Retooling Minnesota's

TOP PHOTOGRAPH: CYRUS MINNESOTA AREA BY JAMES AND MELISSA PETERSON,
BOTTOM PHOTOGRAPHS: GREEN-WINGED TEAL BY BILL MARCHEL

Duck Factory

The DNR and its long-term duck plan are aiming to make western Minnesota prime habitat for breeding ducks.

By Michael Furtman

MALLARD BY BILL MARCHEL

THE **prairie pothole region** is North America's duck factory. As much as 50 percent of the continental waterfowl population is produced among these 300,000 square miles of plains grasslands and glacially formed lakes that stretch across five states and three Canadian provinces. Within the pothole region the duck-producing powerhouses are glaciated eastern North and South Dakota. Substantially more than half of pothole region waterfowl originate in Dakota wetlands.

Just a century ago, the quality of Minnesota's habitat exceeded that of the Dakotas and likely produced far more ducks. Recent research suggests that Minnesota's role as a producer of ducks could once again become pivotal.

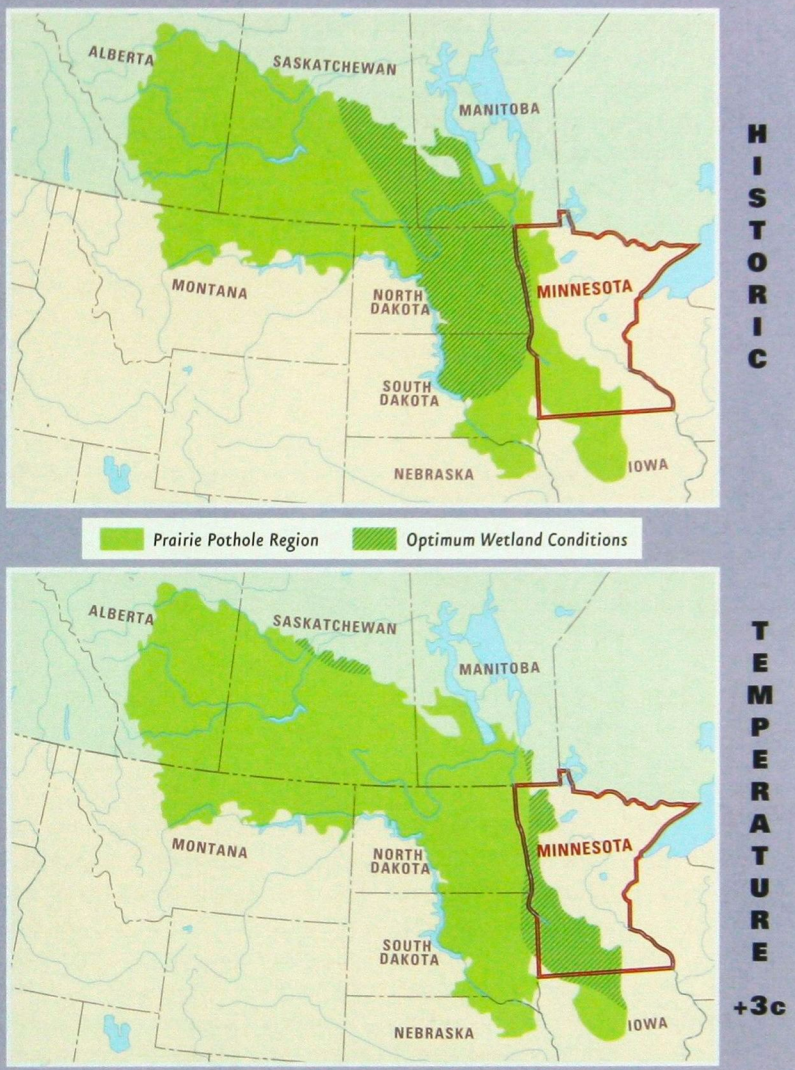
A study published by scientists from the U.S. Geological Survey, South Dakota State University, and the University of Montana looked at what might happen to prairie wetlands as the climate changes. Using the most conservative predictions of higher temperatures, they found that the "duck factory" could shift eastward into western Minnesota and northwestern Iowa as the Dakotas and northeastern Montana dry out.

Will western Minnesota be able to resume its role as a major duck producer? That depends on Minnesotans' commitment to restoration of wetland and grassland landscapes. A wetland surrounded by cropland provides minimal cover, leaving nests vulnerable to predators or agricultural machinery. To reproduce successfully, ducks need large blocks of both wetlands and grasslands with lots of natural cover.

Fortunately, efforts are already under way to restore wetland–grassland complexes and shallow lakes in Minnesota's portion of the prairie pothole region.

Duck Forecast. According to the study report published in the journal *BioScience* in 2005, most climate change scenarios will result in drier wetlands in the western prairie pothole region and a rise of 3.6 to 6.1 degrees Celsius air temperature (roughly 7 to 12 degrees Fahrenheit) in the northern and central Great Plains by the end of this century. Milder winters, earlier springs, warmer and drier summers, and longer growing seasons are expected.

"Everything will shift to the east," says Carter Johnson, professor of ecology at South Dakota State University and lead author of the research. "The more favorable climate in the future [for waterfowl breeding] will be western Minnesota and extreme [eastern] fringes of the Dakotas. The problem with that is we've drained almost all of the wetlands."



MAP BY MATT KANIA; SOURCE: "NORTHERN PRAIRIE WETLANDS AND CLIMATE CHANGE", W. CARTER JOHNSON, BRUCE V. MILLETT, RICHARD A. VOLDSETH, USDA FOREST SERVICE

Shrinking Duck Habitat A study published by the U.S. Geological Survey, South Dakota State University, and the University of Montana predicted how duck breeding habitat might be affected by climate change. One scenario forecast that the area of ideal wetlands for duck production would shrink and shift southeast into Minnesota as wetlands dried out in the Dakotas and Canada.

Minnesota has lost 90 percent of its prairie wetlands and grasslands. And if Minnesota can't help compensate for the lost duck production in the Dakotas, the outlook is dire. Johnson says that duck numbers naturally fluctuate from year to year, but with climate change even the best production years could be half of what they are today.

Hunters at Heron Lake in 1910 found a bounty of migrating ducks—more than 700,000 canvasbacks alone, according to some settlers' reports.

TRUMAN WARD INGERSOLL, MINNESOTA HISTORICAL SOCIETY

Bygone Breeding Habitat. Researchers Rex Johnson of the U.S. Fish and Wildlife Service, Michael Kjellsen of South Dakota State University, and Duane Pool of Ducks Unlimited are attempting to map what Minnesota's prairie wetlands landscape looked like in presettlement times. They formed the Restorable Wetlands Working Group in 2000 to identify where existing and lost wetlands (prairie potholes) are embedded in the glaciated tallgrass prairie. For example, their research showed east-central Jackson County once had 8,940 acres of wetlands. Today, only 1,280 acres (much of it severely degraded in quality) remain. The researchers estimate that this loss has reduced habitat for dabbling ducks by 92 percent.

The once vast wetlands and fertile soils that were a part of Minnesota's virgin prairie comprised a duck factory likely unparalleled in North America. The soils of Minnesota are far richer than those of the more westerly and northerly portions of the prairie pothole region. And soil is as important to growing ducks as it is to growing corn: The richer the soil, the richer the wetlands that feed waterfowl.

Where conditions are ideal, ducks tend to decrease their territory size because not nearly so much space is needed to provide for a breeding pair's needs. In addition, lush environments usually lead to greater survival rates of the young and perhaps even lower mortality rates among adults. Minnesota's potential to produce more ducks per acre of habitat than the drier, less fertile Dakotas provides at least some hope of stemming the predicted loss of waterfowl breeding numbers.

Can Minnesota Do It All? According to comments on the climate study from the U.S. Geological Survey Patuxent Wildlife Research Center, the eastern fringe of the pothole region is unlikely to compensate for all of the habitat losses farther west. About 95 percent of wetlands in the east (including Minnesota's intensely farmed prairie region) have been drained for crop production. The pothole region will have fewer ducks, but the center says restoration of wetlands and upland nesting habitat in the east could diminish some of the effects of increased drought in the west.

"We can pick up some of the slack," says Steve Cordts, waterfowl staff specialist with

US FISH AND WILDLIFE SERVICE, HABITAT AND POPULATION EVALUATION TEAM, KEY BY MATT KANIA

Southwest Heron Lake area, circa 1892

Southwest Heron Lake area, today

Draining of Heron Lake

Drainage ditches were highly effective at turning prairie wetlands into farmland, with disastrous consequences for the native ecosystem. About 85 percent of the Heron Lake watershed has been drained. The wetland-rich prairie landscape disappeared. Without wetlands to catch rainwater, Heron Lake has been flooded by ditches carrying three times as much water from the surrounding area. Deeper water has allowed nonnative carp to thrive. The fish feast on invertebrates (prime duck food) and stir up sediment, which clouds the water and shades out aquatic vegetation. As waterfowl breeding areas among prairie wetlands vanished and food sources on Heron Lake diminished, suitable habitat for dabbling ducks has been reduced by 92 percent.

Natural wetlands
Drained wetlands
Current waterways

Ditches (above) funnel water away from historic prairie wetlands and carry phosphorus and fertilizer that impair the few wet areas that still exist. Depressions in farm fields that fill with rainwater (below) are the only vestiges left of some glacially carved prairie potholes.

the Department of Natural Resources. Cordts helped write the DNR Long Range Duck Recovery Plan, published in 2006, which aims to restore Minnesota duck production. It has a clearly stated goal for its 50-year timeline: Recover breeding and migrating populations of ducks in Minnesota for their ecological, recreational, and economic importance to the citizens of the state.

To reach this goal, the DNR plan aims to increase Minnesota's breeding population of ducks from its current annual average of 626,000 to 1 million ducks. The plan emphasizes the need to focus on restoring and protecting 4- to 9-square-mile habitat complexes.

"But the Dakotas each have a million breeding mallards some years," says Cordts. "If it dries up and they lose half of that, we don't have the capacity for an additional [million] breeding mallards."

Rest Stops. It wasn't just waterfowl production habitat that changed dramatically over the years. Minnesota—blessed by its location in the Mississippi Flyway and its abundance of lakes, wetlands, and rivers—has always been a significant rest and food stop on duck migration routes. Shallow lakes once hosted rafts of ducks, geese, and swans. Usually less than 15 feet deep, these lakes had lots of emergent vegetation for cover and aquatic invertebrates for food, offering migratory waterfowl top-quality stops during spring and fall.

Ditches, built to drain potholes to create cropland, altered shallow lakes. Along with water, ditches can rapidly move topsoil and fertilizer into lakes, clouding their waters. And ditches can sometimes allow fish to migrate from one body of water to another. Nonnative carp have entered some important waterfowl lakes. Like aquatic hogs, carp root around in the muck with their snouts, looking for food. This action increases water turbidity, thus blocking out sunlight that is critical for aquatic plants and insects on which waterfowl feed. Today, shallow lakes are often devoid of waterfowl or visited by fewer than in the past, because the food just isn't there any longer.

The duck plan aims for a fall flight of 1.4 million ducks originating from Minnesota (compared with 800,000 fall ducks under current conditions) and a duck harvest of 16 percent or more of the total Mississippi Flyway harvest (compared with 7 percent in 2007). Two out of every three ducks harvested in Minnesota are migrants, and shallow lake habitat is critical for attracting migrant ducks in fall. So the duck plan also calls for improving the condition of shallow lakes.

"We are making good progress given the resources we have available," says Ray Norrgard, DNR Wetland Wildlife Program leader. "However, the goal of managing 1,800 shallow lakes is a long way to travel at our current rate of progress.

"Our partnership with the Ducks Unlimited Living Lakes Initiative is obviously an important element in making this progress. The slate of projects funded by the Lessard-Sams Outdoor Heritage Council will add considerably to the progress toward duck plan goals."

The heritage council recommends how to spend new money from the outdoors heritage constitutional amendment.

"The emphasis of what was funded this year was right in line with the duck plan: wetlands and grasslands and shallow

MICHAEL FURTMAN

lakes," says Cordts. "Without the passage of the amendment, we would have had to talk pretty soon about revising the duck plan's habitat goals downward."

The DNR shallow lakes program has shown tangible results. Lake Geneva in Freeborn County and Lake Maria in Murray County had few, if any, emergent or submergent plants prior to recent management treatments. These plants serve as duck foods, or provide food and habitat for the aquatic insects that ducks eat. The DNR drew down water levels at both lakes in 2007. In 2008 the DNR treated Lake Geneva with a fish toxicant to kill remaining carp. Follow-up surveys in 2008 found both lakes had lush beds of submergent vegetation and extensive emergents. Both lakes had superb duck use in the spring of 2009.

Private Lands. The duck plan also recognizes that private land plays a critical role in providing habitat. Sixty-three percent of the projected additional wetland habitat and 56 percent of additional grassland must come from private landowners. According to the Board of Water and Soil Resources, Minnesota added well over 40,000 acres of grasslands and wetlands in 2006 and again in 2007, as farmers retired marginal land through the federal Conservation Reserve Program. Most of this land was in the prairie pothole region.

Unfortunately, high corn prices also caused many farmers to opt out of their CRP contracts and to plow up grass to plant corn. The loss of CRP contracts in 2008 caused a net loss of just over 40,000 grassland acres. A new federal-state-local partnership in Minnesota is offsetting some of those losses. The federal Wetlands Reserve Program, combined with the state's Reinvest in Minnesota Reserve Program, is restoring and permanently protecting wetlands and native grasslands. In 2008 this partnership enrolled nearly 10,000 acres of wetland–native grassland complexes in perpetual conservation easements. The partnership will enroll another 13,000 acres in 2009.

"We need farm programs like the Wetlands Reserve Program to be fully funded if we are going to be successful in providing wildlife habitat on the prairie," says Norrgard.

Ever-changing Epicenter. Ducks have a way of finding the best habitat. If the DNR and its partners are successful in restoring habitat in Minnesota, there is little question that the ducks will make use of it. There is no downside to these restorations, at least as far as ducks are concerned. Whether or not the prediction of drying prairies to our west comes true, additional habitat in Minnesota will benefit ducks, duck hunters, and a wide range of wildlife.

"We've seen duck production shift before," says Cordts. "In the 1970s the epicenter for duck production was in Canada. In the 1980s when the Dakotas were dry, more mallards were produced in Minnesota than to the west.

"Then came CRP and restoration efforts in the Dakotas, followed by nearly a decade of wet years there, starting in the mid-'90s. The epicenter of duck production shifted because the Dakotas had grass in place when the water returned, and duck production soared.

"The important thing is to have the habitat in place when the conditions change, habitat consisting of complexes of wetlands and grasslands."

Duck numbers in Minnesota are greatly diminished, but recent waterfowl breeding population surveys show some promising signs. The 2009 survey estimated 236,436 mallards (above), which was 6 percent above the long-term average since 1968. The 2009 estimate of 61,000 ring-necked ducks (below) was the third highest on record.