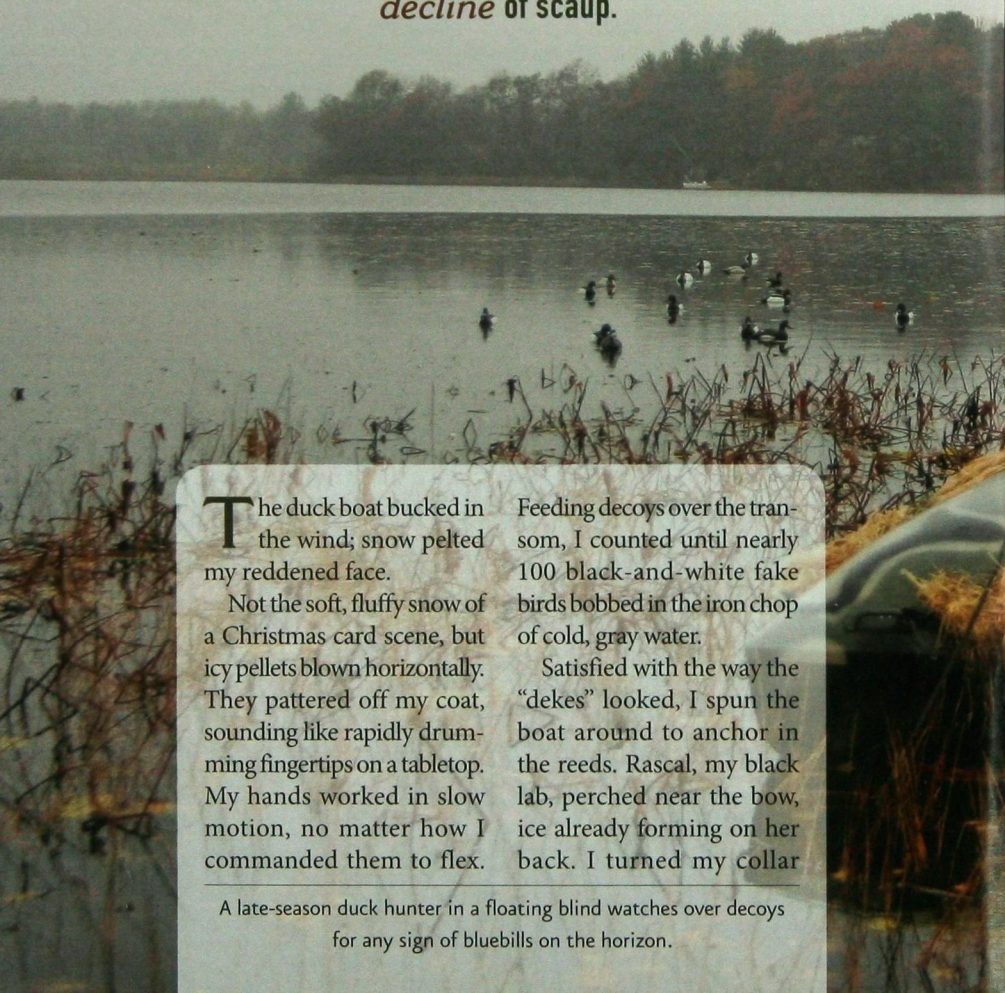
Bluebills

Where have all the *bluebills* gone? Waterfowl biologists are searching for answers to the startling population *decline* of scaup.



The duck boat bucked in the wind; snow pelted my reddened face.

Not the soft, fluffy snow of a Christmas card scene, but icy pellets blown horizontally. They pattered off my coat, sounding like rapidly drumming fingertips on a tabletop. My hands worked in slow motion, no matter how I commanded them to flex. Feeding decoys over the transom, I counted until nearly 100 black-and-white fake birds bobbed in the iron chop of cold, gray water.

Satisfied with the way the "dekes" looked, I spun the boat around to anchor in the reeds. Rascal, my black lab, perched near the bow, ice already forming on her back. I turned my collar

A late-season duck hunter in a floating blind watches over decoys for any sign of bluebills on the horizon.

Text and photography
by Michael Furtman

The author's Labrador retriever returns with a bluebill drake in her mouth.

against the wind and poured a cup of coffee, warming my hands around the mug before taking a sip. Fierce as the weather was, dangerous as the frigid waters were, miserable as my body felt, there was no place on earth I would have rather been than Lake Winnibigoshish, looking for bluebills.

In the upper Midwest, particularly in Minnesota, the pursuit of bluebills—the common name for two closely related species of diving ducks, lesser and greater scaup—is a cherished waterfowl hunting tradition. Many of Minnesota's most famous duck camps evolved because of bluebills, because the state is blessed with many big lakes where scaup like to rest during fall migration. Bluebills arrive in November, hurtling themselves through cold winds. Medium-sized ducks, they dive into decoys like a Labrador tears into a sack of food; the paper-ripping sound of bluebill wings beckons duck hunters to the marsh.

Today, bluebills appear to be in jeopardy, and the cause of decline remains unsolved. Conservation groups and agencies are focusing considerable energy and resources into solving the puzzle.

Two Species, One Problem

Because greater scaup *(Aythya marila)* and lesser scaup *(A. affinis)* have nearly identical plumage (greater scaup are bigger), they are not counted separately during aerial surveys. Lesser scaup are estimated to constitute 89 percent of the continental scaup population. According to waterfowl surveys, that population has steadily fallen during the past two decades from an estimated 7 million in spring 1983 to 3.5 million in 2007.

But scaup populations have not declined uniformly across their breeding range. On the tundra and the prairie pothole region, scaup numbers are relatively stable. But between the tundra and the prairie, where up to 70 percent of scaup nest in the western boreal forest of Canada, the bluebill population has plummeted.

Bluebill harvests by Minnesota hunters have plummeted too. In some remarkable years during the late 1960s and early 1970s, Minnesota scaup harvests exceeded 100,000 birds. More typically, annual harvests in recent decades ran between 30,000 and 70,000 bluebills. The decline in scaup harvests started in 1998. By 2004 and 2005, hunter harvests averaged 14,000 bluebills, just 2 percent of the state waterfowl bag. Last fall Minnesota hunters took 23,000 scaup.

According to Alan Afton, waterfowl biology professor at Louisiana State University and one of the world's foremost authorities on scaup, waterfowl population dynamics are driven by two factors: survival and reproduction (especially number of young that make it to flight stage).

Banding studies of lesser scaup from 1950 through the present show no long-term declines in adult lesser scaup survival, nor any impact attributable to either restrictive or liberal bag limits.

"Granted, we wish we had better data," Afton said, "but based on what we do have dating back to the 1950s, scaup survival hasn't declined. That tells us that hunting isn't the issue. What it does point to is some kind of reproductive failure."

First of Three Ideas

Afton and other biologists have developed three theories as they attempt to find reasons behind the bluebill decline.

The *contaminant theory* relies on research

conducted by state, federal, and Canadian agencies on scaup migrating across the Great Lakes. In one study, researchers examined adult female scaup and found 100 percent of greater scaup and 77 percent of lesser scaup had elevated selenium levels, which could cause reproductive impairment. Selenium is a semimetallic trace element occurring naturally in some soils; it is also a byproduct of smelting operations and other industrial activities. Although selenium is nutritionally required by birds in small amounts, it is highly toxic in greater quantities.

Scaup ingest large doses of selenium when they consume zebra mussels. These nonnative mussels trap pollutants such as selenium, which accumulates in their flesh. When migrating across the Great Lakes, scaup eat large quantities of mussels.

Interestingly, studies have not found high selenium concentrations in scaup eggs. "That may not be such a big surprise," said Afton. "It could be that the hens with high levels of selenium simply fail to lay eggs at all. So not finding it in eggs does not rule this theory out."

Second Theory

The *spring foods theory* hypothesizes that scaup are suffering from a lack of nourishment during migration to their breeding grounds. Up to one-quarter of North American bluebills migrate through Minnesota in spring and

Minnesota's Duck Stamp Legacy

The state migratory waterfowl stamp (2007 edition featuring bluebills pictured here) celebrates its 30th anniversary this year. More than 3.5 million stamps have been sold to hunters, generating $15.7 million to restore wetland wildlife habitat.

The Minnesota Waterfowl Association led the charge to create the stamp, borrowing the idea from the federal duck stamp, which debuted in 1934.

From 1973 to 1976, waterfowl association members worked at the state capitol, talking to legislators and helping to write the stamp legislation.

"Every bit of my vacation time for those three years was spent at the state capitol," recalls

TOM MOEN

Howard Hansen, then the group's president. "We had about 4,000 Minnesota Waterfowl Association members then, and we mobilized almost all of them to call and write their legislators on behalf of the bill.

"One House representative called me one morning and said his office had been inundated with phone calls. 'Call your dogs off,' he said to me, 'I'm going to vote for your duck stamp.'"

The bill passed in 1977. Though proud of the accomplishment, 72-year-old Hansen says he remains worried about the state of Minnesota's duck habitat.

"Wetlands are still being drained and plowed," he says. "Many of the wetlands that are left are filled with carp. And ducks are disappearing."

Hansen sees the current proposal for dedicated funding for wildlife habitat from the state sales tax as the modern-day equivalent of the 1970s Minnesota Waterfowl Association campaign. And he isn't surprised to see duck hunters in the middle of today's debate.

"Duck hunters aren't afraid to tackle tough issues," Hansen says, "and they're tenacious."

spend three or more weeks refueling. If food is scarce, bluebills could fail to store nutrients needed for egg development.

Bluebills in Minnesota in spring rely primarily on small crustaceans called amphipods—also known as bluebill bugs, freshwater shrimp, or scuds. Afton and graduate student Mike Anteau have documented decreased levels of amphipods in Minnesota wetlands and shallow lakes.

"You might not think that the decline in amphipods would make a difference," Afton said, "unless you know that scaup are one of the few ducks that make great use of them. Since scaup specialize on amphipods, when the amphipods disappear, scaup are in trouble. They can't just switch to some other equally nutritious food."

The crash in the amphipod population might be due to drainage ditches in Minnesota's prairie pothole region. These ditches carry farm chemicals in runoff from fields to wetlands, where they can kill amphipods. Ditches also act like arteries that allow fish and minnows to enter wetlands and lakes. Fish not only consume amphipods, but they also can reduce amphipod numbers by stirring up bottom sediment and thus blocking sunlight for aquatic vegetation that shelters amphipods. Warmer winters in recent years have added to the problem by reducing the extent of winterkill of fish in wetlands.

Other research by Afton and Anteau analyzed the health of lesser scaup collected from Louisiana, Illinois, Minnesota, and Manitoba in 2000 and 2001. The researchers found that bluebills wintering in Louisiana were in better condition than those studied 20 years ago. So were spring migrants resting and feeding on the Mississippi River near Keokuk, Iowa. But in northwestern Minnesota, just beyond the area of amphipod-poor wetlands, scaup were in poor condition with low weights.

A scaup with a red tag—identifying it as a subject in a research study—floats in the Duluth harbor.

"We know that the upper Midwest is important to scaup during migration," said Steve Cordts, DNR waterfowl specialist, "but we still don't know how important. It could be that those underweight scaup found in Minnesota paused here because they needed to stop, while the better conditioned scaup simply overflew our state."

To better determine where migrating scaup stop to refuel, the DNR partnered with Ducks Unlimited and several other conservation groups on a research study that implanted 17 female lesser scaup with satellite transmitters. The batteries and equipment should keep working long enough to record the bluebills' fall migration as well. If this year's pilot satellite tracking is successful,

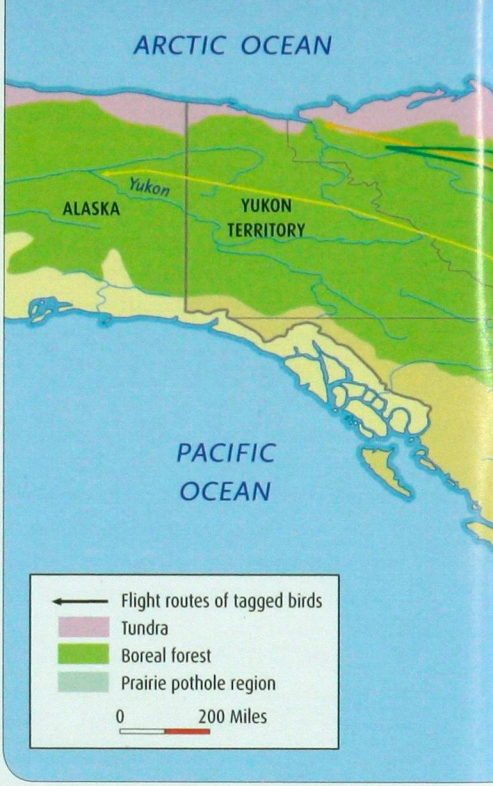
As of July 2007, 14 lesser scaup being monitored by the Ducks Unlimited Scaup Research Project were spread across their breeding range. The project to learn about scaup breeding and migratory habitat, partially funded by Minnesota DNR, began in May when 17 lesser scaup were captured at Pool 19 of the Mississippi River and implanted with satellite transmitters (three have since died). You can see current locations for these bluebills at www.ducks.org/scaupstudy.

the partners hope to increase the number of scaup in the study in future years.

Cordts said the study will help clarify the spring foods theory. It might also reveal important migration areas for habitat protection and restoration.

Third Theory

The *western boreal forest change theory* is the most complex. During the scaup decline, large-scale changes have taken place in Canada's western boreal forest. Mining, oil and gas production, hydropower dams, and large-scale logging have all increased. And this part of the continent has had some of the largest impacts of global warming, most notably the melting of permafrost. Cordts says white-winged scoter nesting populations have also declined there—further evidence that something is changing.



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"We still don't fully understand why western boreal forest ducks are declining," said Cordts. "But it's important to note that it doesn't always take huge changes to affect reproduction. For instance, it's been documented that the permafrost is melting. That changes hydrology. What if wetlands that formerly were full of food just as ducklings hatched now dry up at that time?

Reduced Bag Limits?

While no evidence shows hunting has contributed to the bluebill decline, the U.S. Fish and Wildlife Service reduced the daily scaup bag limit from six to three in 1999, then to two in 2005. This year the USFWS considered a one-scaup bag or a partially closed season, but left the bluebill bag limit at two. The DNR opposed both restrictions. "Two-thirds of the harvest is males and the (overall scaup) population is skewed heavily to males. We know that shooting males has very little impact," says Steve Cordts, DNR waterfowl specialist. Scaup would likely decline even with seasons closed for years, he says.

Cordts thinks duck hunters would support a closed season if

"Or what if, because of temperature change, the ducklings' food sources [insects] emerge later or earlier, and so aren't available? Those are the kinds of things that can impact duckling survival."

Uncertainties Ahead

Both Afton and Cordts agree that all three theories could be correct, each simultaneously affecting scaup to different degrees. The biologists wonder if it's possible to reverse the decline. "Scaup won't ever go extinct, or be really rare, but it will be hard to get them back to the levels of 30 years ago," said Afton.

Cordts concurs. "If it is climate change, then I don't know what we can do," he said. "We evidence showed it would help, but closures or even a one-scaup limit could create new problems. "In a state like Minnesota, where we shoot a lot of ring-necked ducks and redheads (both of which are extremely difficult to tell from bluebills while on the wing), we'd be asking hunters to make an ID on flying birds, a task that even trained biologists can't always do," he says.

Since scaup hunting is hard work in poor weather, the DNR worries a one-bluebill limit might keep hunters from going afield.

"We need hunter support for scaup restoration," said Cordts. "I also don't want to lose that tradition of bluebill hunting in Minnesota. If you lose that, you'll never get it back again."

Three bluebill drakes led by a hen wing south in fall.

need to know more about the life history of scaup to determine if it is possible to effect changes. If not, then the decline is just something we may have to live with."

WHITE-CAPPED waves marched down the length of Big Winnie. Rascal, coated in ice after several retrieves, leaned shivering against my leg. I was as cold as she, and the weather had turned even nastier.

Still the bluebills came. Squadrons ripped down the shore, barely clearing the tall reeds, looking for a lee in which to rest. And rest they would; my gun was cased.

That was more than a decade ago. But since then I've come back. Along with waterfowl biologists and other hunters, I'll continue to watch these birds to learn more about their life history. I'll help recover banded birds when I can, and volunteer some sweat equity and dollars for restoration of bluebills.

www.mndnr.gov/volunteer
View Michael Furtman's online photo gallery of bluebills.