

BIODIVERSITY Makes It Work

NAWMP in Alberta

Volume 3, 2001



Mapping the Road Ahead Taking the DU Decision Support System a Giant Step Forward

Billed by some as the ultimate tool for landscape conservation planning, Alberta NAWMP and its partners are developing a complete GIS landscape inventory for the entire PHJV program delivery area in the province. This tool will prove invaluable to both waterfowl and other wildlife managers.

The existing DU Decision Support System (DSS), in use since 1999, has at its source the historical DU waterfowl habitat inventory for the Prairie



Ducks like this cinnamon teal will benefit from GIS-based landscape conservation planning.

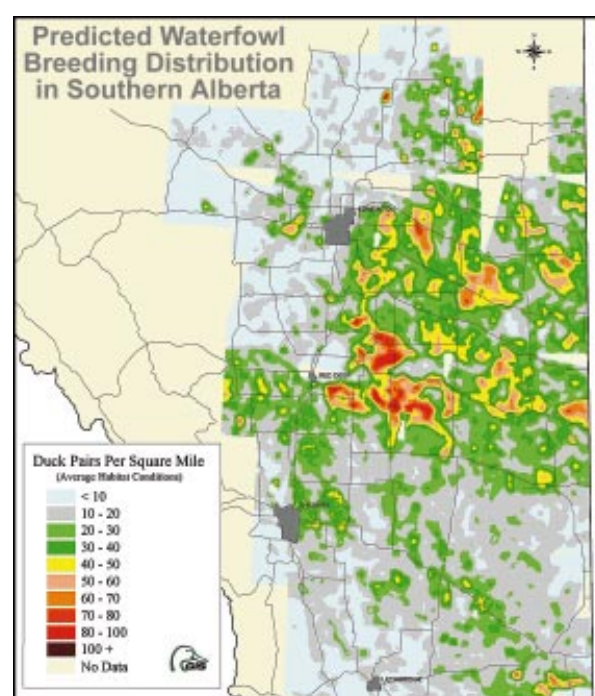
Pothole Region. Although quite reliable in the past, it is based on outdated Landsat data, and its inherent low resolution means there is a risk of overlooking many wetlands in the province, particularly water bodies smaller than half a hectare. With the advent of new remote sensing platforms, Alberta NAWMP is now in a position to substantially improve and augment the existing DSS database.

Taking advantage of this new GIS technology, a new habitat inventory base map will be created for all Alberta NAWMP program delivery areas, including basic information such as location and types of wetlands, and area of wetland habitat. In the future, additional information such as dominant wetland vegetation, water chemistry and

hydrology can be added. Ideally, the new habitat inventory base map would also include basic biological information on native and naturalized upland habitat including habitat type, fragment size and current degree of impact.

The great advantage of the new and improved GIS database will be realized when it is combined with other GIS products in a series of overlays. These overlays will include such information as Canada-US waterfowl survey data, location and extent of drained wetlands, waterfowl habitat, and ownership status (e.g. Crown, private, other) of both wetland and native upland habitat.

Jonathan Thompson, Chairman of the Alberta NAWMP Management Committee and Senior Biologist for the Aspen Parkland with DUC, is a key proponent of this initiative. He believes the new GIS product will provide the basis for all future monitoring of wetlands and native habitat in the NAWMP program delivery areas of Alberta,



Outside of other bird initiatives, overlays of GIS data showing the distribution of species at risk can also identify landscapes of common concern. In fact, even at this early stage, the Biodiversity Species Observation Database, managed by Alberta Sustainable Resource Development, is showing Alberta NAWMP delivery areas in southwestern Alberta to contain several species at risk.

and the best way to identify priority areas for waterfowl production. But that's not all.

"Not only do we see a well-defined wetland inventory system as a core tool to produce planning maps for NAWMP delivery, but we see incredible potential for the identification of common areas of interest with NAWMP partners under the North American Bird Conservation Initiative."

Once GIS databases identifying key habitat areas for shorebirds, waterbirds and landbirds are combined with the updated waterfowl database, landscapes of common interest will become apparent, and opportunities for partnerships realized.

Although development of these other databases is barely underway, Thompson says Alberta NAWMP is in a unique position to accelerate this process. "Through our Biodiversity Fund, we are able to provide some support to assist in data gathering and analysis. Alberta NAWMP is currently funding two studies—one that will assist in delineating waterbird habitat and another that will help ascertain priority landscapes for landbirds in Alberta." Thompson suspects this latter study will show strong links to dabbling duck nesting habitat.

What is Alberta NAWMP looking for in terms of joint initiatives with its NABCI partners? Thompson suggests this may include shared acquisitions of key properties, and joint support for the research necessary to undertake inventory development, which is already occurring with the assistance of Alberta Sustainable Resource Development. The sky's the limit, really!

The Importance of Native Habitat

Between 1995 and 1997, Alberta NAWMP supported four research studies to identify habitat types where the potential for benefiting biodiversity would be the greatest. All habitats surveyed fell within Alberta NAWMP delivery areas and biodiversity was defined in terms of avian communities. The findings of these studies warrant repeating today.

Dr. David Prescott, the chief researcher on these studies, and now with Alberta Sustainable Resource Development, feels these studies were significant because they helped support an idea that many people associated with Alberta NAWMP already believed to be true—that native habitats support greater levels of biodiversity than non-native habitats.



Native habitat provides niches for a broader range of organisms.

Sharptails

Does the habitat preferred by sharp-tailed grouse for nesting and brood rearing differ from other available sites?

Does survival for chicks hatched early differ from those hatched later in the breeding season?
Is chick survival different for those reared in more fragmented verses continuous habitat?

Are leks located in areas with lower proportions of cropland?

Are there more avian predators in areas with higher proportions of cropland?



Doug Manzer holds this sharptail soon after banding. (photo courtesy D. Manzer)

These are the questions Doug Manzer and his two field assistants are devoting some 1000 hours from April to August to answering, in this, the third year of his PhD studies. As for motivation, Manzer need look no further than the results from his first field season in the spring of 2000.

Did you know that the sharptails in Manzer's 2,500-km² study area in southwestern Alberta tend to nest in grassy cover in relatively close proximity to a bush or shrub? Manzer does. It could be a wild rose or a snowberry, but there it is acting like a beacon directing him to a nest. Manzer has also found that sharptails prefer concealment cover (dead grass along with a shrub or two) of at least 20 cm in height, something that is relatively scarce in this area.

But there's more to sharptail habitat requirements than sufficient nesting cover and Manzer's also looking at habitat elements on an intermediate (patch) level and at a landscape level. Those habitat components of particular interest to Manzer are habitat fragmentation and what is known as "edge effects."

At one time, a hundred or so years ago, Manzer's study area was native prairie. Early settlers came and went, followed by modern-day farmers and ranchers. As a result, the landscape has changed forever—gone are the natural disturbances of fire and buffalo, and taking their place are cattle and cultivation, bush and barbed wire. This habitat alteration affects sharptail populations in that cultivated fields provide little or no suitable habitat for breeding or brood rearing. Grasslands, particularly those under managed grazing regimes that ensure sufficient carryover cover for spring nesting, provide more favourable conditions for sharptails. But even here, encroaching aspen stands may be posing a threat to sharptail populations.

Through his research, Manzer is hoping to determine what effect these "edges" have on nest success. The aspen bluffs, and trees planted around old homesteads, can harbour avian and mammalian predators. These are not natural parts of the landscapes, and trees in particular can provide nesting habitat for corvids and raptors in areas where there previously were none. In fact, Manzer has found that sharptail nests within 50 m of a perch site, such as a tree, tall willow bush or telephone pole, are more likely to be depredated than nests farther than 50 m away from a perch site.

Another important aspect of Manzer's research is his investigation into daily chick survival. In 2000, Manzer fitted 40 chicks with transmitters and found a 35% survival rate from hatch to 30 days of age. Manzer is pleased with this preliminary data, but the real test will come when he compares daily chick survival from early and late season nesters. Manzer suspects that early broods will have better survival rates. If his data support this, then there would be increased support for grazing practices that conserve carryover cover. This is a practice recommended by Alberta NAWMP, geared to providing sufficient nesting cover for waterfowl, in addition to agricultural benefits. If early season sharptail broods are more successful, then an increase in residual cover could have a significant, positive effect on sharptail populations.

Sharptails, as with all prairie grouse, are declining rapidly across their range. Some ranchers from Manzer's study area have approached him offering to fence off sharptail dancing grounds or leks. Manzer contends one of the keys to sharptail population growth is adequate nesting and brood rearing cover, and in that way, ranchers who provide carryover cover may be the sharptails' best friend.

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This native prairie in Manzer's study area shows good carryover cover—ideal for nesting sharptails. (photo courtesy D. Manzer)

More on The Importance of Native Habitat

Prescott looked at more than a dozen different habitat types in all NAWMP delivery areas in Alberta: the peace parkland, aspen parkland, and prairie biomes. Generally, ten examples of each habitat type were censused in the spring; all birds seen or heard were recorded.

Six descriptors of the avian community in each habitat were made. These included total number of species, mean number of species per survey, mean abundance of individuals of all species tallied per survey, mean Shannon-Weaver diversity index, an unweighted habitat value based on priority rankings of species as determined by NAWMP, and a NAWMP habitat value, with species rankings weighted according to overall abundance. It is the last value that is considered the best measure of biodiversity for NAWMP planning because it results in higher values for habitats that contain relatively unique assemblages of species.

In all study areas, Prescott's findings were the same: native, unaltered habitats supported the greatest avian diversity. Whether it was sphagnum bogs in the peace parkland, idle deciduous uplands in the aspen parkland, or riparian poplar in the prairie biome, all supported significantly higher avian diversity than non-native habitats which included planted crop and tame grasses. Wetlands, which were only surveyed in one study area, ranked among the best habitats for avian diversity as well.

As Prescott explains, "Native habitats are important because they are usually more complex than habitats altered by human activities, and provide niches for a broader range of organisms. Based on our study findings we were recommending, five or six years ago, that the protection and management of native habitat, particularly grasslands and riparian areas, should be of high priority for habitat retention programs in order to ensure a rich diversity of species at the landscape level."

"Special habitats," Prescott continues, "such as sphagnum bogs and coniferous forest patches in the peace parkland, not only support unique species assemblages but are relatively scarce as well. This emphasizes the importance of protecting these areas. In the southern prairie, the same is true for riparian habitats which are threatened by flood control projects, flood plain development and grazing."

Alberta NAWMP managers have been working to protect remnant perennial cover to secure both waterfowl and biodiversity benefits. While it had



Ducks such as these canvasbacks need to have their preferred, semi-permanent wetland habitat protected.

been thought that habitat restoration and enhancement would be enough to achieve waterfowl population goals, the continued loss and degradation of native habitats, particularly those within agricultural landscapes has proven to be ongoing. As a result, Alberta NAWMP managers are now focused on native habitat retention.

"It is estimated that over 90% of the native habitat in the settled areas of Alberta has been lost or severely impacted by human activities," Prescott maintains. "Once these habitats are gone, they are almost impossible to replace. Alberta NAWMP recognizes that these habitats need immediate attention and will continue to play a key role in their conservation."

Ask an Expert



What is environmentally sustainable agriculture?

Environmentally sustainable agriculture or ESA refers to agricultural practices that maintain the ecological integrity or productive capability of the earth's resources—soil, water, air and wildlife—for use by future generations. This definition, offered by Ted Weins, policy analyst and wildlife biologist with the Agriculture and Agri-Food Canada's Prairie Farm Rehabilitation Administration in Regina, Saskatchewan, places the onus on farmers, ranchers and other land managers to be good land stewards, renewing the soil, protecting water and air quality, and conserving biodiversity.

This seems to be a tall order, but Weins explains that government and conservation agencies can help land managers practice ESA. "The incentives offered by organizations such as NAWMP, level the playing field a bit by compensating farmers and ranchers for delaying haying and converting marginal land to permanent cover." Weins continues, "Research that identifies best management practices, and extension and awareness programs that demonstrate these practices go a long way to helping land managers develop environmentally sustainable operations."

Carol Bettac, Alberta Environmentally Sustainable Agriculture (AESA) Program Manager with Alberta Agriculture, Food and Rural Development adds, "In order for attitudes and farm management practices to change, there needs to be an understanding of environmental issues, concerns and solutions. Sustainable nutrient management, grazing and riparian management, and integrated crop management, including responsible pesticide use, are being promoted by both the agricultural industry and conservation agencies."

What does the future hold for ESA? "To be sustainable, environmentally responsible agriculture systems must also be economically viable and socially acceptable," says Bettac. "The AESA Council represents stakeholders in the agriculture industry and is working to identify key challenges and issues, and deliver programs which move the industry forward toward these goals."

Weins agrees stakeholder partnerships are key to the future of ESA, which he believes is quite positive. "Canadian farmers are participating in the global economy and finding more opportunities and information available to them all the time. The challenge, of course, is to provide the public with the goods and services they desire, in an environmentally responsible manner, and still make a living."

While Weins knows the research, incentives and education programs provided by government and conservation agencies will certainly help, he believes the public can also play an important role. "Although it is the land manager who ultimately decides to operate in an environmentally sustainable way, the rest of us can encourage this decision by supporting research and education programs that provide information on best management practices, by personally becoming better informed about both the environment and agricultural practices, and by exercising our power as consumers. The future of environmentally sustainable agriculture is really up to all of us."

The search for a focal species for habitat management. Could ducks be the answer?

Alberta NAWMP's habitat management programs have had a significant impact on waterfowl production in the mixed grass and native grasslands of southern Alberta. Wetland restoration and enhancement projects, and managed grazing systems, have combined to provide more cover and less disturbance to nesting ducks. Although many people believe that these programs can have a positive influence on the productivity of other avian species, little research has taken place to support this idea, until now.

Nicola Koper, PhD candidate, and Dr. Fiona Schmiegelow are in their second year of field research looking for just such a link. They're using the Alberta NAWMP delivery area around Brooks, Alberta to compare the effects of managed grazing systems on both ducks and non-target (songbird) species.

Few researchers have determined the effects of habitat management on both waterfowl and songbirds in the same area, nor has it been determined whether songbird and duck nests experience similar local fluctuations in nest success. Koper and Schmiegelow hypothesize that if similar processes affect both groups of species, we may be able to determine ways to manage habitat that can conserve both ducks and songbirds simultaneously. Documenting the responses of both groups of species to grazing regimes, landscape characteristics and conservation projects will result in more comprehensive conservation strategies that serve the needs of many avian guilds sharing the same habitat.

Specifically, Koper and Schmiegelow's research objectives are to determine: whether larger or smaller fields support higher songbird and duck diversity and productivity; how deferred-grazed, early-grazed or the absence of grazing affects



The long-billed curlew is a species of concern which appears to be doing well in grasslands managed by Alberta NAWMP.

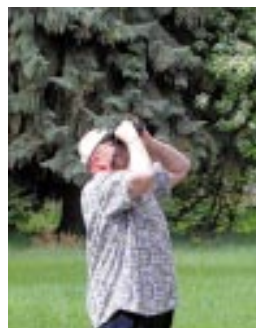
The conservation of the northern prairie biome of Alberta is of significant concern as 77% of bird species known or thought to be at risk occur in this area. In the research undertaken by Koper and Schmiegelow, several of these species were observed, with the abundance of each affected by grazing and/or field size.

diversity, abundance and productivity of avian species; whether linear developments (roads and fences) and habitat edges affect avian species abundance or productivity; and how the amount and distribution of grassland across the landscape affects both ducks and songbirds.

During their first field season in the summer of 2000, Koper and Schmiegelow obtained a "mixed bag" of results, but enough good news to warrant further research. Although some data were sparse, Koper and Schmiegelow showed that while nest success of songbirds increased with field size, and was lowest in early-grazed fields, the nest success of ducks did not respond to either treatment. However, they did find that the

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Champions of Biodiversity



Tom Sadler



Reg Arbuckle



Michael Barr

What do Michael Barr, Tom Sadler and Reg Arbuckle have in common? Aside from being biologists with Ducks Unlimited Canada, charged with implementing the Alberta NAWMP in their areas, they're all passionate about promoting and conserving biodiversity. Here's how they describe their personal and professional commitment to conservation.

Barr, Sadler and Arbuckle agree that NAWMP programs provide them with many opportunities to promote biodiversity. As Barr puts it, "Biodiversity conservation is inherent in the conservation programs we plan and deliver. Although our primary purpose is to benefit waterfowl, we're really protecting and restoring habitat for all wetland dependent species of which waterfowl are an integral part." Barr goes even further by saying, "Beyond the built-in biodiversity benefits of NAWMP programs, we occasionally address special needs of high profile species of concern in overlapping habitat areas."

Another aspect of NAWMP program delivery that helps to conserve biodiversity is the emphasis placed on an ecosystem approach to conservation. Arbuckle sees this as significant. "We try to conserve or enhance enough wetlands, riparian areas and native uplands within a landscape to sustain the entire system in the long term."

As chairman of the Alberta NAWMP Biodiversity Advisory Group, Sadler helps to provide funding to researchers investigating the best ways to manage wetland and associated upland habitats for a multiplicity of species. "It's one of the most satisfying parts of my job," Sadler admits. "We're really making a difference as to how people view NAWMP programs, and we are getting researchers to key in to how best to achieve our goals to the broadest benefit. It is also a delight to work with young people committed to the preservation of biodiversity. They will shape the future."

While it can be said everyone involved with Alberta NAWMP program delivery helps to promote biodiversity, Barr, Sadler and Arbuckle share a strong personal commitment to the environment that

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Parkland Conservation Farm Teaches Youth about Biodiversity

"They just love it!" declares Linda Stewart, Grade 6 teacher at Ashmont Elementary School.

Stewart has been taking her Grade 6 class to the Parkland Conservation Farm (PCF) every fall for the last three years. She finds the farm's interpretive trail and Aspen Parkland Adventure program a particularly good fit with the trees and forests strand of her science curriculum. "The kids learn about the different birds, grasses and habitats," explains Stewart. "They play PCF Jeopardy, and do surprisingly well. Sometimes you wonder if they're listening, but I think it's the combination of just being there in the outdoors and the enthusiastic instructors, that helps the information sink in."



School children enjoy dip-netting at the PCF wetland. (photo courtesy PCF)

This is one of many endorsements pouring in for the Parkland Conservation Farm's Agro-Environmental Education Program (AEEP). On this working farm, 89 km east of Edmonton, Alberta, opportunities are provided for young people to learn about the environment and the important role that agriculture plays in a healthy, diverse landscape. The farm's mission is to demonstrate and promote innovative, sustainable crop and livestock production practices that conserve soil, water and wildlife habitats. Alberta NAWMP delivery staff sit on the farm's Board of Directors and play major roles in the planning and delivery of the farm's integrated approach to agriculture.

Although the PCF was established in 1992, the Agro-Environmental Education Program is only two years old and already there have been more than 6000 participants, 90% of whom are students, some from as far away as Banff, Alberta. Kerri Ceretzke, AEEP coordinator, says their success is due to the interactive and informative activities, wonderful staff and a great facility. "We offer something special, in that students and adults are having lots of fun while they learn."

"I'll continue to take my students to the farm," Stewart maintains, "because it provides a hands-on approach to our curriculum and a positive learning experience."

For more information, contact Kevin Ceretzke (beginning August, 2001) at (780) 764-3927 or aEEP@telusplanet.net

More on

Champions of Biodiversity

motivates them and those around them. As an example, Barr's passion for a broad range bird species resulted in a shorebird census at Beaverhill Lake, eventually leading to its designation as a regionally significant Western Hemisphere Shorebird Reserve Network site. Barr says he takes advantage of every opportunity to keep biodiversity in people's minds. As he puts it, "Protecting and conserving biodiversity is going to pay huge dividends some day in ways we don't fully appreciate now."

Arbuckle is equally concerned about the future. He knows that a diverse landscape will be better able to sustain life. "Many people aren't aware of this and we need to show them that they can take a different approach. Through our communication and extension activities, and partnerships we can help accomplish this." Arbuckle continues, "A prime example is our recent involvement in the third annual Swan Festival in Grand Prairie, which promotes an appreciation and understanding of our natural environment. This will ultimately lead to enhanced stewardship of our vital wetlands and native upland habitats."

Sadler sees internal communication as equally important. "I encourage planning, research and information dissemination which will be of benefit to project managers and act as a resource to those who are designing habitat projects to benefit a multiversity of species."

Sadler is proud to call himself a 'biodiversifist.' Why? "Mankind is but one tiny part of the continuum which is life, and to which we are both spiritually and biophysically linked. All species contribute to that continuum, and it is beyond the capacity of any one human brain to comprehend the role which all organisms will play."



... on the Net?

Lots, that's what! Alberta NAWMP has a new, stand-alone website at www.nawmp.ab.ca.

Click here to find more information on Alberta NAWMP, and its partners, programs and publications. Get the whole picture on how Alberta NAWMP is conserving biodiversity along with our landscapes.

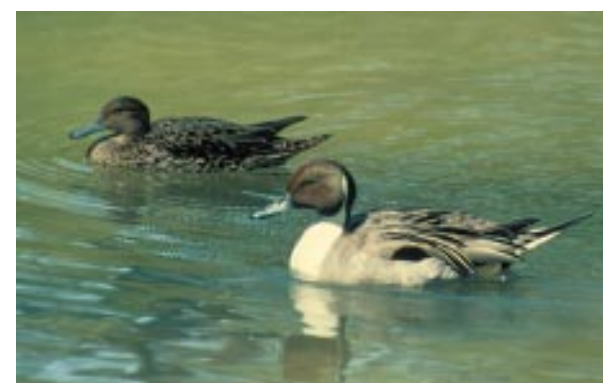
More on

Could ducks be the answer?

nest success of songbirds and ducks were correlated, with relatively high rates of productivity in both songbirds and ducks observed in the same location. The reasons for the correlation are not yet clear. Future research will focus on determining the mechanisms behind this complex relationship.

So ducks may indeed be a suitable focal species for habitat management in the mixed grass prairies. Research undertaken by Koper and Schmiegelow over the next four years will improve our understanding of the consequences of using a focal species to conserve biodiversity, and specifically, will improve our ability to design waterfowl management plans in ways that benefit both ducks and other wildlife species.

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Pintails continue to be at risk in the prairie pothole region.

Alberta NAWMP Partners

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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except where noted.

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Biodiversity Makes it Work

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