

BIODIVERSITY Makes It Work

NAWMP in Alberta

Volume 1, 2000



Alberta NAWMP's Commitment to Biodiversity Continues

Ten years ago, the first of NAWMP's habitat restoration projects in Alberta was undertaken at Buffalo Lake. By 1991, one year later, the program had expanded across the province. Field activities were planned and delivered by Ducks Unlimited Canada and Alberta Environment; the NAWMP Centre in Edmonton provided expertise in administration, communications, policy development and biodiversity.

As work began on restoring and protecting habitat, primarily for waterfowl, the effects of these habitat programs on all species were monitored. Planners were aware the programs they designed to increase waterfowl production would affect other species and it was important to understand these effects.

Species inventories led to evaluation and to improved program delivery, optimizing multi-species benefits. An inventory of priority vertebrate species conducted in 1992/93, showed that eco-subregions used by these species corresponded well with existing NAWMP delivery areas. A manual of habitat enhancement techniques was developed to show field staff how to further increase biodiversity at the landscape level. Delivery staff, with the help of NAWMP specialists actively sought out opportunities to enhance biodiversity.

Over time biodiversity initiatives were expanded to include cooperating partners and funding was made available for scientific research. When, as a cost-saving measure in 1997, the responsibilities of the NAWMP Centre were transferred to Ducks Unlimited Canada, the commitment to biodiversity was already firmly entrenched at the field delivery level.



Buffalo Lake Landscape,
Alberta NAWMP's First Step Project

Looking ahead, Alberta NAWMP's commitment to biological diversity will continue to evolve. More experts will be added to Alberta NAWMP's Biodiversity Advisory Group. This will provide a broader perspective from which to identify the most important biodiversity issues. Efforts will focus on improving the quality of research supported by Alberta NAWMP and preparing for the many new bird conservation initiatives that are now unfolding.

Looking back, Alberta NAWMP's partners have gained experience no other conservation organizations have in the protection and restoration of wetland, upland and riparian habitats. As a result, a wide range of species have benefited. Alberta NAWMP's success can be attributed to its cost-effective approach to program delivery, its commitment to ongoing evaluation and its ability to build and sustain broad partnerships.

NAWMP or the North American Waterfowl Management Plan represents an international agreement between Canada, the United States and Mexico. Signed in 1986, NAWMP provides a framework for conserving the continent's wetlands and associated uplands for waterfowl.

Throughout Alberta, and the other jurisdictions involved in NAWMP's Prairie Habitat Joint Venture, waterfowl habitat has been secured, maintained or enhanced in order to reverse the dramatic decline in duck populations experienced across North America in the 1980s. Most of these habitat improvements have benefited a wide range of migratory, aquatic and upland nesting birds which share the same ecological requirements as waterfowl.

Since 1989, more than 300,000 hectares (750,000 acres) of wetlands, uplands and agricultural land in Alberta have been conserved. Nearly \$100 million in funding has been provided by U.S., Canadian and Alberta government agencies, as well as by a number of wildlife conservation groups such as Ducks Unlimited.

Alberta NAWMP's delivery team consists of biologists, agrologists, engineers and resource technicians. They design and support programs aimed at promoting the restoration and management of wetlands and connecting ecosystems. Often this requires the cooperation and participation of private landowners, and the incorporation of sustainable agricultural practices.

SPECIES at RISK

Each year Alberta NAWMP supports research and land management initiatives geared toward protecting our species at risk. This support represents one of NAWMP's most significant contributions to maintaining biodiversity.

The Alberta government lists some 25 species of wildlife as being at risk; another 25 species are considered sensitive and may be in trouble. All these species have experienced population declines ranging



Alberta NAWMP provides funding for the study of species at risk, such as this Northern Leopard Frog

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Managed Grazing



Mother Nature knew what she was doing. For centuries, the prairies were grazed by herds of bison. Without fences to confine them, they roamed where they wanted, leaving the landscape in a mosaic of habitat types ranging from completely grazed to not grazed at all. Grassland bird species evolved and flourished under these conditions. In modern times, continuous grazing of native grasslands by cattle has caused the population decline of many of these species. Managed grazing systems are slowly helping to reverse this trend.

What is managed grazing? Managed grazing occurs when a landowner's pasture is divided into smaller units which are then grazed in a planned sequence or rotation. Alberta NAWMP has successfully assisted many landowners in developing managed grazing systems.



Managed grazing system in the Aspen Parkland

These systems have been most effective on large tracts of native prairie where natural wetland basins are dry most years. Using existing irrigation infrastructure, Alberta NAWMP creates permanent and temporary wetlands that mimic natural flooding. This helps to improve range condition and waterfowl habitat.

To maximize the benefits for both waterfowl and cattle, grazing around critical wetland areas is deferred until after July 15 to reduce

livestock disturbances during the nesting season. This also results in more residual grass cover and helps prevent erosion. Rangeland plants enjoy improved vigour and productivity. Cattle production or gain is positively affected. And, for many species of wildlife, the mosaic of grazing patches created by managed grazing provides additional habitat.



Deferred grazing provides increased breeding habitat for species such as this Baird's Sparrow, which are experiencing population declines. (photo courtesy Edgar T. Jones)

Beginning in the early 1990s, Alberta NAWMP began conducting species inventories in order to evaluate the effects of managed grazing systems. Vegetation structure, and species abundance and diversity were measured. All studies showed that managed grazing systems were increasing biodiversity.

At NAWMP's Medicine Wheel project in southern Alberta, managed grazing improved the condition of the native range and created extensive habitat for several bird species that are intolerant of heavy grazing. Tame pastures supported the lowest richness of species followed by continuously-grazed and deferred-grazed native grasslands. Not surprisingly, the native and deferred habitat contained the tallest and densest vegetation.

The deferred-grazed native grassland also received the greatest amount of use by large mammals such as red fox, deer and white-tailed jackrabbits. Prey biomass estimates which included ground squirrels, mice and voles, indicated that the deferred-grazed native grasslands were the most productive of the pastures studied. An inventory of herptiles showed the deferred-grazed native grasslands, which are closely associated with a wetland creation project, to support all four species of herptiles encountered during the study (boreal chorus frog, tiger salamander, plains garter snake and plains spadefoot toad). The tame and continuously-grazed native pastures supported one and two species of herptiles respectively.

The key to the success of managed grazing systems as a tool to enhance habitat is their ability to create a mosaic of habitat types that can support a great number of endemic species such as those described above. The key to landowner support of managed grazing systems is the economic benefits created through improved land management--a true win-win situation.

More on

SPECIES at RISK

from severe to worrisome. The key to recovering any of these populations is identifying the reasons behind the decline. The key to understanding, is research. This year Alberta NAWMP is providing \$51,000.00 in funding, mainly to university researchers, to further our understanding of species at risk.

At times it is slow, painstaking work, but already this research is paying dividends. For the disappearing Sage Grouse of southern Alberta, researchers have identified key nesting habitat, thanks to NAWMP funding, and recommended limited cattle grazing in these areas during the breeding season. NAWMP funding is also supporting a feasibility study into the translocation of Northern Leopard Frogs to central Alberta. Northern Leopard Frogs have been extirpated from this area. Funding for the first relatively comprehensive survey of colonial waterbirds in Alberta, has been provided by Alberta NAWMP. Variables such as nest locations and reported threats, as well as status (based on inferred trends) have been documented. While the populations of five of the species studied appear to be increasing, the overall population trend for Great Blue Herons is significantly decreasing.

For species such as the endangered Piping Plover, for which recovery actions have already been defined, Alberta NAWMP has provided assistance as well. NAWMP planners identified wetlands within the Plovers' range that held potential for habitat improvement. One such wetland complex includes Reflex (Salt) Lake and Killarney Lake near the Alberta-Saskatchewan border. When the shoreline of these lakes was shown to support significant numbers of Piping Plovers,



Endangered Piping Plover

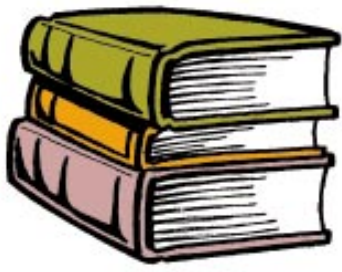
as well as significant levels of agricultural and recreational use, the Alberta NAWMP delivery team became involved. With the cooperation of local landowners, alternate water sites were established and the shoreline was fenced to exclude grazing

cattle. A public education program helped to gain the understanding and support of local recreationists in the recovery of the Piping Plover.

Alberta NAWMP's standard land management programs also help protect species at risk. For example, when Alberta NAWMP assists a landowner in developing a managed grazing system on the prairie landscape, vital native grasslands are protected. As a result, habitat is provided for sensitive grassland bird species such as Sprague's Pipit. Not only is habitat protected through this land management program, but by serving as a demonstration site for improved cattle grazing and wildlife benefits, other landowners are encouraged to adopt managed grazing systems as well.

By tackling the problems faced by our species at risk through research, population recovery activities and land management programs, Alberta NAWMP is working to ensure these species will be here to enrich our landscapes for generations to come.

Ask an Expert



What is Biodiversity?

Biodiversity simply means biological diversity. *Biological* diversity, according to Harry Stelfox, wildlife biologist with Alberta Environment, refers to plants, animals and other living organisms, in all their forms.

One reason biodiversity is important, says Stelfox, is that “people feel we are the custodians of non-human life on this planet. Losing species to man-made causes means we aren’t doing our job.” But biodiversity means more than just species diversity cautions Stelfox, we need to be concerned about genetic diversity and ecosystem diversity as well. The good news is that when we conserve healthy ecosystems, we are also working to safeguard genetic and species diversity.



Invertebrates such as this Water Boatman are part of wetland biodiversity.

Susan Hannon, Professor of Biological Sciences at the University of Alberta tells us that in order to maintain the biodiversity of any ecosystem, we need to understand how the elements of the system interact and how these elements are arranged. This includes everything from the interdependence of wetland species to the sex ratios and age structures of species at risk. “Research will play a critical role in our ability to maintain biodiversity,” says Hannon. “Developing species inventories and monitoring these over time is one way of knowing if we are maintaining or losing biodiversity.”

Does the concept of biodiversity include us? Stelfox says that humans are definitely part of the biodiversity equation “because ultimately our survival, or at least our quality of life, depends on the health of our environment and all its component parts.”

“Worldwide, biodiversity is decreasing.

Rates of extinction are higher than they would be under natural evolution.”

What do the BEST habitats look like?



Generally speaking, most habitats are preferred by one species or another. Species such as the house sparrow thrive in “urban” habitats, while grizzly bears require “pristine” habitats. But, most people would agree that some of our best habitats contain the most diverse assemblages of species.

In order to identify habitats with the greatest potential for conserving biodiversity, Alberta NAWMP researchers conducted bird counts in study areas representing Alberta’s Peace Parkland, Aspen Parkland and Prairie Biomes. More than 40 different habitat types were inventoried; more than 100 species of birds were observed in each study.

In general, these studies showed that avian biodiversity was greater in wetlands than uplands, greater in native uplands than in those under agricultural use, and greater in idled pastures than in grazed pastures.

The types of habitats yielding high biodiversity values varied from one area of the province to another. In the Peace Parkland, sphagnum bogs and wet sedge meadows ranked highly, while in the Prairie, riparian poplar and riparian shrub were some of the most valuable habitats. In the Aspen Parkland, idle deciduous uplands were among the most highly-ranked habitats. All highly-ranked habitats included more diverse and complex vegetation structures than lower-ranking habitats.

These studies provide valuable information to Alberta NAWMP planners and support their efforts in conserving native habitats and promoting wildlife-friendly land use programs such as managed grazing. They also help to identify habitats that are unique or threatened, and in need of protection. These habitats include sphagnum bogs, which are scarce but important in terms of the species they support, and riparian habitats in southern Alberta which are vulnerable to cattle grazing.

Planning for the Future of Bird Conservation **The North American Bird Conservation Initiative**

Across North America, bird conservation programs are targeting waterfowl, shorebird, colonial waterbird and land bird species. Although some integration among these programs and some cooperation between jurisdictions is occurring, much more is possible. The North American Bird Conservation Initiative, or NABCI, is seeking to accomplish this.

The motivation is obvious. It has long been recognized that many different species of birds occur within the same habitat and that an integrated landscape approach to wildlife conservation is necessary. NABCI will provide a framework for delivering all bird conservation initiatives across North America, and it will promote increased efficiencies, enhanced coordination and greater cooperation.

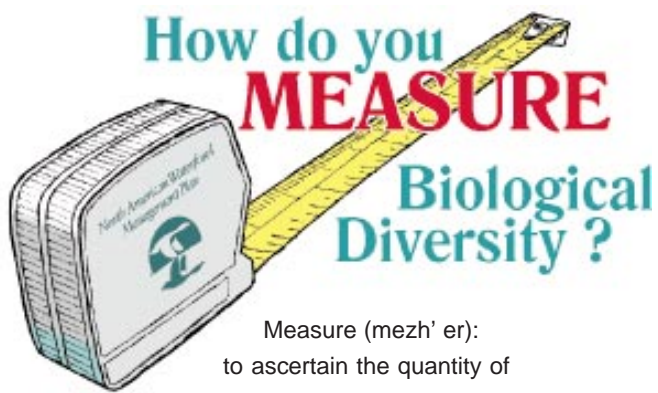
Gerald McKeating, Director of Environment Canada’s Prairie and Northern Region, feels NABCI’s goals are attainable. “When the North American Waterfowl Management Plan was updated in 1998, the concept of broadening the Plan to embrace all birds and all habitats was endorsed,” says McKeating. “We are confident that we can integrate the needs of all migratory birds into one program that impacts the land.”



Great Blue Heron feeding its young. This species is declining in Alberta.

In fact, many of the actions and strategies listed in NABCI planning documents are already being implemented by Alberta NAWMP. These include identifying and securing key bird habitats, promoting voluntary stewardship and sustainable land use, monitoring and evaluating the effects of conservation initiatives, and funding research.

Alberta NAWMP and its partners have been working together to improve the effectiveness of habitat conservation programs, both in terms of cost and multi-species benefits, for some time. Working under NABCI to promote greater cooperation and achieve even greater results is an exercise worthy of support.

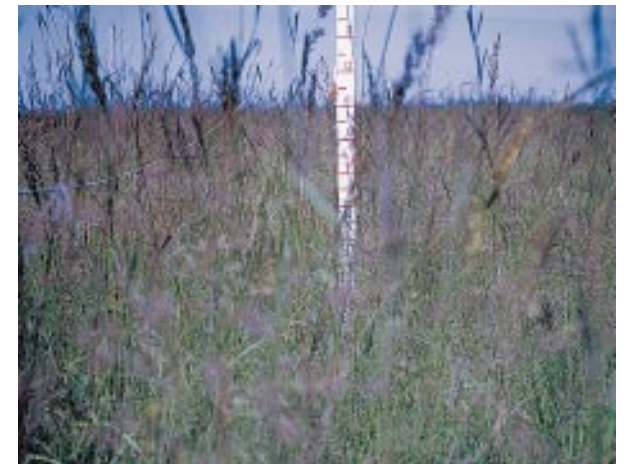


Researchers conducting a bird count

Grassland Songbirds: Two measurements are useful in describing avian communities; these are species diversity and relative abundance. Both measurements can be determined using the *fixed radius point count*. This technique involves counting all birds seen or heard within a fixed distance (radius) of an observer, during a set time period. Distances can range from 25 to 100 m and count durations from 2 to 22 minutes.

In 1993, radius point count procedures for grassland birds were standardized. This facilitated comparisons of bird counts obtained from Alberta NAWMP's prairie landscapes with those conducted in Saskatchewan and Manitoba. Distances were set at 100 m due to the large territories used by grassland birds. Count durations of 5 minutes provided enough time to observe all the birds within the fixed radius, while minimizing the danger of counting individuals more than once.

Vegetation: Diversity in plant life is often a good indicator of animal diversity. One method of measuring diversity in vegetation, the *decimetre pole technique*, has been used on many Alberta landscapes. To do this, researchers randomly choose sample points in areas of interest, then vertically position a metal rod at each point. Information relating to the amounts and types of vegetation occurring at different heights along the metal rod is recorded, along with vegetation height and litter depth. The types of vegetation can be described using categories such as narrow grass, broad grass, shrub, forb and standing dead vegetation. Another method of measuring vegetation involves a portable frame that is placed on the ground. The researcher estimates the percent bare ground and the percent grass, litter and forb cover inside the frame.



Measuring vegetation

Most measurements of biodiversity involve inventories or counts of some kind. The results of these inventories are most useful when they can be compared over time or between locations. In order for the comparisons to be valid, every effort must be made to ensure inventories are carried out systematically and accurately, in adherence with strict scientific principles.

Over the years, researchers have devised precise and somewhat ingenious methods to inventory everything from vegetation to birds. Following are brief descriptions of methods used by researchers to determine the "amount" of biodiversity on particular landscapes. Alberta NAWMP planners compare the biodiversity values of land undergoing habitat improvements to nearby land where habitat work has not been undertaken.

All photos courtesy of Ducks Unlimited Canada, except where noted.

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.

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Did You Know...

Alberta contains six natural regions and twenty natural subregions. Alberta NAWMP activities are concentrated in three large regions with ecologically-similar characteristics. These are the Peace Parkland, Aspen Parkland and Prairie Biomes.



Alberta's landscapes support a wide range of plant, animal and microbial life, including about:

- 90 species of mammals
- 250 species of resident breeding birds
- 50 species of fish
- 8 species of reptiles
- 10 species of amphibians
- 1778 species of flowering plants
- 600 species of mosses
- hundreds of other primitive plant species
- tens of thousands of insects
- an unknown number of microbe and other invertebrate species.

-source: Alberta Environment



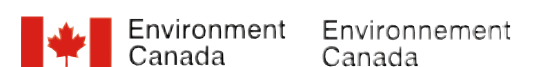
... on the Net?

Learn more about the studies described in this newsletter by visiting our web site at www.ducks.ca/nawmp. You'll find detailed summaries of 18 different research projects measuring the biodiversity values of managed grazing, planted cover and various other habitats. Study areas, methodologies and results are provided, along with sources to contact for more information.

The publishers of this newsletter are grateful to the many dedicated researchers whose work has made this publication possible, and regret that space and format requirements did not permit detailed acknowledgments of their work.

Alberta NAWMP Partners

North American Waterfowl
 Management Plan



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