BIODIVERSITY *Makes It Work*

NAWMP in Alberta
Volume 6, 2004

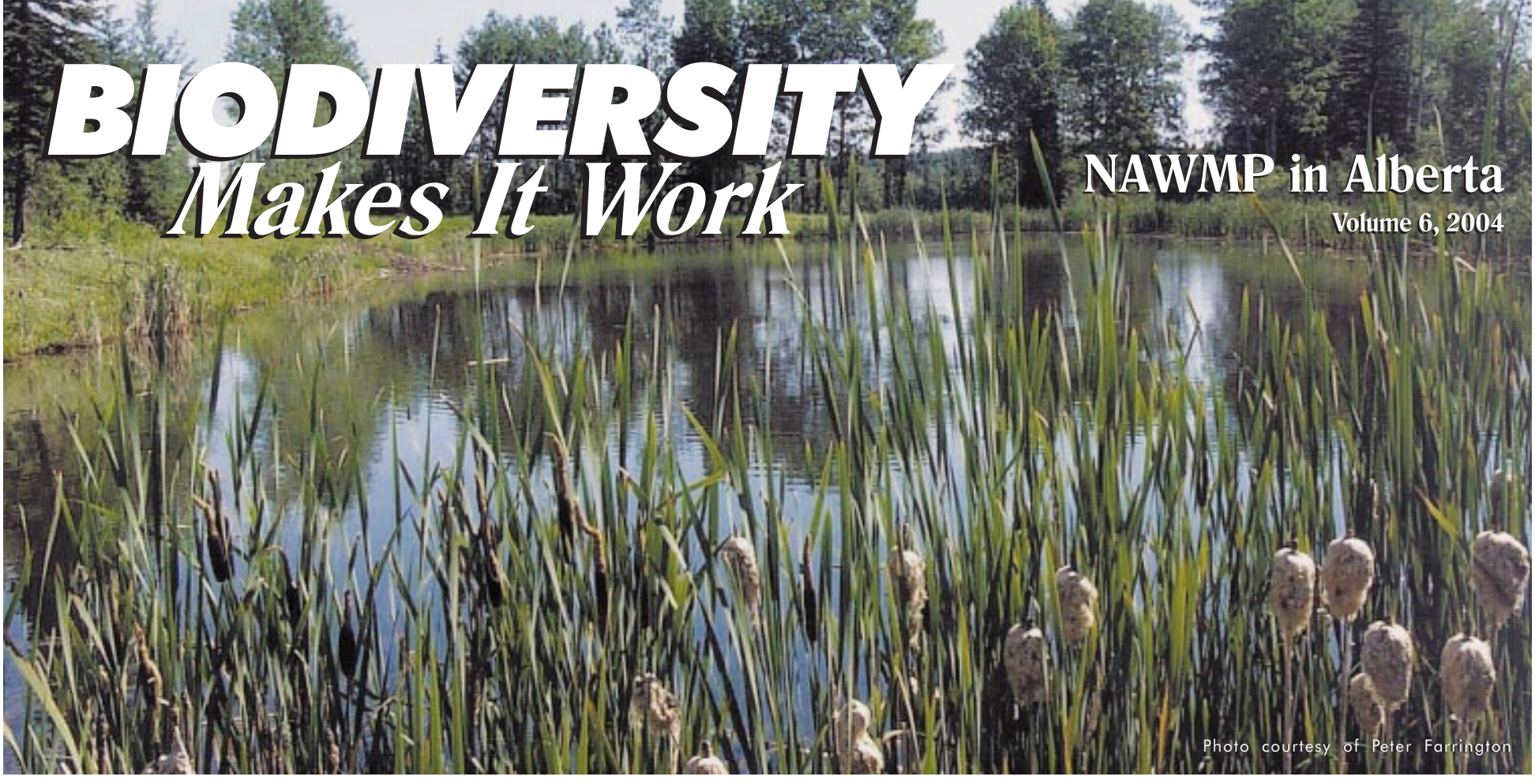

Photo courtesy of Peter Farrington

An Inventory of Alberta's Northern Grasslands

Annette Baker, a biologist with the Alberta Conservation Association, is nearing completion of her three-year study on the native grasslands of the Peace Parkland. Once thought to cover one million hectares, estimates now suggest that only half of one percent of these native grasslands remain.

For anyone who has taken a road trip north of Edmonton into the boreal forest, it may be hard to imagine large areas of open grassland, similar to those found in southern Alberta, just around the corner. But corresponding to the Alberta North American Waterfowl Management Plan (NAWMP) Peace Parkland Biome, and surrounding the centres of Grande Prairie, Peace River, Fairview and Fort Vermilion, there once were significant tracts of native prairie.

Baker and her crew have spent the last three summers identifying and categorizing both large and small parcels of native grassland uplands, moist native grasslands and (river) slope native grasslands. Previous studies have indicated that these habitats are able to support the greatest biodiversity and therefore are of particular interest to conservation agencies.

Following air-photo interpretation and field verification, priority habitat areas were identified as those with a large contiguous area, and those on private land that are thought to be at greatest risk for loss. In total, 446 sites were visited throughout the study area. Of these, 58% were found to be on private land; a little less than half of all sites (47%) had been modified. Two hundred and nine sites were classified as containing native vegetation. Fifty-one percent of these native sites and 24% of the modified sites had been encroached by shrubs, leaving just 104 sites as native upland grassland.

Baker and her crew recorded information such as vegetation and cover composition, classified plant community types and mapped each site, all to provide baseline information. Already threats to remaining grassland communities have been identified including the invasion of agronomic species such as smooth brome. This species could become established in wet areas and then spread, resulting in a mono-crop of this tame vegetation. Another threat is the encroachment of shrubs, the first step to forest cover.

Fortunately, Baker has some theories and solutions already in mind. "Shrub encroachment may be occurring due to a lack of fire, a natural event, or because some soil substrate may not allow the roots of trees to penetrate. We are considering the introduction of fire in some areas through controlled burns. Grazing will also help to keep the shrubs down but too much grazing will threaten the diversity of the grassland vegetation."

She continues, "We will be working with landowners and lessees to conserve the remaining grassland by changing grazing patterns, both the timing and intensity. Producers will also be encouraged to stop feeding tame hay or cleaning their equipment on native grassland. This will

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Shrub encroachment threatens some northern native grasslands. (Courtesy Annette Baker)

This Pike's Old World Swallow Tail is one of 4 species of butterflies that rely on the native grasslands of the Peace Parkland for survival. (Courtesy Annette Baker)

The Northern Prairie and Parkland Waterbird Conservation Plan

A new waterbird conservation plan, due out this spring, provides a snap shot of what we know about the Northern Prairie & Parkland Region's (NPPR) waterbirds and their habitat. More important, the plan outlines strategies and priorities for monitoring, research and management activities for waterbirds, one of the four bird pillars of the North American Bird Conservation Initiative (NABCI).

The NPPR is comprised of the south-central portions of Canada's prairie provinces and parts of five mid-western states. Although this region contains millions of wetland basins, supporting significant populations of many species of waterbirds, our general knowledge of the 39 breeding species found in Alberta is limited. As a result, conservation initiatives for this group have been restricted in the past.

In an effort to bridge the knowledge gap, the plan identifies 54 key waterbird sites in the Canadian prairie provinces, with half of these sites occurring in Alberta. These sites have been singled out because, based on existing data, they support significant numbers of waterbirds, primarily colonial species. An additional 400 sites across the prairies are identified as potentially important, pending an update of historical data on condition, species and level of use by waterbirds, particularly priority species. The majority of all sites identified so far occur on lakes, reservoirs and rivers; the importance of small wetlands and wetland complexes across the landscape is currently an unknown, particularly for non-colonial species.

As evidenced by the number of sites and wetland areas whose importance to waterbirds is yet to be confirmed, resources directed toward

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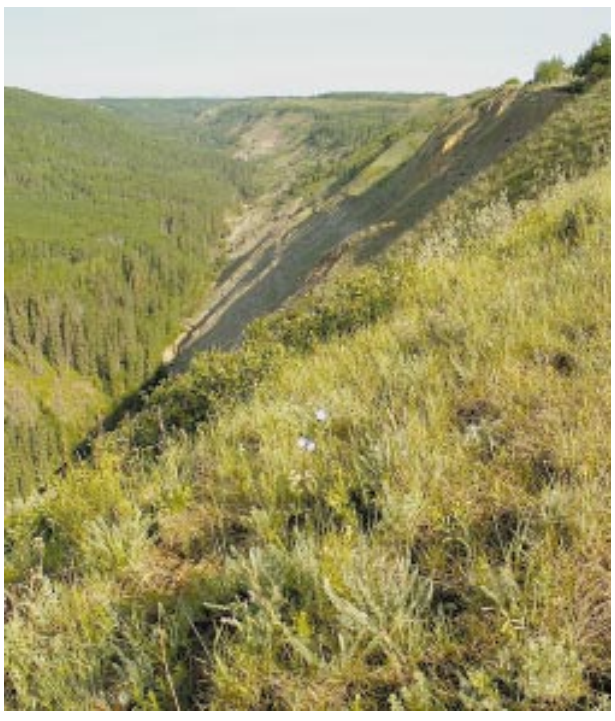
More on An Inventory of Alberta's Northern Grasslands



River slope native grasslands in the Peace Parkland
(Courtesy Annette Baker)

help to prevent the establishment of tame grass species. With the help of staff from the government's Public Lands Division we also hope to establish some long-term monitoring sites to measure species change over time in grazed and ungrazed sites."

One of the challenges facing the implementation of these management solutions is that most remnants of native prairie are relatively small, ranging from a fraction of a hectare to a few hectares in size. Baker is aware that this will pose some difficulties. "We won't be able to manage this northern native prairie in the same way that we manage sections of southern grasslands that are often the size of quarter section or larger. Still, the fact that this habitat is important to many species means that there is a lot of support to conserve it. Upland nesting waterfowl like the blue-winged teal and northern shoveler and landbirds such as clay-coloured sparrows and short-eared owls are just a few of the species that make use of this habitat."

While conducting their field work, Baker and her crew were able to gather complimentary data that will assist three other scientific investigations. Her crew captured range health and plant community information for the Public Lands Division, recorded locations and took samples of rare and monitored plants for the Alberta Natural Heritage Information Centre, and captured moths and butterflies to assist in University of Alberta DNA work into possible range extensions of these insects.

Baker explains, "There is one butterfly subspecies called the Pike's Old World Swallow Tail that is only found on the slopes of the Peace River and its larvae feed exclusively on one plant, the dragon wart *(Artemisia dracunculus).* Three other species need upland native grasslands for their larvae to feed on, so the health of their populations is tied to the health of the native grassland. If these butterflies were to disappear, we'd be losing biodiversity, not just of this type of insect but also of the type of habitat they depend on. Then, other species relying on that habitat would begin to disappear. Because everything is so connected, the loss of one species is really just the tip of the iceberg."

"When we started this project we only really knew about a couple of tracts of native grassland." Baker concludes, "Now we can say that more does remain, and together, these sites are worth looking after for the benefit of future generations."

For more information contact:
annette.baker@gov.ab.ca

Champions of Biodiversity

Many people, from many walks of life, contribute to preserving biodiversity in Alberta. For some it's their job, for others it's their passion, and for some it's both. Read on to learn how a University of Alberta professor and a biologist with the Canadian Wildlife Service 'walk the talk' of wildlife and habitat conservation.

Cindy Paszkowski is a professor of Biological Sciences at the University of Alberta. As a vertebrate ecologist, she has a diverse interest in organisms, teaching courses in vertebrate anatomy and diversity, along with an introductory course in biodiversity.

Paszkowski likes to take a "hands-on" approach to studying biodiversity.

Paszkowski is currently supervising three students working on amphibians in the parkland, foothills, and boreal forest. "There is quite a bit of concern over this group of species," Paszkowski says. "We know very little about the basic biology of amphibians in Alberta and in western or northern Canada. However, we do know that amphibian populations vary naturally from year to year, and that they have a huge reproductive potential, so we aren't sure if current concern over low numbers is warranted. We need to find out if these fluctuations are outside the natural range; an indication that populations could disappear."

As a member of the Alberta NAWMP Partnership's (ANP) Biodiversity Advisory Group, Paszkowski is called upon to recommend land management programs and basic research that would help conserve these species. She replies, "It is difficult to recommend programs for amphibians when we don't know much about them, but two things are certain. If we're going to conserve them, we need to support investigations into their basic biology. Also, we need to conserve their habitat. Amphibians are organisms that bridge aquatic and terrestrial habitats. Other species such as waterfowl do the same, so most Alberta NAWMP programs help to support amphibians as well."

Paszkowski is also a member of the Policy and Steering Committee of the Alberta Conservation Association's Grants in Biodiversity program and the provincial Endangered Species Conservation Committee. These groups seek to increase our understanding of Alberta's diverse wildlife species through student research and make recommendations for their conservation, respectively. She is also a member of the Scientific Advisory Committee for Elk Island National Park and is working with the Park to establish an amphibian monitoring program.

When asked if we, as a society, are winning or losing the battle to conserve biodiversity, Paszkowski's outlook is positive. "I think we are winning in the sense that we are aware of the problem and that we have much of the information and mechanisms in place to address it. It's just a matter of having the political and economic will to act. We have to preserve the habitat to preserve biodiversity."

Like Paszkowski, Brenda Dale, a wildlife biologist with the Canadian Wildlife Service, is also a member of the ANP's Biodiversity Advisory Group. And, like her colleague, Dale is very supportive of the ANP's activities. "As a songbird specialist, it's wonderful to be working with the best and most extensive habitat conservation group in the prairie, one that promotes, as much as possible within its goal, biodiversity."

In fact, most of what Dale does serves to promote biodiversity. Her main focus is on the landbirds and large upland shorebirds that are most characteristic to the prairie parkland region and, in particular, those species that are having the most trouble coping with modern land uses. She wants to see the community of birds that belongs on that landscape maintained. "We know that landscape diversity promotes species richness, and that by increasing the complexity of the habitat we can always add more species to an area. However, if these species are not common or characteristic to the region, then we're not really gaining any ground in terms of biodiversity. We don't necessarily need more species, we need to work on maintaining those species that belong."

Dale says her opinion on whether or not we are succeeding at this depends on the day she's asked. "When groups like the ANP emphasize stewardship or sustainability it makes me feel there is some hope. Healthy landscapes can sustain both species and the economy. By sustainable, I mean that processes like farming or mining can occur over the long term without damaging the environment or its function."

She continues, "A good example is ranchers who manage their land primarily for the health of their grass. It has to be there, and be in good shape, over the long term if they are to stay in business. In that respect, a rancher is the best friend a grassland bird can have."

"However, sometimes we don't have good enough measures to say definitively that certain activities aren't harming the environment, or won't harm it over the long term.

This is where Dale likes most to be--counting birds in the grasslands in the early morning.

From my perspective, working on the non-game evaluation of the North American Waterfowl Management Plan, making sure it's maximizing benefits for other species, and by supporting volunteer monitoring of species to help us understand why some species are in trouble, I'm hoping that we'll be able to tilt the balance in favour of maintaining biodiversity."

Riparian Action Team a Success

In the High Prairie region of northern Alberta, there's a new RAT pack. Not singers and dancers, these guys and gals are the 'go-to' habitat conservation specialists in the area.

Formed in 2001, the Riparian Action Team is made up of government and non-government agencies that have the mandate, staff and resources to help maintain or improve the health of the riparian areas along the shores and riverbanks of this region's many significant water bodies. Focusing on agricultural issues, RAT brings together resource professionals in a team setting to maximize both resources and results. RAT's current priorities are agricultural impacts to Lesser Slave Lake and the watercourses that flow into it.

Mark Heckbert, a wildlife biologist with Alberta Sustainable Resource Development (ASRD), is the group's chairman. Heckbert concedes that while agriculture isn't necessarily the biggest or most pressing threat to riparian health in the area, it's the one they're addressing. "There are significant recreational and resource development issues in this area, but we thought our best chance of success, considering the huge number of stakeholders and stakeholder groups, would be to focus on just one issue. We're looking to gain landowner support that will lead to broad scale community support. We don't want to 'dictate' to the community how to improve riparian health. Instead we're relying on demonstration projects and our cooperative, teamwork approach to deliver high quality habitat protection projects in priority areas."

An example of the RAT's approach and success is the Boisson project located on Winagami Lake.

The central issue at the site was intensive, long-term grazing throughout the snow-free period on the shore of Winagami Lake. With the help of partners, the MD of Big Lakes, Alberta Conservation Association and ASRD, one mile of permanent fencing was constructed and two off-site water sources were developed for the lessee.

This photo shows the dramatic difference at a RAT project site where heavy, all-season grazing occurs on the left compared to a healthy riparian area on the right. (Courtesy Mark Heckbert)

Also, a small wetland in the middle of pasture that received heavy grazing pressure was cross fenced and a management plan developed to facilitate late season grazing, thereby affording waterfowl and other nesting birds habitat protection during the spring. Fertilizer and herbicides were also provided for upland pastures that were heavily grazed and experiencing weed problems. The selling point was a consistent clean water supply and improved productivity in upland pastures through a change in management. From the RAT's perspective, sustainable, multiple uses of this land for wildlife, agriculture and recreation were the pay-off.

The site of another RAT project is Mission Creek, a tributary to Lesser Slave Lake. Here the riparian zone was relatively healthy except for one frequently-used cattle crossing. The landowner, who is also a commercial fisherman, was aware of the important connection between healthy shorelines and healthy fish populations. He didn't hesitate to accept an offer by RAT to provide supplies and technical advice for development of a controlled cattle crossing of the creek.

Heckbert contends that RAT is promoting more than just exclusion fencing. "Temporary electric fencing and the use of solar-powered or nose pumps with plastic pipe that can be moved—neither requiring a significant investment in infrastructure—help landowners separate riparian areas from other pasture lands and manage them differently, working on changes to timing and grazing pressure."

"Ninety per cent of the riparian areas we deal with are adjacent to uplands that are under the same management regime, and allow grazing from April to October," states Heckbert. "In other places we're dealing with unauthorized grazing on shorelines. But so far, we've had 100% success in terms of landowner or lessee acceptance of our demonstration projects. In the end, we'll be measuring our success in terms of community acceptance and improved riparian health in the area."

For more information contact:
mark.heckbert@gov.ab.ca

Is there a RAT – NAWMP Connection? You bet!

These groups share members and the goals of improving riparian health and conserving valuable biological resources such as native vegetation and water quality.

Many priority habitat areas for RAT are also priority breeding and staging areas for waterfowl species such as mallard, northern pintail, teal and wigeon, and for many species of shorebirds and waterbirds as well.

In addition, both groups work with the local community to demonstrate good stewardship of natural resources, garner public support, and affect change on the landscape.

Survival of the Fittest TOAD

Canadian toad (Courtesy Corey De La Mare)

No one likes to be replaced. But what if that's what Mother Nature has decided for you? If you're a Canadian toad, this may be what is happening. It is theorized that the western (boreal) toad is supplanting some populations of the smaller Canadian toad in the aspen parkland. Is this because the boreal toad is smarter, better at catching flies, able to leap farther and faster from predators? And, if it is better able to survive in the Canadian toad's habitat, then why should we care if the western toad takes over? It is the law of nature, after all.

If you ask Connie Browne this question, she'll remind you that both these species of toads are in trouble and warrant our attention. She'll also tell you that we don't have enough data to say for sure what's happening to either species, another reason for concern. Plus, the disappearance of toads from their native range may indicate changes to their habitat that may someday threaten other wetland-dependant species, including waterfowl.

Supported by the Alberta NAWMP Partnership Biodiversity Fund, Browne and three other researchers are studying the relationship between habitat features and the distribution of both Canadian and western toads in Alberta's aspen parkland. The focus of the first year of field work was Elk Island National Park and the adjacent Beaverhills, a priority wetland area for Alberta NAWMP.

Browne explains, "Declines in the abundance and distribution of the Canadian toad have been recorded in south central Alberta, and many other species of amphibians are experiencing declines on a local, regional, and even global scale. In Elk Island National Park, the Canadian toad was first collected in 1962 and last observed in 1986. At that time it was the only toad species found in the park. Since 1999, the only toad species captured in the Park has been the western toad. However, this species has also suffered from population declines, particularly in the northwestern United States."

While it is tempting to speculate that the western toad, which seems to be expanding its range to the east, is pushing the Canadian toad out of the Park, we need more data to be sure. We know these species coexist in other parts of Alberta, but virtually nothing is known of their habitat requirements in the aspen parkland, or how they may interact, making the development of any NAWMP conservation strategies difficult.

During the last field season, the researchers captured as many individual amphibians as they could from the study area in order to gather baseline data. For each toad captured, age class, weight, and the presence of parasites or deformities were recorded. In addition, each toad was marked by removing two of its toes. The clipped toes will be used in future genetic or skeletochronology research.

"We certainly expected that western toads would be more widely distributed than Canadian toads within the Park, and that the habitat requirements of the two species would overlap," suggests Browne. "Unfortunately, we didn't find any Canadian toads in 2003. However, we did find 669 western toads at 47 of the 239 ponds we surveyed." She adds that frogs were much more plentiful. "In total, we found 3,026 wood frogs at 230 ponds and 2,633 boreal chorus frogs at 206 ponds."

Western toads in amplexus (Courtesy Kris Kendell)

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Toads Cont...

Browne continues, "The absence of Canadian toad observations in the Park is not all that surprising as sightings have been relatively few over the last four decades. While the big picture indicates that most water bodies in the study area have the potential to support amphibians, an explanation is needed as to why there was a lack of toads at most sites." Browne suggests that many factors may be at play. "It's possible that specific habitat features required by toads are lacking in many areas or that competition or predation are excluding toads from some ponds. It's also possible that toads just occur naturally at low numbers in this area." She adds, "Canadian toad declines might also be caused by other factors, such as climate change, disease, UV-B radiation, contaminants or it could be a combination of these factors acting in synergy."

As Canadian toads are either extirpated from the park, or occur at such low abundance that detection is extremely difficult, future work will concentrate on understanding the habitat needs of western toads in the Beaverhills, and the interaction of these two toad species in the boreal fringe area, where Canadian and western toads co-occur and are still relatively abundant. Potential study sites for 2004 include the area surrounding Utikima Lake; sites around Lac La Biche will be examined in 2005/2006.

During the 2004 field season, Browne and the other researchers will survey ponds more frequently to identify critical habitat features for toads in the aspen parkland, but also to locate adult western toads for radio tracking. Twelve toads will be tracked throughout the summer and during the winter until they emerge from hibernation in the spring. This will provide important data on habitat use, movement, home range size, and location of wintering sites.

Browne is optimistic about the potential benefits of her research. "We hope to provide data on the basic biology of toads in areas of both the aspen parkland and the boreal fringe, as well as possible insights into the interactions between western and Canadian toads in both regions and their response to habitat disturbance. We also hope to use the western toad as a model for developing proactive conservation strategies for amphibian species that still have healthy populations in Alberta. These strategies could be applied broadly including wetlands managed by the Alberta NAWMP Partnership, both now and in the future.

For more information contact Connie Browne at: cbrowne@ualberta.ca

Young-of-the-year Canadian toad
(Courtesy Corey De La Mare)

The western toad is considered "a species of special concern" in Canada and listed as "sensitive" in Alberta because it has suffered population declines and extirpations in the northwestern USA. The Canadian toad, while not considered at risk nationally because stable populations of this species exist in Saskatchewan and Manitoba, has been assigned the ranking of "may be at risk" in Alberta, and has been the subject of NAWMP-supported research since 2002.

Canadian and western toads are not freeze-tolerant like wood and chorus frogs. Instead they need to get below the frost line to hibernate (up to 1.3 m below the surface!). Therefore, in addition to suitable breeding and forage habitat, these toads require burrows to get below the frost line or loose sandy soil for digging hibernacula.

Toad Trivia: Did you know that western toads in most of the mainland United States, B.C. and Alaska don't call, but the ones in Alberta and California do? Researchers are looking for explanations of this behaviour.

More on

Waterbird Conservation Plan

waterbird conservation will need to be applied strategically. Reliable, comprehensive population information that considers wetland availability and other landscape features is the most pressing need. In addition, factors affecting waterbird survival and productivity, and information on how waterbirds respond to management treatments, and natural and human-induced environmental changes is required.

"Although the list of our data needs may seem overwhelming, we do have information on waterbirds—it's just that we don't have *enough* information, and time is marching on," contends Gerry Beyersbergen, a biologist with the Canadian Wildlife Service and co-lead in the development of the waterbird conservation plan.

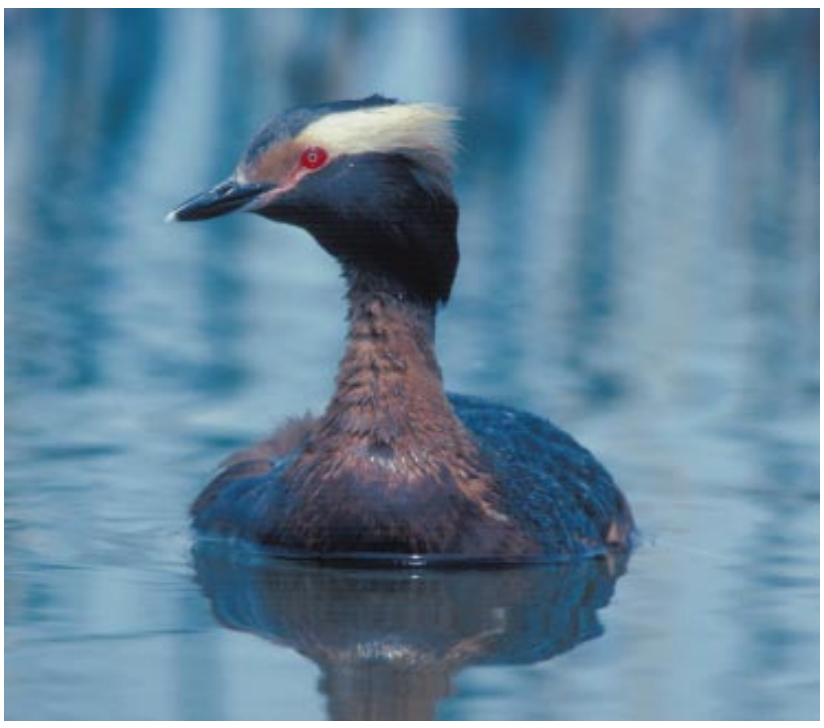
"Members of the Alberta NAWMP Partnership (ANP) have been very helpful, providing all the information they had on waterbirds and participating in the development of the plan. The ANP Biodiversity Fund also provided support for collecting key information for the plan, including an inventory of a large number of existing waterbird sites. The significance of the plan itself is that it provides a summary of conservation issues and our knowledge of waterbirds—what we know, don't know and where we have to go from here."

Beyersbergen continues, "The other thing we're hoping the plan will accomplish is that it will act as a catalyst for increased action both for the purpose of gaining knowledge on waterbird ecological needs and for on-the-ground waterbird habitat conservation."

There is reason to be optimistic on this front. "Because many species of waterbirds and waterfowl have similar habitat needs, there will be numerous opportunities to link conservation actions for both bird groups. Specifically, the plan outlines a landscape approach to help integrate conservation planning for waterbirds with conservation planning for other species, particularly the extensive waterfowl conservation efforts already carried out in the Alberta portion of the Northern Prairie and Parkland Region by the Alberta NAWMP Partnership."

In as much as implementation of this plan will benefit waterbirds, it will also help promote the concept of 'all bird conservation' called for by NABCI. Beyersbergen concludes, "The future conservation of all our bird species, whether they are landbirds or wetland-dependent species, rests in our ability to take positive action in overlapping, priority habitat areas and to do this sooner rather than later. Not only will we be ensuring the sustainability of our bird species, but we'll be affecting a multitude of other wildlife species. Our efforts certainly won't be wasted and the benefits will be multiplied."

The development of this waterbird conservation plan was coordinated by Gerard W. Beyersbergen (CWS), Neal D. Neimuth (USFWS) and Michael R. Norton (CWS), with input from a number of Prairie Habitat and Prairie Pothole Joint Venture partners. For more information, contact Gerard Beyersbergen at: gerard.beyersbergen@ec.gc.ca



Horned grebes, a species of high concern, are solitary nesters, often utilizing small wetlands that are also attractive to breeding ducks. Their numbers may be dwindling or they may be using other ecoregions. More data are needed to confirm the status of this species and its ecological needs. (Courtesy G.W. Beyersbergen)

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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

Biodiversity Makes it Work
Newsletter Production
Editor: Brett Calverley,
Alberta NAWMP Coordinator
Writing & Design: Phoenix Consulting & Design