

BIODIVERSITY Makes It Work

A Newsletter of the North American Waterfowl Management Plan (NAWMP) Partnership – Volume 8, 2008

Agriculture and Biodiversity: Natural Partners

Various efforts link biodiversity conservation and agricultural progress

After years of gradual development, biodiversity conservation may be poised for major progress across Alberta's agricultural landscapes.

The agriculture industry increasingly understands the value of biodiversity conservation. With new research, services and programs making the adoption of conservation practices even easier for producers, biodiversity is gaining momentum and many enthusiastic supporters.

Contributing to this trend was a research funding proposal to Alberta North American Waterfowl Management Plan (NAWMP) Partnership Science Fund from Dr. Glen Hvenegaard of the University of Alberta. His idea was to evaluate the effectiveness of using bird communities as a measure of farm-scale biodiversity in relation to agricultural best management practices (BMP), illustrating a direct link between the two.

"Biodiversity conservation has always been an important consideration for the NAWMP partners," states Michael Barr, Chair of the Science Subcommittee of NAWMP. "But the biodiversity agenda is complex and challenging to implement. Dr. Hvenegaard's work helped formulate ideas that might lead to new products and programs aimed at meeting this challenge."

Hvenegaard's research built on an established concept that birds are often indicators of biodiversity and environmental quality. He assessed four possible measures of bird diversity to determine which indicators were effective at monitoring biodiversity BMPs. He also considered the use of an indicator species as a possible way to monitor the success of biodiversity conservation in a more timely and cost effective way.

Clear recommendations emerged from Hvenegaard's research. Species richness, or the number of species present in a defined sample area, was identified as the best measure of BMP success. Hvenegaard recommended this indicator as it is practical and intuitive with farmers and landowners and easily incorporated into programming for biodiversity conservation planners.

This was one research report that would not gather dust. The report immediately inspired action.

As Hvenegaard's work was concluding, several NAWMP partners identified the need for an on-farm biodiversity guide. The guide would help agricultural producers with an interest in biodiversity conservation but unsure on how to begin.

NAWMP representatives from Prairie Farm Rehabilitation Administration, Ducks Unlimited Canada and Alberta Agriculture and Food collaborated to create this type of guide. "Hvenegaard's research on how to track the success of biodiversity BMPs helped NAWMP envision how a biodiversity plan should be designed," explains Barr. The end product was the *Biodiversity Conservation Guide for Farmers and Ranchers in Alberta*, a producer-friendly resource that shows how biodiversity relates to and benefits the farm operation.

"We wanted the guide to define biodiversity in ways relevant to producers, stressing practical things that producers could do," says Mark Wonneck, an ecologist with Agriculture and Agri-Food Canada. "Biodiversity at the farm level is important for two broad reasons. The first is that biodiversity has important effects on the functioning of ecosystems, including agricultural production. Secondly, biodiversity is a desired public good and the management of working agricultural landscapes is important to its conservation."

The Hvenegaard research study and the Biodiversity Conservation Guide then became components of a pilot program by Ducks Unlimited Canada (DUC). "Natural Advantage, The On-Farm Wildlife and Biodiversity Planning Service" was launched by DUC in 2007 as a free program for producers and landowners interested in building a comprehensive biodiversity plan for their land.


"There are hundreds of thousands of acres of wetlands, riparian areas, grasslands and wooded



areas on privately managed lands in Alberta," explains Kim Schmitt, the Natural Advantage project director with DUC. "Natural Advantage helps landowners and farmers conserve biodiversity on their land and integrate these habitats more consciously into their larger farm operations. When these habitats become a part of a farm's business, the probability that biodiversity is maintained, or even improved, increases."

The Natural Advantage program will complete its initial year in March 2008, after receiving one year of funding from Agriculture and Agri-Food Canada. The response to the program from the agriculture community was overwhelmingly positive, with approximately 65 farms or ranches assessed. Schmitt believes the pilot program's initial success and scientific foundation will encourage a continuation or expansion of the program.

It is an exciting time for biodiversity conversation in Alberta. While the research activities, the biodiversity guide, and the Natural Advantage program were all distinct efforts, the connection between them and their resulting momentum is undeniable.

"Seeing conservation and agricultural professionals working together to support biodiversity, and further, seeing producers and landowners actively pursuing biodiversity conservation on their lands, is very rewarding," exclaims Barr. "This broadly shared responsibility for biodiversity conservation bodes well for the future." 



Life and Times of the Franklin's Gull

Species is evidence of good conservation practices

Good measures of success are often difficult to find, but thanks to a recent evaluation conducted by the Canadian Wildlife Service (CWS) of Environment Canada, the presence of the Franklin's Gull has been found to be a good indicator of wetland health and a crowning symbol of conservation success.



The three-year study by Gerard Beyersbergen, Beverly Gingras, Ron Bazin, Sam Barry and Wendy Calvert looked at the distribution and abundance of Franklin's Gulls and other associated colonial waterbirds in the prairie, parkland and parts of the boreal regions of the Canadian Prairie provinces. NAWMP provided funding for the second year of the study, which expanded the scope of evaluation on Alberta lakes with a past history of breeding, nonbreeding and staging for Franklin's Gulls.

There was a lack of information on the abundance and distribution for many waterbird species in the Prairies prior to this study. The *Northern Prairie and Parkland Waterbird Conservation Plan* specifically identified 9 waterbird species of high conservation concern, including the Franklin's Gull. With nearly 75 per cent of the breeding range for the world population of the Franklin's Gull found in the prairie provinces, CWS made it a priority to establish baseline information on colony locations and the number of breeding birds in each one.

"Too often we are forced to spend a lot of time and effort recovering a species after they are placed on the endangered list," explains Gerard Beyersbergen, the principal lead behind the study. "While the Franklin's Gull is not on the endangered list, it is believed that the loss and degradation of wetland habitats is a serious threat to the species. This study is a preventative measure - we are trying to fight fires before they start."

In May 2006, Beyersbergen, Gingras and Bazin surveyed 183 water bodies in Alberta, Saskatchewan and Manitoba to record the location and respective breeding population size of each gull colony. Other waterbird species associated with colonies were also recorded. Habitat-related data were collected from the microhabitat scale (nesting site) to the entire lake on all colonies and to the surrounding landscape within a 30-50 kilometre radius of a couple of colonies (foraging range of the gulls during nesting).


Gull breeding colonies are typically situated in large, heavily vegetated marshes. Nests are constructed from plant material and float on the surface, often close together and in large flotillas of 100 to 50,000 nests. This design puts nests, eggs and chicks at risk due to flooding or wave action from human-induced or natural water level changes. "The species as a whole is vulnerable because of their habit of concentrating during breeding periods in a limited

number of locations," states Beyersbergen. "A catastrophe at one large colony could mean losing a major portion of the entire species."

The study found active gull colonies on 16 of 88 wetlands or lakes surveyed in Alberta in 2006. The monitoring effort discovered that most of the lakes with colonies were located within landscapes dominated by agriculture. The gulls were often found foraging for insects in dry or flooded crop fields or on freshly tilled soils. While limited in its ability to assess trends due to a lack of comparable survey efforts, the monitoring study provides an excellent benchmark for future evaluations.

Beyersbergen and his associates discovered that gulls were most often found nesting in colonies that also were home to other waterbird species, such as Eared Grebes or Black-crowned Night-Herons. These other waterbirds may simply prefer the same nesting habitat as gulls or may be actively choosing to nest in association with them to benefit from the gulls' behavioural tendency to guard the colony and ward off predators.

The survey also added to the knowledge of how gulls often move their colony from year to year in reaction to available habitat. Factors such as water level and the type and density of vegetation appeared to be the important habitat variables.

"It was very encouraging to find that some of the healthiest colonies in the Prairie region are located on NAWMP-protected and managed wetlands," reports Beyersbergen. "This was evidence that current conservation and water management partnership efforts are working, benefiting not only waterfowl but species such as the Franklin's Gull and other waterbirds." 



Research Makes the Difference

NAWMP encouraging greater wetland health research

Very few would question the importance of a quality, sustainable water supply to the welfare of our lives, community and economy. But what many don't consider is how the presence and health of natural systems - wetlands and watersheds - are vessels that deliver on this important need.



Governments, media and consumers are increasingly asking questions about the availability and quality of water. Nowhere is this topic more relevant than in arid jurisdictions like Alberta where repeated droughts are reminders of our vulnerability.

While water quality, quantity and relationship to the environment is nothing new to conservationists, the connection between drinking water and watersheds or wetlands is new.

"The 2003 Alberta Environment *Water for Life: Alberta's Strategy for Sustainability* policy guide successfully forged the relationship between healthy aquatic ecosystems and drinking water," states Les Wetter, Chair of the Alberta NAWMP

Policy Subcommittee. "By association, healthy aquatic ecosystems became a public concern. This created a new context and opportunity to include wetland and watershed protection or restoration as part of future public policy."

Along with this new opportunity came many questions. "There are areas where science can help define and guide us in this new territory," explains Michael Barr, Chair of the Alberta NAWMP's Science Subcommittee. "For example, while we all intuitively understand what a healthy wetland is, we need scientifically-based definitions and measures to properly differentiate healthy from unhealthy. Now that the wetland agenda is front and center, we can begin to evaluate these matters in partnership with the academic community."

What is NAWMP?

Partners come together for waterfowl and wetland conservation

What's the only thing better than managing Alberta's waterfowl and other wetland habitats wisely? Coordinating and leveraging resources with others doing the same across the entire North American continent.

That is the notion behind the North American Waterfowl Management Plan (NAWMP), an unprecedented conservation partnership which has transformed cooperative wildlife conservation. "The Plan pioneered the shift from ... site-specific habitat protection into one where (all) waterfowl managers are important participants in making decisions about how to effectively use the working landscapes of North America," states the 2004 NAWMP Strategic Plan update.

Born in the midst of drought conditions and severely reduced waterfowl and other bird populations, this historic international partnership began in 1986. Since then, the Plan has steadily grown and matured and its success is globally recognized as a model for wildlife management.

NAWMP provides an autonomous framework for action and implementation within defined continental priority areas called Joint Ventures. The Prairie Habitat Joint Venture (PHJV) is responsible for action in the Canadian prairie/parkland region; the continent's highest ranking priority area. In each Joint Venture, NAWMP aims to achieve landscape conditions capable of sustaining waterfowl population levels experienced during the 1970's.

All NAWMP efforts have a foundation in a clear, overarching vision and solid, scientific principles. The Plan encourages thinking beyond jurisdictional interests and individual project boundaries to consider synergies best found in a partnership approach.

NAWMP takes life in Alberta through the Alberta NAWMP Partnership, a group of government departments and non-government organizations which share some environmental mandate that can be best achieved through NAWMP.



In Alberta, the NAWMP Member Partners include:

- ◆ Agriculture and Agri-Food Canada
- ◆ Alberta Agriculture and Food – Conservation and Development Branch
- ◆ Alberta Environment
- ◆ Alberta Sustainable Resource Development – Fish and Wildlife Division
- ◆ Ducks Unlimited Canada
- ◆ Environment Canada – Canadian Wildlife Service
- ◆ Nature Conservancy of Canada

Why has the NAWMP partnership thrived in Alberta? "Wetlands and associated natural habitats are as important to ensuring healthy watersheds and sustainable agricultural land as they are to realizing an abundance of waterfowl and other wildlife," declares Brett Calverley, Alberta NAWMP Coordinator. "Alberta has been especially fortunate in that everyone has been engaged and committed to this partnership."

This collective partnership effort not only supports NAWMP, but also compliments the individual

activities of each partner. "The collective effort of all NAWMP partners can achieve more than the individual agencies acting alone," explains Robert Harrison, Acting Director, Environmental Strategies Branch of Alberta Environment. "Through NAWMP, Alberta Environment is able to obtain mapping of existing and lost wetlands. From this mapping we are able to better understand the condition of our wetlands and their watersheds. Healthy wetlands are a key component in achieving the goal of healthy aquatic ecosystems in our province's *Water for Life Strategy*."

In 2006/07 alone, \$17.8 million was invested by NAWMP in new conservation projects, agricultural and watershed extension, wetland-related policy work and research. Approximately seventy-five per cent of the funds are from U.S. sources, with Canadian NAWMP partners supplying the remaining share.

The Biodiversity Makes it Work Newsletter serves an important role in strengthening and promoting this partnership. Its profile of new information and ideas arising from Alberta NAWMP sponsored research both informs and challenges the partners and showcases innovations and adaptations to the broader NAWMP community. 🌀

Research Makes the Difference Continued...

Alberta NAWMP is taking a leadership role in ensuring wetland questions get answered. Wetland health and the relationship between wetlands and watersheds is a relatively new research area added to the evaluation priorities of Alberta NAWMP's Science Subcommittee. Waterfowl and habitat relationships, wetland associated species and



habitat relationships, and wetland components of environmental agriculture initiatives are the other three research priorities.

While it has been a research priority for only two years, Alberta NAWMP is already receiving proposals in this area and is observing increased wetland health research activity. From broad scale, multi-year projects investigating the role of wetlands within watersheds, to smaller but equally important studies into wetland mitigation activities, Alberta NAWMP is excited to support the growing profile and need for information on wetlands.

A Request for Research Proposals is issued by Alberta NAWMP's Science Subcommittee each November. After an initial consultation with the proponent on the research idea, formal proposals are submitted, adjudicated and if successful,

awarded funding. All research proposals are evaluated based on their relevance to NAWMP priorities and on their scientific merit, with preference given to projects where additional partner funding has been secured.

"We are fortunate to have a diverse and committed scientific evaluation team at the table," states Barr. Representatives are engaged from all seven core NAWMP partners, as well as academic institutions and the Royal Alberta Museum. "The adjudication process ensures we fund the most relevant and scientifically sound projects. As well, our efforts connect members and their respective partner agencies to the current, local research scene. The research we support is another example of how the partnership approach of NAWMP advances important items that may otherwise not occur." 🌀

Tracking the Plains Garter Snake

Species provides another compelling case for wetland conservation

It appears the survival of the Plains Garter Snake and broader wetland conservation efforts may be inextricably linked.

The Plains Garter Snake can be found from New Mexico up into central Alberta and Saskatchewan. Like all snakes, Plains Garter Snakes are ectotherms, or cold-blooded, which requires them to choose their habitats based on the abundance of food, shelter, available basking sites and temperature.

There is some research on the Plains Garter Snake in other parts of North America but little study of its existence in temperate climate zones like that found in the Canada's prairie provinces. The seasonal temperature variations in these areas at the northerly limits of its range can be extreme, presenting a challenge to a species that controls its body temperature through external means.


How is the species surviving in this climate? "Our study revealed that Plains Garter Snakes use multiple habitats throughout the year," explains Kryisia Tuttle, who led the research study as a part of her thesis for an MSc in Biology from the University of Victoria. "In the summer, snakes spend most of their time foraging or basking in wetland areas. In the winter, snakes move (up to 2 km) away from wetland sites through adjacent fields to find over-wintering burrows. In these climates, garter snakes need large areas that include both wetlands and surrounding field habitats for survival."

With the support and counsel of her advisor, well-known garter snake researcher Dr. Patrick Gregory, Tuttle used opportunistic captures and radiotelemetry to track the Plains Garter Snake in Miquelon Lake Provincial Park during the summers of 2005 and 2006. Alberta NAWMP's financial support helped the researchers acquire the necessary field equipment to follow the snakes to determine their habitats, seasonal movement patterns and the locations of sites used for over-wintering.

One of the significant findings in the research was the lack of evidence that Plains Garter Snakes use communal dens for over-wintering. "We found that the snakes were hibernating alone or in pairs, which is very different from the common garter snake," states Dr. Gregory. This behavior could result in the snakes spending more time searching for mates in spring or fall leading to an increased exposure to predators.

The information and data collected identified the main habitats and specific habitat features critical to the survival of the Plains Garter Snake. "We provided the results of our research to Miquelon Lake Provincial Park staff so the information can be used to protect and manage the key areas these snakes use," says Tuttle. "It is our hope that this study provides the natural history information to aid in future conservation efforts." Indeed, the research provides NAWMP and others with information that supports future wetland conservation efforts and the ability to assess the benefits of extending these efforts to reptile species.

Initially, Alberta NAWMP's interest in the study may not have seemed intuitive. "For some groups such as birds, the connection to wetlands is well established and studies aim to build on existing knowledge," says Michael Barr, Alberta NAWMP Science Subcommittee Chair. "For other groups such as reptiles, we are still making that connection to wetlands. Alberta NAWMP saw this as an opportunity to document the vital link between wetlands and the welfare of some reptile species."

The Tuttle-Gregory research adds much needed information and knowledge about the species. But perhaps more importantly, it greatly contributes to the already compelling list of reasons for why wetlands need to be protected. 



What's Online

For more information about the programs, partners and projects covered in this issue, visit these web links:

Agriculture and Agrifood Canada/Prairie Farm Rehabilitation Administration – www.agr.gc.ca • www.agr.gc.ca/pfra

Alberta Agriculture, Food and Rural Development – www.agric.gov.ab.ca

Alberta Environment – www.environment.gov.ab.ca

Alberta Sustainable Resource Development – www.srd.gov.ab.ca

Nature Conservancy of Canada – www.natureconservancy.ca

Ducks Unlimited Canada's Natural Advantage, The On-Farm Wildlife and Biodiversity Planning Service – www.ducks.ca

Environment Canada/Canadian Wildlife Service – www.ec.gc.ca • www.cws-scf.ec.gc.ca

Canadian NAWMP – www.nawmp.ca

Alberta NAWMP – www.nawmp.ab.ca

The Biodiversity Makes it Work newsletter is published by Alberta NAWMP for its partners and supporters across North America, and for all those who are concerned about maintaining biologically diverse and healthy ecosystems.

Contact us at:

Biodiversity Makes it Work
c/o Ducks Unlimited Canada
200, 10720 - 178 Street
Edmonton, Alberta, Canada T5S 1J3
email: b_calverley@ducks.ca

Alberta NAWMP Partners



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