

# BIODIVERSITY Makes It Work

NAWMP in Alberta  
Volume 4, 2002

## What is Happening to the White-winged Scoter?

"We don't really know," responds Pat Kehoe, Manager of Conservation Programs for the Prairie Region with Ducks Unlimited Canada. "We do know that the numbers of white-winged scoter in Alberta are down 90 to 100% since the 1950s, and that the pattern of decline here mirrors declines in the U.S. and other parts of North America."

With the North American Waterfowl Management Plan (NAWMP) launching of the Sea Duck Joint Venture in 1999, much needed research and inventory work will be directed to understanding the population dynamics of the white-winged scoter, a priority species under this joint venture.

Kehoe is in the midst of publishing a report on the status of the white-winged scoter in Alberta, and so far is finding as many questions as facts. Perhaps the biggest knowledge gap is baseline population data. No one has ever, specifically, surveyed white-winged scoters or scoters in general. Numbers that we do have are from casual records or from counts conducted for other birds.

The Canadian Wildlife Service and U.S. Fish and Wildlife Service annual waterfowl breeding surveys do provide some information on population status and trends, but they are not the best data. Counts of all species of scoters are combined together under one category, and the surveys are geared toward species like mallards and pintails in their peak breeding season which usually occurs three weeks before the scoters'. Usual extrapolations from the data won't work because of the scoter's clumped distribution. Nevertheless, it is evident that the white-winged scoter has declined dramatically in southern Alberta, and has virtually disappeared as a breeder there. Overall in Alberta, the population is believed to have declined from more than 100,000 birds in the 1950s to the low tens of thousands today.



The migratory patterns of the white-winged scoter are poorly understood—equal numbers of scoters from Saskatchewan have been found wintering on the Pacific and Atlantic coasts. Researchers have yet to identify many molting and staging areas.

This decline is similar to declines described elsewhere in the prairie and parkland, and indicative of a range contraction toward the northwest. Breeding populations of white-winged scoter disappeared from North Dakota in the 1950s, and from Delta Marsh in Manitoba in the 1960s, where they once represented 20% of the breeding ducks. Similar declines and disappearances have been documented in Saskatchewan. All this despite the fact that the scoter breeding habitats—large permanent wetlands and lakes—have remained relatively stable in quantity if not quality.

It has been suggested that recreational and urban development on these larger water bodies, together with predation from increasing populations of California gulls, may be reducing brood survival of the white-winged scoter. In fact, it is our best guess that the population declines are due to reduced recruitment through decreased breeding success. These ducks normally have low annual productivity because of low duckling survival and low survival from fledging to breeding. Another hypothesis is that the accumulated toxins from wintering areas along the Pacific and Atlantic coasts could be affecting reproductive success.

White-winged scoter hens return to the same area they were raised to breed each year. Therefore, declines of individual populations are likely not the result of a redistribution of the breeding population. Localized harvest that is higher than rate of reproduction may be impacting some populations, but only low, incidental harvest has been recorded in Alberta.

Kehoe is recommending a number of management actions to prevent the continued decline of the white-winged scoter, which may disappear completely from Alberta's prairie and parkland. "A better understanding of the population ecology of this species is key to preventing further declines," maintains Kehoe.

Following are some of these recommendations:

- identify current breeding sites through directed surveys and ongoing population monitoring programs
- evaluate all available survey data to determine the reliability of the decline
- implement research programs to gain an understanding of the interaction between environmental factors and white-winged scoter demographics
- implement banding and telemetry programs to identify migratory routes and relative abundance across all seasonal ranges and moulting and staging habitats.

Kehoe concludes: "Scoters, like many species of sea ducks, have long been ignored by ornithologists and waterfowl managers alike. By implementing research and monitoring programs we can better identify the factors driving scoter populations and thereby develop management strategies to reverse this trend and ensure scoters remain a part of our waterfowl community."

For more information, contact Pat Kehoe at [p\\_kehoe@ducks.ca](mailto:p_kehoe@ducks.ca).

## The North American Bird Conservation Initiative (NABCI) is Gaining Ground in Alberta

Initial steps toward integrated conservation of all four bird groups—waterfowl, waterbirds, shorebirds and landbirds—are being taken in Alberta. Baseline data are being reviewed and gathered, and overlapping priority landscapes are being identified. Here's a snapshot of the activities that are currently underway.

### Waterbirds

A draft plan for waterbird conservation is being developed for the northern prairie and parkland region which includes Alberta. Spearheaded by NAWMP, this plan includes the identification of baseline data and existing knowledge gaps, defining priority species and conservation issues, and setting priority monitoring and research needs.



Franklin's gull, a priority waterbird species

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# NABCI Gaining Ground in Alberta

Gerry Beyersbergen, a wildlife biologist with the Canadian Wildlife Service (CWS), is also the Canadian Chair of the international Northern Prairie and Parkland Waterbird Conservation Plan working group. "So far, our group has been able to identify the priority conservation issues for the Canadian prairie parkland, which include wetland loss and degradation, upland habitat management and deterioration, contaminants, water management, and disturbance and recreation. The top two cross-border conservation issues are wetland loss and upland management," explains Beyersbergen. "There can be more than one human activity associated with each of these conservation issues. For example, agriculture, oil and gas, and urbanization can all lead to the loss and degradation of wetlands."

"We have 40 species of waterbirds in the planning region, with all but one breeding here. Seven are considered priority species, so now all we need to do is establish how to go forward and identify actions based on these species," Beyersbergen continues. "As part of the integrated approach to bird conservation, we'll try to manage habitat for the greatest variety of species, unless there is a significant species in a significant area that needs special attention. This is where we have to use adaptive management, because one kind of management may be good for one species and not for another."

Integration also plays a part in data collection. The ground component of the spring waterfowl breeding surveys have been adjusted to include some waterbirds without too much difficulty. "Using existing programs where possible and continued cooperation of all the partners is key to the success of this initiative," says Beyersbergen. "We consider the public to be one of these partners. For example, naturalists' groups can help gather information on waterbirds, especially on well-known species such as Franklin's gulls and their colony locations."

## Shorebirds

There are about 36 different species of shorebirds observed in Alberta; about 15 of them breed here and the others use our wetlands for migrating and staging. As with waterbirds, more information is needed. "We've really only studied shorebirds for the last decade or so, compared to 60 years of research on waterfowl," explains Beyersbergen. "Still we know that a high percentage of shorebird populations are on the decline. As well, information or knowledge is very limited on breeding densities and how widely the populations are dispersed. This is especially true in more isolated and hard to access locations."

The Canada Shorebird Conservation Plan, just completed, identifies existing baseline data, conservation strategies, priority surveys, habitat management and research objectives. "We already have people working on monitoring and research, looking at how we can integrate habitat programs where priority areas for shore and waterbirds overlap with NAWMP priority areas." Beyersbergen adds, "Because much of the baseline habitat component has already been done for waterfowl in GIS format, we now need to investigate the wetland suitability and the degree or level of use by water and shorebirds on these NAWMP priority areas."



One of our priority shorebird species: the American avocet.

## Water Quality: Gathering Baseline Data on Pesticides in Aspen Parkland Wetlands

Pesticides have been monitored for many years in Alberta rivers, streams and lakes, but up to now data for wetlands were lacking. When David Donald's 1999 article appeared in the *Journal of Science of the Total Environment* with the title "Agricultural pesticides threaten the ecological integrity of northern prairie wetlands," the need to find out how wetlands in Alberta were faring became urgent.

Water quality has become an important issue; never has there been as much interest and concern about contaminants, their sources and the threats they may pose. For the intensely farmed land of the Aspen Parkland, baseline data were needed to determine the variety and concentrations of pesticides found in semi-

permanent wetlands. The same wetlands that are tremendously important breeding, staging and moulting areas for waterfowl, support other wildlife and provide water for livestock and groundwater recharge. A previous study in southern Saskatchewan found pesticide concentrations in many wetlands to exceed guidelines for the protection of aquatic life. Alberta researchers suspected and feared similar findings here.

Sixty semi-permanent wetlands, greater than five hectares in size, greater than one metre in depth and surrounded by both well-established emergent vegetation and annually cultivated fields were selected by Ducks Unlimited Canada for testing in the spring, summer and fall of 2000. Samples were taken from some wetlands on a monthly

## Landbirds

Prairie Partners in Flight brings together everyone interested in Canada's prairie landbirds and their habitat. Landbirds are any birds that have a primarily terrestrial lifestyle. This includes: passerines, grouse, birds of prey, doves and pigeons, hummingbirds, kingfishers, woodpeckers, nighthawks and swifts.

"This is a real diverse group of species," remarks Troy Wellicome, a wildlife biologist with CWS. "Everything from the golden eagle with its 7 ft. wingspan, to hummingbirds weighing as much as a dime, are included. What they have in common is that they require upland habitat. They differ from other bird groups because of the variety of places they are found on the landscape. From north to south, east to west, they are found wherever there is land, unlike other birds which are most often concentrated around water, for example."

The planning component for NABCI, specific to landbirds, includes an overarching coordination of the many people already collecting data and working on habitat. This includes all the members of the Prairie Partners in Flight Work Group who are involved in bird data collection and land management, ranging from the Canadian Cattlemen's Association and Alberta Forest Products Association to Prairie Farm Rehabilitation Administration and Ducks Unlimited Canada.



Conducting the prairie shorebird survey  
(photo courtesy of Gerard Beyersbergen)

"A draft conservation plan which will be available for comment this summer, includes a general summary of what's known, especially about the habitat landbirds rely on, and current conservation activities," says Wellicome. "Also, it'll describe our knowledge gaps and preliminary plans to address them. The status of all landbird species will be assessed."

"We'll be focusing on those species that are not doing very well like the grasshopper sparrow whose population is declining quickly, but is still plentiful enough that relatively small land management actions could reverse the trend," suggests Wellicome. "Another example is the chestnut-collared longspur. It's not declining in our region, but 75% of the world's population is found in the prairie potholes, so we have a high stewardship responsibility to make sure its populations remain stable."

Major sources of data on landbirds include the summer breeding bird surveys, which started in the 1960s, and Christmas Bird Counts in the winter. Both are volunteer-based, again indicating that the public is a contributing partner. These sources will be augmented with landbird data collected by researchers doing grassland bird surveys on the Canadian Prairies.

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basis while others were sampled just once or twice. In total, the samples were tested for 40 different pesticide compounds, phosphorus, conductivity, pH, chlorophyll-a and fecal coliform bacteria. Both surface film and plankton from the wetlands were analysed, along with precipitation samples from the same area.

Pesticide residues were found in 92% of the wetlands sampled in the Aspen Parkland. Sixteen different compounds were found in wetland water, eight in precipitation and five in plankton samples, but none were detected in surface film. Pesticide diversity was greatest in May and June, and pesticide concentrations were greatest in May. As would seem likely, large amounts of precipitation prior to sampling seemed to lead to greater diversity and concentrations of pesticides, and the greater the distance between the wetland and the nearest cultivated field, the smaller the concentration of pesticides (thus indicating that buffer zone width is having an effect). However, the diversity of pesticides in the samples was not affected by the distance to the field.

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## Studying the Effects of Grazing on Bird Populations

A pair of studies in the Aspen Parkland are looking at the effects of cattle grazing intensity on upland nesting waterfowl and other wetland-dependent birds such as songbirds, rails and herons. Jeff Warren, a masters student from Montana State University, is heading up the upland nesting waterfowl and shorebird study, while Robb Stavne's study is focused on birds which nest within the wetland areas. Stavne, from the University of Alberta, is also masters student. Look for information on Warren's study in the next issue of this newsletter.

Stavne heads an ambitious crew that will be back in the field in May 2002, eager to complete their second and final field season for this project. "We'll be doing a couple of things a bit differently this year," says Stavne. "Last year, my assistant and I covered 86 wetlands across 54 quarter sections in the central and south-central Aspen Parkland. For 2002, I'm expanding to a 4-person crew and we'll be surveying approximately 135 wetlands in the east-central part of Aspen Parkland."

By qualifying attributes of wetland habitat throughout the nesting season, Stavne establishes a continuum of grazing intensities (from idled to heavily grazed), across his study wetlands which are distributed among both native and tame grassland pastures. Stavne plans to use a linear regression model to examine relationships between grazing intensity and the diversity, nest density and nest success of wetland-dependent birds.



Lesser scaup nest in heavy grazing  
(photo courtesy of A. Lee Foote)

About one-third of Stavne's wetlands are on NAWMP-managed properties. The remaining two-thirds are on private land. As Stavne observes, wetland habitat can be affected in a couple of ways. "Wetlands are particularly sensitive to cattle grazing. They are generally the first areas to green-up in the spring and are therefore hit early by cattle. This may result in reduced nest density, because without residual cover, many birds are likely to pass these areas by during nest site selection. Wetlands are continually impacted by grazing throughout the nesting season, as they are often the only source of water, minerals and salts for cattle. When a relatively small number of cattle concentrate within sensitive wetland habitats, grazing and trampling can take quite a toll."

Stavne and his crew conducted timed fixed-radius point counts to record the presence of wetland-dependent birds. Nest densities and nest success were determined by nest searching every part of the wetland by foot, and by monitoring nests throughout the nestling and departure stages. In addition to the usual cast of characters, Stavne turned up a sora nest last summer. Soras are a secretive species and very difficult to spot; its nests are even more difficult to find.

As for quantitative findings, Stavne hesitates to say too much until he's completed his second field season. However, he does reveal that preliminary data from 186 nests point to reduced apparent nest success with increased grazing intensity in both tame and native pastured wetlands. Stavne's final conclusions should be worth the wait; his study covers a large area in the Aspen Parkland and examines grazing effects on many species of wetland-dependent birds.

Contact Robb Stavne at [rstavne@ualberta.ca](mailto:rstavne@ualberta.ca)

## What is NAWMP doing for species of concern like the northern leopard frog, burrowing owl and piping plover?

By securing and enhancing wetland and associated upland habitat for waterfowl, NAWMP in Alberta continues to provide the special habitat requirements that may make the difference between recovery and continued decline for these species.

### Alberta NAWMP Properties Suitable for Relocation of Northern Leopard Frogs

Kris Kendell, Alberta Conservation Association biologist with the Northern Leopard Frog Reintroduction project, is happy to say that another potential relocation site has been found, this one at the Alberta NAWMP-managed Hummer Property, south of Pine Lake in central Alberta.

When Kendell put the call out to Ducks Unlimited biologists to come up with a list of suitable relocation sites, he had three strict criteria: quality breeding, summering and overwintering habitat. The frogs must find healthy shallow wetland areas suitable for the development and growth of tadpoles, good adjacent upland habitat for summering, and overwintering habitat that provides adequate temperature and levels of dissolved oxygen. Reasonable access for researchers was also a consideration, but more importantly, the site had to be associated with some kind of long-term protection that would favour the establishment of a new leopard frog population. The Hummer Property has excellent wetland and upland habitat, and long term protection is in place.

Kendell will be considering the Hummer Property as one of a handful of release sites in the Red Deer and North Saskatchewan river drainages used to re-establish breeding populations of leopard frogs. These frogs have been extirpated from the northern parts of their range in Alberta since the late 1970s.

In the third year of the captive rearing and release program, egg masses were once again collected from healthy breeding populations in southern Alberta, and transferred to the Raven Brood Trout Station near Caroline, Alberta, where the frogs were captive reared. In early August, sub-adult



Releasing leopard frogs at a relocation site  
(photo courtesy of Kris Kendell)

frogs were injected with a tiny identification tag between the toes of one of their hind feet and released near the Raven River as before, but also at a new release site near Rocky Mountain House at the headwaters of the North Saskatchewan River.

Kendell is pleased to announce that the program continues to successfully overcome hurdles. "On

June 19, 2001, we re-captured the first of the leopard frogs released from the relocation program. This shows that these frogs were able to overwinter successfully. We also recorded calling activity, indicating that some of the previously released frogs had reached sexual maturity and were in breeding condition."

"The next step will be for these frogs to produce eggs in spring 2002, which will hopefully metamorphosize into frogs. Next spring we'll be back, looking for evidence of successful breeding, including the natural deposition of egg masses from released frogs, and then their metamorphosis, at the Raven River release site. If all goes well, we may find similar success at the new release site near Rocky Mountain House."

Kendell is pleased that additional relocation sites such as the Hummer Property may soon be part of the program. As with many amphibian species, the leopard frog plays an integral role in the function of an ecosystem. "Adding leopard frogs to NAWMP-managed wetlands increases the biodiversity of these sites and the tadpoles along with other age classes provide food for many wetland species." Kendell adds, "The possible use of NAWMP-managed sites for relocations also demonstrates NAWMP's expanding commitment to benefit a variety of species while managing wetland habitats."

For more information, contact Kris Kendell at [kris.kendell@gov.ab.ca](mailto:kris.kendell@gov.ab.ca).

### Alberta NAWMP Habitat Conservation Activities Help Protect Piping Plovers

Reflex Lake straddles the Alberta-Saskatchewan border, 70 km south of Lloydminster. It is a site of international significance and part of the complex proposed for classification as a Western Hemisphere Shorebird Reserve Network Site. More than 30 shorebirds are common to the area; the lake is used by a wide variety of nesting and/or staging waterbirds including the endangered piping plover. Until four years ago, the shoreline of Reflex Lake was being damaged by livestock along with ATVs and other recreational uses.

Alberta NAWMP, together with other partners, developed a long-term agreement to protect the critical lakeshore habitat and associated wet meadow zone.

Cattle and cabin owners had been using Reflex Lake's shoreline and riparian landscape for more than 70 years. The agreement developed by Alberta NAWMP addressed the needs of both agriculture and recreation stakeholders as well as the needs of the area's avian species. A fence was erected along sections of the outer edge of the native parkland

habitat that rims Reflex Lake. This prevents cattle access and ensures that the lake and associated wet meadow zone are free from agricultural disturbance for 4.5 km of shoreline. As well, stock watering sites were installed due to the loss of access to seep areas along the lake. This ensures that nesting piping plovers are undisturbed.

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Unobstructed access to other shoreline recreation areas is maintained through the use of Texas gates on access roads, and walk-through gates on the two existing walking trails. The entire beach within the recreation area has been set aside for the exclusive use of the cabin association. Development of this recreation area will continue, but wetland and wildlife education is now provided for members of the cabin association. A better understanding of the significance of this area and a sense of wildlife stewardship has developed among community members.

A predator exclosure program designed to protect piping plover nests at this site resulted in the banding of 32 young in 2001. Overall, the number of adult piping plovers at Reflex Lake has increased from 31 to 49 in the last five years while the population trend throughout Alberta has been generally downward.

For more information, contact Rick Shewchuk at [r\\_shewchuk@ducks.ca](mailto:r_shewchuk@ducks.ca)

## Burrowing Owls Benefit from Managed Grazing

David Scobie has been working with burrowing owls for the last 10 years, first as Coordinator with Operation Burrowing Owl, and now as President of Avocet Environmental Inc. He's seen burrowing owl populations decline more severely in some areas than in others, although there are still some nearly stable populations too. "The exact cause of the decline isn't known, but it is probably a variety of different factors working together—certainly no silver bullet," suggests Scobie. "Luckily, there is a lot of proactive work being done," he adds. "There has been some exciting research taking place in both Alberta and Saskatchewan over the last six years. There have been radio-telemetry studies on the foraging and feeding habitats of males and juveniles, and there's also a couple of theses in the works. All this can be used to help us work with NAWMP, industry and landowners for the benefit of burrowing owls and other grassland species."

"For example," Scobie explains, "the petroleum industry is trying to minimize their impact on these species, so they hire qualified individuals to do surveys for burrowing owls before they put in pipelines and wells. This is allowing us to identify and monitor even small clusters of burrowing owls." This is great news for a species that's normally spread rather thinly across the prairies.

"One of the most important things for us to keep in mind," Scobie says, "is that the prairie is supposed to be a mosaic. We need both heavily grazed and lightly grazed areas to maintain biodiversity. Species such as the burrowing owl have co-existed with grazing mammals for centuries. They need grazing."

"Responsible grazing as promoted by Alberta NAWMP, with adequate rest rotations, leaves taller cover which creates more habitat for the owl's prey species of small mammals such as mice and voles," Scobie adds.

Operation Grassland Communities, which takes over from where Operation Burrowing Owl left off, always includes grazing when advocating habitat conservation with landowners. As Scobie says, "If you've got burrowing owls on your land, you're doing something right. It's just that when these landowners change their land management practices, they need to take burrowing owls into consideration." It's good news for burrowing owls that everyone seems to be thinking this way.

For more information, contact David Scobie at (403) 793-8500 and Kerry Grisley at Operation Grassland Communities (administered by NAWMP partner, the Alberta Fish and Game Association), at (780) 437-2342.

## More on Pesticides in Alberta Wetlands

The 40 compounds researchers were looking to identify in the samples included 18 of the 30 top-selling herbicides in the area. These included 2,4-D, MCPA, glyphosate and many other herbicides. Although glyphosate is the most commonly used herbicide in the province, it is a compound that has been very difficult to analyse. It was included in the analysis of some wetland samples as a pilot project.



Pesticide sampling  
(photo courtesy of Alberta Environment)

These chemicals are designed to control or kill pests such as weeds, insects or fungi, and have been on the market for many years. Many producers rely heavily on these chemicals to protect their crops. Many thousands of tons of pesticides, mostly herbicides, are applied each year in Alberta. Applications are mostly in spring, but some herbicides are also used in fall for pre-harvest weed control. Insecticides are used as needed; some fungicides may be applied as often as every other week on sensitive crops (e.g. potatoes).

Glyphosate, 2,4-D and MCPA were frequently identified in precipitation samples (each identified in more than 50% of the samples) and there was a relatively high concentration of glyphosate in the wetlands sampled. It is hypothesized that these compounds found their way into the wetlands attached to dust particles blown by the wind, or were knocked down by precipitation and deposited with surface runoff.

Researchers also found that samples with a greater diversity and concentration of pesticides had a tendency toward lower concentrations of chlorophyll-a. This could be significant because chlorophyll-a is an indicator of phytoplankton biomass and phytoplankton is an important food chain component. Less phytoplankton,

could ultimately mean less food for wetland fauna. More research is needed here.

Although only one percent of the Alberta wetland samples contained pesticide concentrations in excess of surface water quality guidelines for the protection of aquatic life (compared to 26% in Saskatchewan), the Alberta study may be underestimating the size and scope of the problem. It was only one year in duration compared to Saskatchewan's five-year study, and the year the Alberta data were collected (2000) was relatively dry, with little surface runoff.

Anne-Marie Anderson, a limnologist with Alberta Environment, and principal author of the report on this study feels caution is required in conveying the information contained in the report. "It is important to separate what we know and understand from what we do not know or understand," Anderson says, adding that: "We now have general information on the occurrence and concentration of pesticides in wetlands. The results are in line with what we already knew about pesticide distribution in agricultural watersheds in Alberta, in the sense that pesticide

residues are encountered commonly, but usually at low levels. This study raises a cautionary flag that warns us about the fact that pesticides are moving off the target site (i.e. crop land)."

Anderson points out that: "At this stage we can say with a reasonable level of certainty that there is not an apparent problem with broad-scale acute toxicity resulting in death of aquatic or semi-aquatic organisms. This is not to say that local problems do not exist, or if they do occur they may not be recognized as pesticide contamination. Based on guideline information we can assume that chronic toxicity for at least some aquatic species is also not a broad-scale issue. Again, this may be a problem in individual wetlands."

"The toughest question, and something we do not know, is what does this mean for wetlands? Research is needed to understand the effects on detailed aspects of biodiversity, food chains, and general 'health' of aquatic organisms and processes. This type of research is at least as complex as the research that is needed to determine the effects of environmental contaminants on human health."

For more information, contact Anne-Marie Anderson at [anne-marie.anderson@gov.ab.ca](mailto:anne-marie.anderson@gov.ab.ca)

North American Waterfowl  
Management Plan



Alberta  
SUSTAINABLE RESOURCE  
DEVELOPMENT  
AGRICULTURE, FOOD  
AND RURAL DEVELOPMENT



Environment  
Canada

Environnement  
Canada



Ducks Unlimited Canada

and U.S. Partners including  
The North American  
Wetland Conservation Act

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