get good results. An alternative would be not to investigate crippling at all. But that would mean never finding out what percentage recover or die, why, and if there's anything that can be done about it.

A broken wing is the most common crippling injury among mallards. It also made all the experimental cripples alike. Every cripple had to have the same kind of injury in order to compare the fates of different individuals.

On other ducks, I tied down a wing with a leather strap called a braille. The braille didn't hurt the mallard, but kept it from flying.

Both brailled and crippled radio-tagged mallards were released. This would determine whether mallards died or were killed simply because they couldn't fly (brailled mallards), or whether death was in some way related to the injury itself (crippled mallards). At the same time I also prepared some crippled and brailled mallards to keep in a pen at a nearby game farm. By comparing what happened to these "control" mallards with what happened to those released in the marsh, I would have a good idea of what role the environment plays in a crippled mallard's death or recovery.

I enlisted the help of the US Fish and Wildlife Service Disease Laboratory in Madison to autopsy dead ducks. They would tell me the condition of the bird, when it died and whether it had a disease.

The study ran two years, during the

autumns of 1977 and 1978. Altogether, about 135 mallards were involved. It would be confusing to look at each one separately. So let's look at a few representative individuals — four cripples in the marsh named Egbert, Dean, Witter and Merrill; one brailled mallard in the marsh named Lynch; and one cripple in the pen called Hobart.

Egbert was a cripple that recovered in the marsh. Egbert was a rare case. He was the only recovery among 34 cripples. Although special because he recovered, Egbert was otherwise a very ordinary crippled duck. He experienced the same weather and water levels, had to elude the same predators, used the same kinds of cover and ate the same foods as all the other cripples. But Egbert recovered and the others didn't. Egbert was lucky, and luck is not something a waterfowl manager can control. Egbert represents only 3% of all the cripples released. A 3% recovery rate would lower the estimated death rate by only 0.6%. In round numbers, that means an average of less than 30,000 mallards would recover each year. "Natural" cripples probably have an even lower recovery rate because they often have additional injuries. Mallards are much like other puddle ducks, and we would expect that these results would hold for black, pintail, gadwall, shoveler, widgeon and all ducks similar to the mallard. However, these results don't tell us anything about crippled diving ducks. It's very possible that crippled diving ducks have an even lower recovery rate than puddle ducks. A broken wing might limit a diver's feeding much more than it would limit a puddle duck.

Hobart was a cripple that recovered in the pen. Hobart was not a rare case, as Egbert was. Nine of the 40 (22%) cripples in the pen eventually regained the ability to fly. The pen was a kind of minimum-care "rest home" for crippled ducks. Advantages over the marsh were plenty of food, opportunities to rest quietly and no predators.

Neither crippled nor brailled mallards in the pen lost any weight during the study. But both crippled and brailled mallards in the marsh lost an average of 23% of their total body weight. Although there was no evidence of disease, weight loss was an important cause of death. Of 13 mallards examined, 12 were "thin" or "emaciated." Nine showed at least some wasting away of flight muscles in the breast. Nine had no abdominal or subcutaneous fat and eight showed losses of heart fat. Seven mallards in the marsh died directly from this weight loss. However, weight loss probably contributed indirectly to the deaths of most others killed by predators. Emaciated birds were so weak they had almost no chance of escaping. Weight loss and exposure combined to kill four mallards in 1977 after the marsh froze. Weight loss occurred because, as fall progressed, marsh food plants kept dying back. Healthy mallards adjust to this seasonal change by eating more corn, but crippled and brailled mallards couldn't get to it.

Penned cripples had to move around less than cripples in the marsh to get food. The less movement required to survive, the greater the chance a broken wing will mend properly. Penned cripples had only to walk a few yards across an open lawn to find food. Cripples in the marsh had to move constantly through heavy vegetation to find barely enough to eat. The constant bumping and jostling that the broken wing experienced as the duck moved through the thick vegetation led to many wing bones mending improperly. The break would heal, but in such a way that the broken wing was permanently shortened so the duck could never fly again.

Predation probably didn't affect the overall recovery rate very much, although predators may have removed a few individuals that would have otherwise recovered. The critical recovery period for a broken-winged mallard exists for two to three weeks after injury. Birds that don't recover by this time are unlikely to ever recover, because after this, improper mending usually destroys any chance to regain flight. Other studies have shown that almost all healing takes place within the first three weeks, and can occur as soon as six days after injury. Lucky Egbert recovered just 10 days after his injury. In 1977, only two of the first 14 cripples I released were killed by predators within three weeks of their injury. Egbert, however, was the only one of the remaining 12 to recover. In 1978, most predation occurred within three weeks after injury, so some potential recoveries may have been killed. However, the recovery rate in 1977, when predation was light, was so low that probably only one or two mallards in 1978 would have recovered, even if they had faced no predation at all.

Ultimately, a crippled mallard dies because it is unable to fly. We know this because the death rate for brailled mallards was the same as the death rate for crippled mallards. However, exactly when a cripple dies and what kills it is determined by where it finds shallow water to rest and feed. To understand how this works, let's look at four individual mallards.

Dean and Witter were released in the fall of 1977. That year water levels were low, and the shallow water feeding areas were located in the interior of the marsh. Upland fields and woodlots, traditional predator hang-outs were at least a quarter of a mile away through dense cattails or deep, open water. Not a single mallard was killed by a mammal predator (mink, raccoon or skunk) until the marsh froze. It's likely that mink and raccoon used the interior of the marsh, but apparently Dean, Witter and the other mallards were able to avoid them. Dean was one of five killed by hawks or owls before the marsh froze. Hawks and owls with easy access to the interior were the only successful predators before freezing.

Witter was killed by a mink in mid-November about three days after the marsh began to freeze. Most crippled and brailled mallards still alive at this time suffered a similar fate within the week at the hands of mink, raccoons or skunks. Freeze-up greatly increased predators' speed and convenience of movement into the marsh, but it had the opposite affect on ducks. A duck isn't strong enough to break even the thinnest ice, and its speed is much reduced when it has to walk instead of swim. After freeze-up predators found the table set with easy-to-catch crippled and brailled ducks.

Conditions were different in 1978 when Merrill and Lynch, crippled and brailled respectively, were released in the marsh. Water levels were high and the only shallow spots were near upland fields and woodlots. I released Merrill and Lynch, along with others in the interior as I had done with Dean and Witter the year before. However, in 1978 birds found water in the interior too deep for feeding. Almost immediately, radio signals from Merrill and Lynch showed them heading out in search of shallow water. Both stopped when they reached the edges of nearby fields and woodlots. Their behavior was typical. All my released mallards had left the marsh interior within four days and gone to shallow water at the edges of upland habitats. Five days after release, Lynch was killed by a raccoon. One week later I found Merrill with his throat slit by a mink. Almost all the released mallards in 1978 suffered similar fates within three weeks of release.

In general, the study shows that cripples are pretty much a total loss. Some are killed by predators. Others can't find enough to eat and starve. Still others last until a marsh freezes, then succumb to predation, starvation or exposure. A very few recover. But most winged birds will never rise again, which means the old truths about the duck hunt have more verity than ever. Remember:

Don't waste ducks!

Preseason practice at the trap range gives clean kills from the blind.

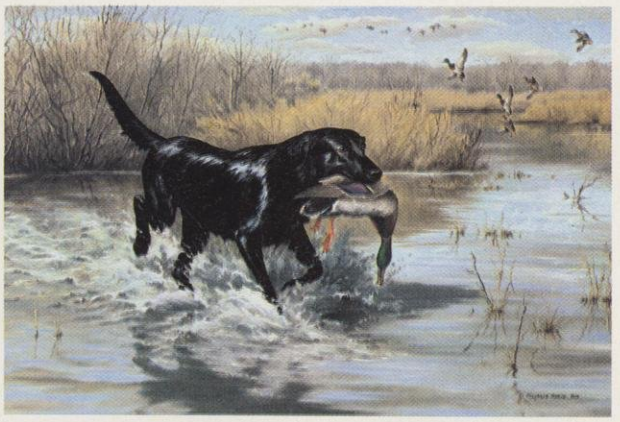
No skybusting!

And use a dog!

Every duck saved means more to hunt next season.

With geese aloft in the background, the author checks on surviving study ducks at day's end.

Wild ducks for the study were captured by baiting them close to a bank of rockets which, when fired, spread a net over the birds. **Photo by Rick Hunt**



Among the study findings: crippled ducks are almost a total waste. Every blind needs a well trained retriever to prevent it. **"Good Fetch" by Maynard Reece, courtesy of the artist and Mill Pond Press, 204 S. Nassau St., Venice, FL 33595**

Duck with radio attached. **Photo by Ron Gatti**

# Ducks Unlimited in Wisconsin

*JOHN WETZEL, DNR Migratory Bird Specialist, Madison*

**Without Ducks Unlimited, some three-fourths of the waterfowl that migrate through Wisconsin wouldn't.**

Flocks of migrating ducks darkening the sunrise on a crisp autumn morning. Graceful chevrons of geese silhouetted against the sky. Flights of mallards wheeling into a wind-swept marsh.

From the dawn of civilization to the eve of the 20th century, such sights were common-place. On color-spashed fall days, ducks and geese once blanketed the sky, winging south to their wintering grounds — pulled by the mysterious magnet of migratory instinct.

These seemingly endless flights were a legacy for us to enjoy, protect and hand down to following generations. Those who thrilled at the countless thousands never thought the skies would ever empty of ducks. Yet fantastic as the possibility seemed, within a few years the grim prospect came dangerously close to reality.

Shortly after World War I, people, industry and agriculture expanded westward across North America, swallowing the prairies of both Canada and the US. Before long, conservationists noticed a disturbing trend — the vast, sky-darkening flocks were rapidly disappearing. Waterfowl seemed on a downward plunge toward oblivion. Concern escalated to alarm that predicted the imminent death of our waterfowl heritage.

Amidst the gloom, a group called the "More Game Birds In America Foundation" was organized in 1929. It was the precursor of Ducks Unlimited. Searching for answers, the foundation launched an intensive study that lasted several years. It revealed that:

- More than 65% of North America's waterfowl begin life in three rich Canadian prairie provinces — Alberta, Saskatchewan and Manitoba.
- The irresistible onslaught of civilization, by draining and cultivating the prairies, was steadily ravishing these prime breeding grounds.
- Natural droughts and floods were critically limiting waterfowl production.

The study concluded that to restore duck and goose populations would require giant efforts to rehabilitate and preserve the nesting grounds in Canada.

The More Game Birds in America Foundation disbanded in 1937. But before it did so, the foundation donated its assets and some of its key leaders to a new group just then forming. Out of the drought years of the '30s, Ducks Unlimited (DU) was born.

Since then, the organization has become one of America's most-successful, non-profit conservation organizations, focusing on preserving wetland wildlife-breeding habitat in Canada. The organization has raised more than $140 million, with an average of 80 cents of every dollar going directly to preserve habitat. The group's efforts have saved three million acres of Canadian wetlands where 70% of North America's waterfowl hatch. Their long-range goal is to preserve at least six-million acres of such wetland breeding areas. By 1987, DU's golden anniversary year, the aim is to have 1-1/2 million members generating $100 million annually toward this goal.

In 1980 and '81, when severe drought — dry as the dust-bowl 30's — again hit the prairie-potholes of west-central Canada, the average number of ducks per pond dropped as much as 50%. But most DU projects held water and produced birds. In some areas, the organization's lands provided up to 95% of the breeding habitat available.

Ducks Unlimited owes much of its success to local volunteers who organize and conduct annual fund-raising dinners in their areas. First begun on a regular basis nationwide in 1966, these annual events have become the financial backbone of the organization. Of all the money ever raised in the group's 45-year history, 85% has been generated in the last decade alone, thanks to the local dinners. Two-thirds of this lifetime total has been raised in just the last five years.

Inside the US, federal, state and private agencies spend $100 million annually on waterfowl habitat but only $25 million is spent in Canada - and most of that is generated through Ducks Unlimited.

DU is important to Wisconsin. Of the estimated four to five million waterfowl passing through the state each fall, an estimated 80% come from Canada. Even though Wisconsin produces some mallards, blue-winged teal and wood ducks, most mallards and teal taken here are hatched north of the border. Of other waterfowl — bluebills, ringnecks, wigeon, pintail, geese and coot — few are hatched here.


Chances are, many of the mallards that drop into Wisconsin marshes this fall got their start on Ducks Unlimited flowages in Canada. **"Early Arrivals — Mallards" by artist David A. Maass, courtesy of Wild Wings, Lake City, MN 55041**

## Wisconsin pitches in

Wisconsin is a strong supporter of Ducks Unlimited, consistently one of the top 10 contributor states over the past half-decade.

Growth of the state Duck's Unlimited organization has paralleled that of the national group. In 1966, 1,700 state Duck's Unlimited members raised only $32,000, but it was a watershed year, nonetheless. From beginnings then, state membership grew 16-fold until 1980, when Wisconsin's contribution exceeded $1.5 million. Still another 21% increase in 1981 saw this total approach nearly $1.9 million in contributions from nearly 33,000 members in 118 chapters across the state.

The State of Wisconsin has assisted Duck's Unlimited by contributing to work carried out on five Canadian projects.

Between 1967 and 1978, a total of $100,000 was donated for Badger State projects from $1 contributed for every nonresident small game hunting license sold.

Ducks Unlimited got another boost in 1978, with inauguration of a state waterfowl stamp. One-third of the duck stamp revenue is set aside by law "for the development of waterfowl propagation areas within Canada."

# Wisconsin's Ducks Unlimited Projects

### Nestle Duck Factory

Nestle is approximately 345 air-miles north-northwest of Winnipeg or approximately 20 air miles northwest of the town of The Pas, Manitoba. Sedge and softstem bullrush dominate the Nestle's 65 miles of shoreline. A 1,000-foot inlet supply ditch and control structure maintain proper water levels. A wide range of diving and puddle ducks use the 1,757-acre area.

### Eagles Lake

This project is located in Saskatchewan about 300 miles northwest of the city of Regina or 25 miles east of the town of Meadow Lake. Its chain of four lakes total 13.1 miles of shoreline and 1,021 flooded acres. Ditches connect the lakes and control devices maintain water levels. Unlike most other Ducks Unlimited projects, Eagles Lake lies just outside the prairie-pothole region, approximately 25 miles north into a northern boreal-forest area. Nonetheless, it produces substantial numbers of mallards, blue-winged teal, widgeon, bluebills, redheads and canvasbacks.

### Last Mountain Lake

This unique area is located in Saskatchewan, 75 miles northwest of Regina. It floods 1,174.5 acres with 26.6 miles of shoreline. Within the project are five basins, created by five dams with interconnecting channels, ditches and water level controls. A cooperative venture with the Canadian Wildlife Service and the Saskatchewan Department of Natural Resources, the diversified nesting cover here attracts many different ducks.

### The Summerberry Marshes (Under Construction)

Summerberry Marshes is the largest of Wisconsin's five projects, encompassing some 37,000 acres in a series of 38 shallow lakes. In 1979, Wisconsin agreed to help Ducks Unlimited and the province of Manitoba develop and restore this area. To date, Wisconsin has contributed almost $460,000 in duck stamp revenues toward the project's more than $2.2 million total cost. This rich marsh complex lost much of its productive potential when generating stations and hydroelectric reservoirs disturbed the natural flood-and-drought cycle. Many upstream lakes were left almost dry, while the downstream lakes frequently flooded and disrupted natural vegetation growth.

When the normal flood-drought cycle is restored, healthy stands of bulrushes, cattails, pigweed, horsetails and sedges will again grow in the basin. Once reflooded, a great store of nutrients will be released, triggering subsequent growth of both above-and-below water plants and restoring the area as productive duck breeding habitat. Summerberry's separate units will each have independent water-level controls, protecting them from flooding during critical periods, while still allowing for artificial drawdowns if need be. Man-made nesting islands and level ditches will overcome nest cover shortages.

Droughts on these northern wetlands are neither as long nor as dry as on the prairies further south. When completed sometime this year, Summerberry will produce over 10,000 ducklings annually, besides serving as a fertile back-up nesting area when drought hits the central prairies. Other species will also benefit from the restoration, including grebes, herons, gulls, terns, blackbirds, hawks, muskrats, beaver, wolves and moose.

### Red Earth

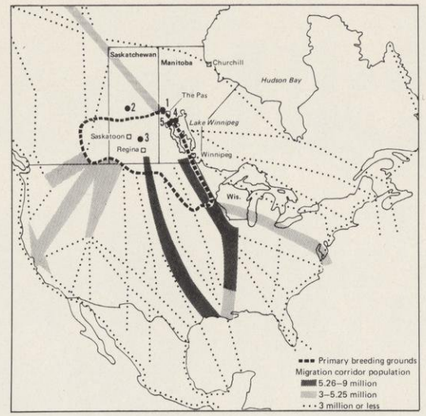
Located 21 miles southeast of The Pas, Manitoba, water for this project is pumped from the nearby Saskatchewan River. Much of its 27,500-acre area is open water. Its 115 miles of shoreline are bordered with cattail, sedge, grassy meadows and bog birch. There are also 9,000 acres of upland. Red Earth Lake attracts bluebills, ringnecks, mallards, blue-winged teal, and Canada geese for nesting. It also acts as a fall staging area for lesser bluebills, Canada geese and whistling swans. Muskrats and moose are found throughout the area.

Photos:

Far left: Only about a quarter of North America's ducks are "locals" like these. The rest are hatched in Canada's prairie pothole region. **Photo by Staber Reese**

Center: One-third of Wisconsin's waterfowl stamp revenue is earmarked for Ducks Unlimited projects in Canada. The dollars go a long way toward assuring continued good hunting here. **Photo by Ken Wardius**

Bottom: Careful management on Last Mountain Lake and other Ducks Unlimited Canadian holdings assure plenty of water for breeding when drought and drainage strike elsewhere. **DU photo**




### DU ducks travel Wisconsin flyways

Badger State Projects
1. Nestle Duck Factory
2. Eagles Lake
3. Last Mountain Lake
4. Red Earth
5. Summerberry Marshes

### DNR Contributions to Ducks Unlimited

1968-1978: $180,043*
1979: $130,638**
1980: $109,660
1981: $116,228
1982: $102,000 (projected)

*1968-1978: $1 from each nonresident small game license sold.

**1979-1982: One-third of Wisconsin's Waterfowl Stamp Revenues.

### Growth in Wisconsin

| | 1966 | 1970 | 1975 | 1980 | 1981 |
|---|---|---|---|---|---|
| Dollars | $32,437 | $118,003 | $386,185 | $1,554,978 | $1,879,255 |
| Chapters | ? | 14 | 31 | 86 | 108 |
| Members | 1,732 | 4,484 | 13,144 | 28,224 | 32,506 |

### Founding of Wisconsin DU Chapters

**1971**

Appleton/Neenah
Eau Claire
Green Bay
Janesville
La Crosse
Madison
Milwaukee
Oshkosh
Rhinelander
Superior
Waukesha
Wausau
West Bend
Wisconsin Rapids

**1972-1976**

Antigo
Arcadia
Ashland
Baraboo/Dells
Burlington
Eagle River
Fond du Lac
Fort Atkinson
Horicon
Kewaunee
Manitowoc
Marinette
Monroe
Neillsville
Prairie du Chien
Racine
Rice Lake
Richland Center
Ripon
Shawano
Sheboygan
Stevens Point
Tomah
Waupaca

**1977-1979**

Adams/Friendship
Bangor
Beaver Dam
Black River Falls
Brookfield/Elm Grove
Ellsworth
Hayward
Kenosha
Ladysmith
Marshfield
Menomonee Falls
Mequon
Merrill
South Milwaukee
Minocqua
Montello
Mosinee
New Holstein
New London
Oconto
Platteville

**1977-1979** continued

Rochester
Sauk City
Stoddard
Sturgeon Bay
Tomahawk
Viroqua
Watertown
Wautoma
Webster

**1980-81**

Alma
Amery
Baldwin
Cecil
Chippewa Falls
Clintonville
Columbus
Crandon
Edgerton
Elkhorn
Grantsburg
Holmen
Hudson
Kaukauna
Mauston
Menomonie
Mercer
Middleton
Muskego
Oconomowoc
Beloit
Brillion
Campbellsport
Osceola
Phillips/Park Falls
Portage
Port Washington
Poynette
Princeton
Schofield
Sister Bay
Slinger/Hartford
Sparta
Spooner
Suamico
Taycheedah
Three Lakes
Union Grove
Wittenberg

**1982 to date**

Amherst
Barron
Durand
Kellner
Pittsville
Plainfield
St. Croix Falls
St. Germain
Sun Prairie
Two Rivers
West Allis

# Bluebill morning

*DON BRONK, Wausau*


**In days gone by, when men were men and journalists wrote compulsively about anything, there was honor among sportsmen and an honest division of labor between Duck Hunting Guide and Intrepid Client, especially if the client were a journalist. Not any more, I tell you. Nowadays, Noble Guide is not only expected to reconnoiter all potential duck hunting areas; locate and secure the best site; construct the blind; provide boat, motor and decoys; transport Journalist to the blind; determine hunting strategy; supervise decoy placement; provide coffee and intelligent conversation and/or doughnuts; identify ducks by land, sea and air, close or far, still or flying, light or dark, clear or fog; provide incidental lessons in natural history; control shooting activity (Hah!); serve as game law legal counsel; nail cripples; chase unnailed cripples all over the lake; retrieve bagged ducks; provide information on cleaning and cooking; be an emergency gunsmith, psychiatrist, boat captain and dead-of-night navigator; know first aid and safety precautions; forecast weather and even shoot most of the birds. Besides all this...the poor overworked Guide now has to do the writing too. What follows is how it was. Honest!**

"No, no," I whispered urgently at the top of my voice. "No, no. Don't shoot."

Out of the windswept shadows of the early morning, a herring gull slid gently from the sky and settled cozily into the outside decoys.

"God," the Journalist intoned, lowering his reblued and refinished Browning Auto-Five. A drop of clear liquid formed on his forehead and hung there. Trembling with suppressed excitement, he shook it off. It landed on my sandwich.

"Gulls get to me," he continued. "That beauty, that grace in motion—that gets to me." He had the journalist's flair for a turn of phrase.

"How come you pointed your magnificient weapon at all that 'beauty and grace'" I snapped.

Absent-mindedly, he rubbed his lemon-oil finished stock.

The gull, its tail high, swam in and out of the outermost redhead decoys. It looked calm. I wished I felt so calm. I was hunting with one of the hottest gunners this side of Arkansas, one of those that make biologists nervous when they set flyway bag limits. And I was supposed to be calm!

I took a deep breath, and settled back against my boat seat so that only my soft brown eyes peered out of the blind. To settle my nerves, I dispassionately reviewed the facts:

My name: Don Bronk, licensed waterfowl hunter and unlicensed waterfowl guide.

My partner: A Journalist, licensed waterfowl hunter and unlicensed sports editor.

My partner's gun: A re-blued, refinished, re-tooled, re-bored, re-polished, inlaid, engraved Browning Autoloader touched by nothing except whale, tung, lemon and mineral oils. The kind of gun that gives you a sensation just to touch.

My gun: Also a Browning, but worn, scratched, stained and dirty. Misses a lot. No sensation. Just something to tote.

The date: I'm vague on this. It was October, I'm sure.

The place: I'm not telling.

The time: Shortly after shooting opened, i.e., lunch time.

The Journalist reluctantly settled back and I diverted my attention to the defiled sandwich. Theoretically, I could eat, knowing that this Doc Holliday of duck hunting was keeping watch, his jewelry-finished fowling-piece poised like a blue cobra, ready to strike. No sir, I didn't have to worry about shooting anything, unless maybe 10 or more ducks flew over. Then, possibly, I would get a shot—if he left any.

The fresh peanut butter sandwich sat there on the edge of the blind. Contemplating it and the recently bestowed droplet that had now been absorbed into the bread, I got to musing about the virtues of hunger appeasement versus delicacy. Or, maybe a drop of sweat from a journalist is so rare, it's something to be savored.

At a French cafe, an elegant Italian pizzeria, a German schnitzelshop or even a taco stand, the course of action would be clear: Call the waitress and point to the wastebasket. But out here in the swamp primeval, the code of conduct was different. Hunger could strike at any moment, and who knew when the next meal could be wrested from the hostile environment?

Meantime, the Journalist went into his monologue—the sermon on how tough it is in the newspaper business, and how he would drop it in a second if it weren't for the romance and good pay.

The monologue triggered some old associations for me too. I waited for him to catch his breath (about 19 minutes)

then launched into my own lecture, touching on my wide variety of interests: Life, death, women, ducks, philosophy, the universe, decoys, food, women, science, waterfowl, wine, classical music, sex and women.

I talked desperately, trying to wrench my mind free from thoughts of that sandwich, which sat there on the edge of the blind, gathering frost and seed fuzzies from the marsh hay in the camouflage. I was hungry, achingly hungry, and that sandwich had a one-way ticket for a trip down my alimentary canal. Maybe if I continued talking I would forget it. Remorselessly, I talked.

Finally, I had to pause for air. I announced my intention with the usual "Well, what do you think?" (As if I really cared.)

"There's three ducks in the decoys," he answered blandly. Just like that, he said it. No emotion, no inflection, no color or excitement, just: "There's three ducks in the decoys."

Well, big lumpin' deal! If he thought he could rattle me with an announcement like that, he was out of his gourd. I ignored him and continued brushing the seeds and spiders off my sandwich.

Getting no response, he twisted the blade: "They must have flown in from your side." Journalists have a knack for making unsupported accusations sound like gospel.

"They came in on my blind spot," I retorted with experienced dignity. "I was checking the motor, loading my gun, winding my watch and tying my shoe."

"What are they?" he whispered. The fake calm in his voice didn't fool me. I heard his safety click off, and the polished barrel of his autoloader rolled slowly forward like the starboard cannon of a man-of-war.

"Mud hens," I snapped, reaching for my binoculars. The Journalist froze. I didn't actually know what the birds were in the gloomy light, but I knew I'd never get a shot unless I stopped him fast. Fortunately, the expression "mud hens" paralyzes experienced duck hunters like a karate chop to the neck (mud hens properly prepared, are said to taste like sun-ripened carp entrails. Improperly prepared mud hens taste no different).

I glassed the spread and quickly picked up the ducks. They closely resembled my hand-made decoys, but were somewhat less realistic.

"Bluebills," I said, lowering the glasses. "You take the two on the right, and I'll take the one on the left." I wasn't being generous. Occupying him with two was my only chance for getting one.

All I remember about what happened next is that I shot, and that my deceased target got up and flew with amazing alacrity. Taking aim again, I led the heroic little fella by a foot, but there was a sudden blast, and the bird's potential roastability was actualized, as they say on Madison Avenue. Then there was a third blast, and Jonathan Livingston Seagull, who had been romancing the decoys all morning, flew off with an obscene squawk.

As for me, I didn't shoot anything. Oh, I'd aimed the gun and led the duck and all that, but I didn't shoot it. I wasn't near fast enough. The Journalist got "his" two birds with one shot, "my" duck with his second shot, and fired off the third shot for sheer exuberance. The "sheer exuberance" flew away, still squawking.

"Hard to stop shooting once you're started," he laughed.

We motored out of the blind to pick up the three entrees. When we got back, I broke! A man can take so much! To have three ducks deliberately sneak into the decoys (on my blind side) and swim about arrogantly, giving me the bird; to have an utterly dispatched target spitefully get up and fly away; to have your partner bag an entire flock with two shots...Well, I'm not ashamed of my actions. I just reached right over, and without compunction or remorse bared my fangs, grabbed that sandwich and tore out its jugular like a cougar on a corn-fed heifer. Ate the whole thing, liquid condiment and all. Washed it down with a steaming cup of Old Three O'Clock, that magic coffee brewed in the dead of night and guaranteed to activate anything from a frozen hunter to an embalmed pharaoh. Wiped off my face on my sleeve, and felt fit again—ready to survive another hour with Hawkeye and his magic thunderstick.

Restored to my usual magnanimity, I turned to congratulate the Journalist on his shooting.

He was gone! Now I've lost ducks and I've lost decoys. I've lost my way and lost track of time. I've lost my money and lost my temper, but I never lost a partner. So I ducked my head under the blind, and there he was. He was down there, performing his "Secret Cocoa Ritual."

I should explain that my blind, christened "Leviathan"—is a floating, pontoon-mounted affair into which my boat fits. The whole thing is thatched with grass, and has a roof with three holes cut in it, out of which we hunters generally protrude. The Journalist had simply pulled back into his hole like a hermit crab. He was on his knees on the bottom of the boat, reverently making his mysterious, ritual hot chocolate.

Using the boat seat as an impromptu tabernacle and muttering piously, he mixed brown powders, eye of newt and owlets wing with boiling water in a little plastic crucible and jiggled all with a spoon like some 20th-century Merlin. Strong men would shudder with disbelief at the look on his face while conjuring cocoa—the mesmerized focus of dilated eyes, the beatific smile, the monomaniac concentration of psychic power sparking from his beard. One didn't know whether to offer him marshmallows or an exorcist.

Immunized by three years of hunting with him, I tore my eyes away. Somebody had to stand guard while he was magicking his drink, or an attack-flock of waterfowl would sure as heck Pearl-Harbor our decoy spread while we were still mopping mayonnaise off our faces.

It's a well-known fact that ducks have a mystical knack for divining exactly when duck hunters are taking a snack. It's then that they fly short, cardiac-arrest sorties over the blind to look down and actually see, close-up, boiling coffee being poured on unprotected knees and sandwiches being dropped from nerveless fingers into the filth in the bottom of the boat.

I scanned the horizon, after a double-check of the decoys to make sure no sneakers had submarined in.

Whup! My vigilance paid off! Banking out of the dark shoreline on silent, arched wings, a lunch squadron of about eight bluebills lowered flaps for a torpedo run on the center decoys. I raised my gun. Then, in a moment of malicious hysteria, I bit back my warning

until the birds were over the decoys and settling.

"Ducks!!" I screamed, leaping to my feet and firing. A bird dropped.

Swiftly I led on another, but an explosion of racket from under the blind threw me off and I missed. The Journalist was trying to cork his thermos, set it to one side, secure his cocoa, dispose of his spoon, find his gun, find his shells, find the ducks, get to his feet and fire, all in one smooth motion. He sounded like a raccoon climbing a cut-glass chandelier.

The flock peeled away, but one bird was on the inside edge and still in range. A straight-away shot—I drew a bead just as the journalist popped out like a squirrel disturbed by a chain saw. He was armed and dangerous. We fired at the same instant—and that poor waterfowl, impinged upon by two loads of shot and a half-cup of vaporized cocoa, surrendered the spirit.

We were motoring back to the landing, calling it a day with a shy but satisfactory bag of five bluebills stretched out on the front seat.

"Are you going to use the Hemingway style?" I shouted over the noise of the motor.

"Huh?" he replied. He's the only man I know who can snooze in a speeding motorboat, sitting upright.

"When you write this trip up," I asked, "will you use the Hemingway style? You know—'The Old Man and the Lake, Ducks in the Afternoon, The Gun also Rises'."..

"Huh?" he said again.

Well, he was listening, anyhow.

I continued: "Or will you write this up like Aldo Leopold—heavy on the reminiscence and poetics, with a gentle regret for the hunting element coupled with startling insights on the salvation of the environment and..."

"I'm not going to write this up at all," the Journalist said. He started to laugh. "Nobody would believe it."

I shut right up. He has a mind you can't change.

But deep down I knew the story had to be told. It had been a heroic day—especially on my part. When I got home, I hurried more than usual to secure gear and clean birds and gun. Then, when all was done, I uncovered the trusty Smith-Corona. Fresh peanut-butter sandwich in hand I began to write, and this is the result—and the end.

Maybe I should have stopped sooner!

# A Murmuration

Bunches of birds often have beautifully descriptive names. Most of the words are archaic, fallen into disuse as our early, rural English-language heritage moved away from Britain and the world became more citified. We are not so intimate with bird words anymore. But here are a few for bunches of birds that, archaic or not, still roll happily off the tongue:

Bevy of quail
Bouquet of pheasants
Bunch of teal or widgeon

Charm of finches
Chattering of starlings
Chevron of geese
Congregation of plover
Convocation of eagles
Covert of coots
Covey of partridge

Deceit of lapwings
Descent of woodpeckers

Exaltation of larks

Gaggle of geese
Gang of ducks

Herd of curlews or wrens

Knot of widgeons

Murder of crows
Murmuration of starlings
Mutation of thrush

Ostentation of peacocks

Pack of ducks
Party of ducks
Pitying of turtle doves
Plump of grouse
Puddling of mallards

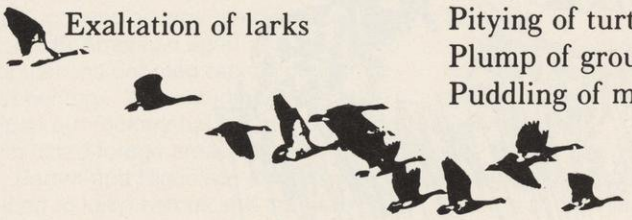
Raft of ducks

Siege of herons or bitterns
Skein of geese (airborne)
Sord of mallards
Spring of teal (on water)
Staring of owls
String of geese (airborne)

Tidings of magpies
Trip of widgeon

Unkindness of ravens

Walk of snipe (on the ground)
Wedge of swans (airborne)
Whisp of snipe (in the air)
Watch of nightingales



# Where do all the birds go— —and why?

*SCOTT CRAVEN, UW-Extension Wildlife Specialist*

**Bird migration has fascinated people ever since they first observed it. In Wisconsin, more than 200 species migrate. The why and how of it trickles in as science learns more. The fascination remains.**

Robins fly south in winter. Every child knows that. Many other birds go south too. But where, exactly, is "south"? For some northern Wisconsin birds the Madison area is "south." For some Madison area birds "south" means all the way to South America! Why and how do they make that strenuous round trip?

A few thousand years ago what every child now knows was certainly not common knowledge. Humans first noted the comings and goings of birds about 1000 B.C. The Greek philosopher Aristotle was one of the first to write about it some 2,400 years ago. Although he thought some birds moved from place to place, he also believed that swallows hibernated in hollow trees, caves and the mud of marshes. Aristotle also wrote of transmutation: how one bird turned into another kind of bird for the winter and then transformed back to its original form in spring. Other early ornithologists proposed that birds flew to the moon for the winter and that small ones hitched rides on the backs of storks or cranes and other larger birds.


Endangered peregrine falcons migrate all the way to South America each winter. Unfortunately, they continue to absorb eggshell-thinning DDT still used there. **Painting by Roger Tory Peterson, courtesy of the artist and Mill Pond Press, 204 S. Nassau St., Venice, FL 33595**

Modern research techniques — radar, radio telemetry and banding — have answered many questions about bird migration. How fast? How far? When? Where? We now know most answers. The major remaining question is the how: how do birds navigate with such precision over such long distances? Theories and partial explanations are abundant: visual cues, hearing, celestial navigation, a sun compass, a magnetic compass based on the mineral magnetite, learning and experience. A complete explanation of the "how" is somewhere down the scientific road. But the fact remains that birds do migrate from a northern summer home to a southern winter resort and back and forth for the life of the bird. For some long-lived birds the round trip may be made 15 to 20 times or more.

Why do they do it? Why do perhaps two-thirds or more of Wisconsin's 332 species pack up and leave while perhaps 100 others stay behind to endure the rigors of Wisconsin winter. Many that leave could withstand winter's cold and snow if they could find adequate food. However, winter freezes ground and water, kills insects or forces them into hiding and covers everything with snow. This makes food unavailable to those that depend on insects, worms or living plants. Thus, they move to warmer climates where food is plentiful, leaving behind woodpeckers, jays, juncos and cardinals to forage for dormant insects or seeds and of course, handouts from benevolent humans. Seed-eaters are decidedly less migratory than insect-eaters.

If life is so easy in the south, once our Wisconsin birds get there, why don't they remain all year? In spring and summer Wisconsin becomes more attractive than a Florida resort. There

are longer days for breeding and raising a family the further north a bird travels. If all migrants were to remain in the south, the competition with each other and with resident birds would be intolerable. Estimates place the number of breeding birds in North America at 7,600 million. They certainly need to spread out a little. Also, there are rich food supplies to exploit — all those earthworms for example, waiting for the robins.

Some theorists say that for perching birds migration evolved in the tropics. They point out that however social-minded a bird may be during most of the year, it does not enjoy close communion with members of its kind, other than its mate, during the breeding season. Probably because reproduction led to much overcrowding, individuals spread outward from their places of origin as the breeding season approached, but returned to their ancestral home for the rest of the year. Thus, the migratory habit may have become established and inherent in the species and ever-expanding breeding ranges eventually brought many of them into the United States and Canada. But only a small minority have altered the habit of returning to their more tropical place of origin for the winter. Although those that leave may truly benefit by escaping severe winter weather, they may not be driven south by such weather since many are already on the move by late July and August.

Huge, mixed flocks of blackbirds, starlings, grackles and cowbirds are just about everywhere this time of year, and many farmers know them (just as they know the season's large flocks of crows) as regular pests in cornfields.

These flocks may each include millions of birds when they finally reach their wintering areas farther south in the Mississippi Valley. Some have been estimated to contain as many as 15-million birds. They cause regular property damage and health hazards, breaking the branches off trees with their combined weight and fouling whole communities with their guano. Wisconsin can count itself lucky to escape with only some crop damage.

Flocking behavior is as varied as migration. Birds flock for protection against predators, to search for food, to group in a family, to stay warm, to care for young and to breed.

In general, there is some sort of coordinated behavior in flocks. For example, in cold weather small birds, such as wrens and kinglets, sometimes gather together for slumber parties and spend the night sleeping in a feathery ball. Some common diving ducks and coots group by the hundreds to spend cold nights as compact, living rafts on lakes or rivers. And chimney swifts, true to their name, may cling by the thousands to the inside walls of a single large chimney for the night, after a hard day's migration.

Aristotle believed birds that disappeared in the fall did so because they changed into other birds. It's easy to see how he might think so of the gaudy goldfinch, which becomes drab indeed during winter. **Photo by Gregg Scott**

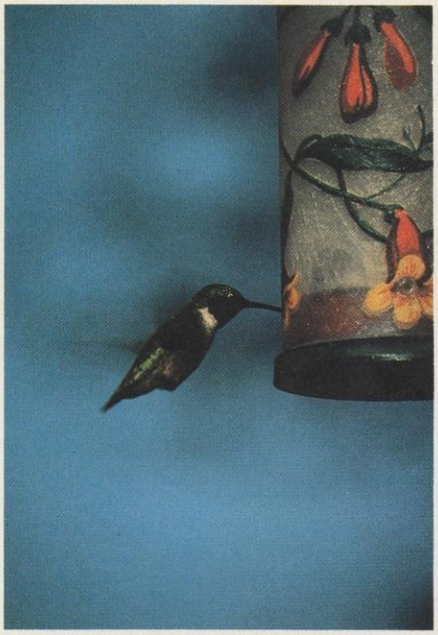
Redwing blackbirds sometimes seem to occupy every cattail and fencepost when they migrate here in spring. But concentrations in Wisconsin are nothing like on the wintering grounds down south, where they can befoul whole communities and break branches from trees with their combined weight. **Photo by Steve Lang**

Among the first birds to leave Wisconsin in fall are the insect-eating warblers, flycatchers and swallows. Most owls, woodpeckers, jays, chickadees, cardinals, starlings, crows and pigeons stay all year. The first to leave are not necessarily first to return. Wisconsin's first spring migrants include the kestrel (sparrow hawk), robin, Canada goose, killdeer and redwing blackbird. When male redwings return to set up nesting territories and await their females, it's a sure sign of spring.

Some birds from Canada may winter in Wisconsin: the snowy owl, rough-legged hawk, goose and snow bunting, for example. Some northern Wisconsin nesting birds drop down into the southern part of the state where they provide lots of color at winter feeders. Among these visitors are the evening grosbeak, purple finch, crossbills, hermit thrush and juncos.

It's important to remember that the winter whereabouts of a species is very general. A few individuals may turn up a long way from most of their relatives or not migrate at all. Thus a few robins always spend the winter in the University Arboretum in Madison, snowy owls may or may not visit Wisconsin each year, and while most waterfowl leave Wisconsin at freeze-up, a few ducks and geese seem content to remain on any open water they can find.

Migration is not a strictly north-south proposition and may or may not involve great distance. The Arctic tern makes the longest known migration flight of any species. Nesting near the Arctic Circle and wintering on islands near Antarctica, the tern makes an annual roundtrip flight of about 25,000 miles. The whistling swans we see in fall are east-bound for the Chesapeake Bay. Wisconsin's barn



When tiny ruby-throated hummingbirds fly across the Gulf of Mexico, they use only about a penny's weight of body fat for the 500-mile crossing. **Photo by Ken Wardius**

Whistling swans that migrate through Wisconsin raise their young near the Arctic Circle, in Alaska and western Canada. By the time they get here, they're heading almost straight east, toward Chesapeake Bay. **Family of Swans by artist Gary Moss, courtesy of Wild Wings, Lake City, MN 55041**

swallows head south all the way to Brazil and Argentina.Woodcock head for the Gulf Coast, especially Louisiana, while coots seem to scatter to the four winds. Great blue herons and robins visit the southern half to two-thirds of the United States. The pied-billed grebe winters in the southeastern United States and Mexico while the black tern continues on into South America. Northern Wisconsin's bald eagles scatter out along the Wisconsin and Mississippi rivers. The various hawks passing through Wisconsin often follow distinct corridors such as the Duluth highlands or the Lake Michigan shoreline where updrafts aid their soaring flight.

Much of our information on where birds spend the winter and the routes they use to get there comes from banding. Many thousands of birds of all kinds are banded each year by professionals and amateurs alike. When a banded bird is caught, or found dead, the finder reports the numbers on its tiny metal leg-band (called rings in Europe) and the bander is notified that one of his birds has been recovered. These "recoveries" tell us much about a bird's seasonal whereabouts.

Many band recoveries come from ducks and geese, both because there are so many banded and because ducks and geese are shot by hunters who discover the bands. Recoveries from our tiny songbirds are much less common and each recovery is a real thrill for an amateur bander. Gary Zimmer of Laona is such a bander. He has had several interesting recoveries. For example, a male purple finch, originally banded in eastern Oklahoma in 1975, was recently recaptured near Laona. One unlucky pine siskin, banded near Antigo on its northward migration, was recaptured only five days later near Laona. Two chickadees have returned for five consecutive winters to the feeders at the Zimmer home. Also, a tree swallow, banded in 1977, raised young in the same bird house for three years.

Another bird bander, Mrs. Edna Koenig of Sauk City, began banding in 1961. During an "invasion" of evening grosbeaks in the winter of 1961-62, she and her husband banded 1,302 of them—62 in one day. Forty of the grosbeaks already wore bands including one from New Hampshire that had been banded eight years before the Koenigs captured it. Others had visited Minnesota, Ontario, Virginia and all of the New England states.

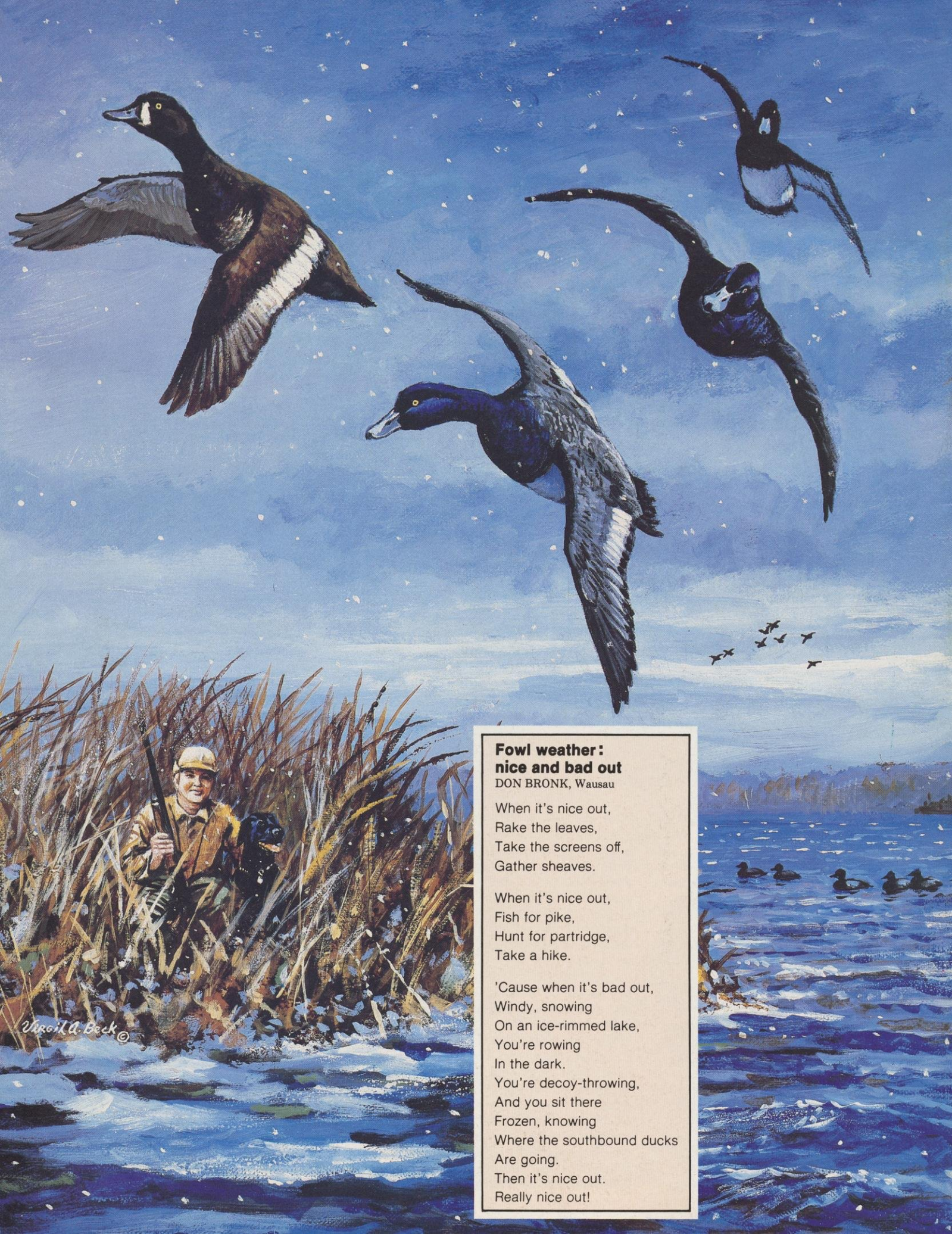
On another occasion, a captured grosbeak had been banded by a woman in Pennsylvania who had just reported capturing one the Koenigs banded in Sauk City. Mrs. Koenig also captured hundreds of purple finches which continued to return to her feeders day after day despite the experience of being captured and handled.

Migration is not an easy proposition for all these tiny birds flying to such exotic places. Besides the tremendous amount of energy it takes, a bird faces many perils along the way. Larger birds are sometimes killed by hail or lighining. Waterfowl are hunted. A bird away from its home territory is a more likely predator victim. Tall buildings, lighthouses and TV towers are very dangerous, especially in bad weather. Birds seem to be attracted or confused by bright lights at night, and often crash into towers or support wires. Tall towers near Eau Claire are famous for claiming the lives of hundreds of migrants each year.

Migration can be dangerous for people as well as birds and collisions with airplanes are not uncommon. Sixty people died when an airliner struck a flock of starlings in Boston in 1960. A duck that weighs four pounds, if hit by a plane going 600 mph exerts an amazing force of 57 tons! And snow geese have astonished pilots who found them at an altitude of 20,000 feet.

Wouldn't you expect a small bird to tire out or even die of exhaustion during such a trip? Apparently this is very rare. A tiny ruby-throated hummingbird that weighs only four grams (a little more than a penny) uses only one gram of fat (fuel) to make the 500 mile crossing of the Gulf of Mexico. The golden plover crosses 2,400 miles of the Atlantic Ocean in 48 hours on just two ounces of body fat. That's about eight times as fuel efficient as a small airplane!

Do what you can do to assist your neighborhood birds with plantings, nestboxes or feeding and they will continue to fascinate you with their seasonal disappearing acts.




**Fowl weather: nice and bad out**

DON BRONK, Wausau

When it's nice out,
Rake the leaves,
Take the screens off,
Gather sheaves.

When it's nice out,
Fish for pike,
Hunt for partridge,
Take a hike.

'Cause when it's bad out,
Windy, snowing
On an ice-rimmed lake,
You're rowing
In the dark.
You're decoy-throwing,
And you sit there
Frozen, knowing
Where the southbound ducks
Are going.
Then it's nice out.
Really nice out!