

RECOVERY

An Endangered Species Newsletter



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Botanical gardens aiding plant recovery

BY DAVID GALBRAITH

Once considered extirpated in Canada, the wood poppy (*Stylophorum diphyllum*) appears poised to make a comeback.

The diminutive yellow-flowering herb is still found in substantial numbers in the eastern and central U.S., from the Atlantic seaboard west to Wisconsin. But until 1987, when one stand was discovered in Ontario, it hadn't been seen in Canada for decades. Then, in 1992, a second stand was found, again in Ontario, which is considered the northern limits of the perennial's range.

Listed in 1993 as endangered in Canada, the wood poppy has attracted the attention of botanists at McMaster University and the Royal Botanical Gardens (RBG), both located in Hamilton, Ontario. The researchers recently tested samples of the Ontario populations of the poppy for genetic diversity. Fortunately, even the smaller of the two populations was found to harbour some genetic diversity, suggesting recovery is



PHOTO: DAVID GALBRAITH

The wood poppy, listed as endangered in Canada, is getting some help from McMaster University and the Royal Botanical Gardens.

possible.

The wood poppy is one of two plants on Canada's list of species at risk getting help from botanical gardens. The other is the red mulberry (*Morus rubra*), Canada's only native mulberry. The most northerly of the eight remaining red mulberry stands in Canada is found at the Royal Botanical Gardens. The plant was uplisted in 1999 from threatened to endangered on the national list. Currently, the list includes more plants than mammals, birds, or reptiles.

In addition to the RBG, Canadian researchers can turn to a network of botanical gardens and arboreta playing vital roles in endangered plant recovery. Some are run by provincial or municipal governments, others are asso-

ciated with universities or private institutions. Many of these programs include activities that support the aims of the Canadian Biodiversity Strategy. For example, the arboreta at the University of Guelph are engaged in several important plant conservation projects, including a seed bank for rare and endangered trees.

Les Jardins des Métis, on the south shore of the St. Lawrence River in Quebec, is developing gardens specifically for propagating rare and endangered plants. The project, which is being conducted in collaboration with Quebec's Ministry of the Environment, is focused on endangered plants of the St. Lawrence basin and estuary.

At the University of British Colum-

continued on page 4

Inside

Traditional knowledge	2
New role for zoos	3
Peregrine downlisted	
Nova Scotia law proclaimed	5
Linking recovery teams	6
Sage grouse in decline	8

The benefits of traditional knowledge

BY DEENA CLAYTON

Managing renewable resources in Canada's north offers unique challenges and requires unique strategies for success. The Gwich'in Renewable Resource Board (GRRB) is a co-management board established by the Gwich'in Comprehensive Land Claim Agreement in 1992, and is one of several such boards across Canada's north. The GRRB's mandate is to conserve and manage renewable resources within the Gwich'in Settlement Area in a sustainable manner for all Canadians. The mandate is achieved by using traditional knowledge and science to develop management strategies that prevent species from becoming endangered and allow for the recovery of threatened or endangered species.

Although traditional knowledge is known by many terms, it is simply an understanding of the environment that has been developed through a lifetime of experience and observation and is built upon generations of such understanding. Those best versed in traditional knowledge are elders. Particularly in the north, the current generation of elders has known a lifetime of living and surviving off the land. Their 'traditional' knowledge is not static. It is not an artifact of history, but an understanding that is continually modified and developed.

It is a study of the northern environment with a time-scale out of reach of western scientific study. This is one of the keys to its value.

Traditional knowledge, with its long history of development and its holistic, ecosystem approach, is the perfect complement to scientific research in understanding the north

The knowledge that Gwich'in elders have gained — monitoring changes in the environment each and every year over a lifetime — is par-

ticularly important for recognizing and evaluating species and spaces at risk in the north. Dolly Varden charr in the Rat River were identified by people in communities as a population at risk. Local elders and fishers assisted biologists in identifying the problem and provided background information on the species' seasonal movements, preferred habitat, and spawning areas. With this information, biologists worked with the community to further develop the scientific understanding of the population and to design effective management strategies. Without the traditional knowledge of local people, biologists may not have recognized this particular population as being at risk. Furthermore, without traditional knowledge the background research needed to understand the status of the existing population would have cost more money, taken more time, and may have been too little, too late.

Traditional knowledge, with its long history of development and its holistic, ecosystem approach, is the perfect complement to scientific research in understanding the north. The conservation values associated with Gwich'in traditional knowledge, the values associated with only taking what you need and leaving the remainder undisturbed, work together with the GRRB's mandate to conserve and manage resources sustainably in the area.

Unfortunately, few of the younger generation have lived a life on-the-land and few are learning from their elders. Elders are dying without sharing their knowledge. The GRRB has taken an active role in recording the knowledge of, and learning from, the Gwich'in elders. This knowledge is used in the management process to identify and aid in the recovery of species and spaces at risk. Using traditional knowledge encourages community support for recovery planning, while recording this knowledge will allow the GRRB to share it with young Gwich'in in the future.

Deena Clayton was formerly the Gwich'in Environmental Knowledge Coordinator for the Gwich'in Renewable Resource Board.

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The views expressed in this publication do not necessarily reflect the policies of Environment Canada.

The newsletter is also accessible at:
www.cws-scf.ec.gc.ca/es/recovery/archive.html



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An evolutionary process

Zoos find a new role in the conservation effort

BY BRIAN KEATING

Just a generation ago, zoos were little more than theme parks, opportunities to gawk at the wild and wonderful products of evolution.

But the last two or three decades have seen highly organized captive-breeding and inspirational educational programs replace entertainment as the *raison d'être* of many progressive zoological institutions. This evolution of purpose has been exciting to watch. But it is the most recent investments in conservation programs that have now elevated the modern zoo to new heights of purpose, specifically as a vital player in wildlife research and habitat preservation.

More and more zoos are using their high profiles and income generating potential to develop conservation programs both locally and internationally. Some of the larger zoos, including the major operations in London, Frankfurt and New York, have invested in a host of successful projects for the last century, but many mainstream zoological institutions in North America are just beginning to make the switch. The Calgary Zoo is one of those zoos.

The Conservation Fund was established in 1984 by the Calgary Zoological Society to support conservation projects in Canada and around the world. The fund relies on donations, proceeds generated by society programs such as an eco-tour travel program, honoraria from presentations, and the Conservation Endowment Fund.

One of the highest profile projects to receive annual support from this funding is the breeding, raising and release of whooping cranes, part of a joint Canada/U.S. recovery plan. Having reached a low of 15 birds in the 1940s, the bird's three captive flocks and one wild population now include over 300 individuals.

The Calgary Zoo's program is the only one focusing on whooping cranes in Canada. Ultimately, the goal is to re-



PHOTO: BRIAN KEATING

Canada's zoos are becoming increasingly active in the recovery of endangered species like the whooping crane.

lease young birds on a yearly basis into the wild. In November 1996, staff released three of the birds into a non-migratory flock that is being established in Florida. Two more were sent in 1998, while 1999 releases are looking promising.

As of late February 1999, the whooper population in Florida numbered 73, including six pairs, three of which started building nests this past spring. One pair even laid two eggs in early April – the first egg production from the six-year-old Florida reintroduction project. The cranes are not out of the proverbial woods yet, though. One unfortunate storm last fall is blamed for a 10 per cent drop in numbers in the migratory flock which flies between Canada and the United States. Still, the relative success of the crane recovery project is evidence that captive breeding and release to the wild can be important tools in a conservation action plan.

In 1999, the fund is also support-

ing fieldwork for the local Eastern Slopes Grizzly Project and research on the wolf-cattle predation problem in southwestern Alberta.

Further afield, the fund is investing in a chimpanzee study in the Budongo Forest in Uganda, the Jane Goodall Foundation in the Congo, a tree kangaroo field research project in Papua New Guinea, and habitat preservation work with snow leopards in Nepal. It is also funding an eco-tourism project in the hinterlands of Guyana in South America and strengthening ties with the Havana Zoo in Cuba with a month-long on-site education program.

Wildlife at risk of extinction stands to benefit greatly from these efforts. As illustrated by their conservation work, the Calgary Zoo and the industry at large is adding an increasingly significant and effective element to the recovery of species at risk, both in Canada and abroad.

Brian Keating is head of Conservation Outreach for the Calgary Zoological Society.

COSEWIC Update

Peregrine falcon on the rise

After many years of continuous recovery efforts, the peregrine falcon (*anatum*) was downlisted in 1999 from nationally endangered to threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

The falcon has recovered in the northern part of its range, though some uncertainty remains about the condition of reintroduced populations in southern Canada. Its numbers have improved thanks to recovery efforts that included a 1969 Canada-wide ban of DDT and 24 years of releasing captive-raised falcons into the wild. Experimental releases of captive-raised young began in 1975 in northern Alberta, and annual releases started in 1976. The last young from a captive-breeding facility in Wainwright, Alberta were released in 1996, the year the facility closed. But releases continue in British Columbia, Alberta and Ontario using captive-bred stock from other sources.

Overall, 88 species were assessed by COSEWIC at the April 1999 meeting, including 32 new species, bringing the total to 339, up from 307 in 1998. Since 1978, COSEWIC has considered the risk of extinction of more than 490 species.

(Note: Chris Shank, former chair of COSEWIC, has published a 21-year retrospective of COSEWIC in The Canadian Field-Naturalist, Vol. 113 Number 2, April-June 1999. Copies are available from: the business manager, Canadian Field Naturalist, Box 35069, Westgate P.O., Ottawa, Ontario, K1Z 1A2.)

Botanical gardens helping in recovery of species at risk

continued from page 1

At the British Columbia Botanical Garden, researchers are working closely with the B.C. Conservation Data Centre in Victoria on the status and propagation of rare plants in B.C.

To help expand the role of botanical gardens in species recovery efforts, the Botanical Conservation Network, a registered charity dedicated to encouraging the participation of botanical gardens in biodiversity programs, and the Royal Botanical Gardens are developing a national gene bank conservation program to protect the natural genetic diversity of rare and endangered native plants.

The program will consist of five regional centres, each one located at a botanical garden with a commitment to public education and conservation.

The collections will allow wildlife biologists to use plants that are locally-sourced to supplement existing populations. The gene bank will also en-

able researchers to access local genetic stock for studies into the causes of rarity. The RBG is currently developing a pilot phase, concentrating on several rare and endangered species within its 1,100 hectare properties.

The gene banks are key components of the Biodiversity Action Plan

for Botanical Gardens in Canada, which is being developed by the network and the RBG with support from Environment Canada.

David Galbraith is a part-time associate professor at McMaster University and coordinator of the Canadian Botanical Conservation Network.

Recovery celebrates ten years

In 1987, the American white pelican (*Pelecanus erythrorhynchos*) became the first-ever species to be removed from Canada's list of species at risk. Its removal made the pelican an ideal candidate to feature on the cover of the debut issue of *Recovery*, which rolled off the press in June of 1989.

In 1999, *Recovery* celebrates its ten-year anniversary, and a decade of publicizing the challenges and successes of recovering species at risk in Canada.

The newsletter was created as part of the Canadian Wildlife Service federal endangered species program, intended to give the national program "a unified profile for species at risk recovery nationally," said Chuck Dauphiné, national coordinator of endangered species.

The newsletter has grown in popularity and distribution. The initial publication run was 1,000 English and 400 French copies. The print run for the current issue (#14) was 5,000 English and 1,000 French copies. It was initially 16 pages in length and distributed annually. The newsletter now comes out three times a year at eight pages per issue. Recently, the publication went high-tech, and is now available on the Internet.

A model conference Assessing population viability analysis

BY KENT PRIOR

With the advent of user-friendly software, the popularity of population viability analysis (PVA) as a tool for modeling endangered species recovery has expanded greatly.

The University of California at Berkeley and the Western Section of The Wildlife Society recently sponsored a conference assessing PVA models in hopes of improving the way they are used in policy decision-making.

Conceptual problems unanswered

Several conceptual problems with PVAs remain unanswered. How should genetic information be incorporated? What can analyses of long-term population data teach us about PVA? What are the best approaches for incorporating uncertainty? How can we distinguish among models that yield vastly different results? If the models cannot produce accurate estimates of the likelihood of extinction, what should their role be in endangered species management?

Several insightful papers were delivered at the conference. Katherine Ralls of the Smithsonian Institution (Guidelines for Using PVA for Endangered Species Management) and Robert Lacy of the Chicago Zoological Society (Expanding PVA: Integrating Wildlife Population Biology Models with Models of Human Demographics, Economic Activities, Social Systems, and Other Processes that Impact Biodiversity Conservation) presented particularly insightful submissions.

UBC mathematician Donald Ludwig (Fitting PVA into Adaptive Management) presented a paper that stressed how PVA can be used to enable managers to adapt their practices to new conditions. Abstracts can be found at www.cccweb.com/tws-west/pva.

Kent Prior is a species at risk specialist and data management coordinator for the Canadian Wildlife Service.

Nova Scotia law proclaimed

The Nova Scotia *Endangered Species Act* passed third reading of the Legislative Assembly in December, 1998, and was proclaimed May 1st, 1999. The Department of Natural Resources is now working on the process of appointing the Species at Risk Working Group that will determine which species will be listed under the Act. The Act features an independent science listing process and provisions that enable the government to protect habitat on Crown and private lands, said Sherman Boates, manager of the department's biodiversity program. As well, it provides for the possibility of compensating landowners directly affected by endangered species recovery programs. The passing of this new legislation provides the province with legal tools to protect endangered species, an objective of the Accord for the Protection of Species at Risk approved-in-principle by federal, provincial and territorial wildlife ministers in 1996. (Text of the new law is available at <http://www.gov.ns.ca/natr/WILDLIFE/web/actregs.htm>).

ESRF Update

Highest-ever number of projects approved

The Endangered Species Recovery Fund (ESRF) is helping finance 55 projects in 1999, the highest number ever to be funded in a single year. In April, ESRF sponsors Environment Canada and the World Wildlife Fund approved over \$725,000 of funding for specific projects.

In 1999, ESRF enjoyed a substantial funding increase over previous years, thanks in part to a generous grant from the federal government's Millennium Fund. The Millennium Fund committed \$208,000 a year for three years, with the money earmarked for recovery projects and plans. This amount, which significantly supplements Environment Canada's contribution, was matched by the World Wildlife Fund.

Since 1988, the ESRF has provided over \$3.7 million in grants to projects on species at risk. All applicants must obtain at least half their funding from another source. To date, under the program more than \$9 million dollars has been collectively invested in species at risk conservation projects.

RENEW Update

The strategy on the REcovery of Nationally Endangered Wildlife (RENEW) was approved in 1988. Over the past 11 years, RENEW program activities have focused primarily on the protection and recovery of extirpated, endangered, and threatened terrestrial vertebrates, which include mammals, birds, reptiles and amphibians. The scope of activities is expanding and now includes an ecosystem recovery team (South Okanagan Ecosystem), and teams for plants (Red mulberry; and Fernald's braya/Long's braya). A total of 33 recovery teams are in place covering 39 species. 16 recovery plans are approved, and five are undergoing jurisdictional approvals (Acadian flycatcher/hooded warbler, King rail, Vancouver Island marmot, Eastern massasauga rattlesnake and Kirtland's warbler). Of the 16 approved plans, five are being revised (Piping plover, Marten (Nfld. pop.), Roseate Tern, Peregrine Falcon (anatum) and Loggerhead shrike (Eastern team). 14 new plans covering 17 COSEWIC species are being developed, including two new species (Ginseng and American Chestnut). The RENEW 1998-99 annual report is available in print or on the Internet at: www.cws-scf.ec.gc.ca/es/renew/index_e.html.

Web-based project links recovery teams

BY JOHN SORRELL

Multi-agency projects are becoming common in today's workplace. But the wide distances between these agencies can hamper their collaborative efforts.

The National Recovery Team for the eastern massasauga rattlesnake (*Sistrurus c. catenatus*) is embracing a new tool to overcome the challenges inherent to multi-agency working groups. It's called the Sistrurus Information Network (SIN).

The initial need for an Internet-based communication system was identified in the communication strategy of the draft national recovery plan. The system's purpose, as set out in the strategy, is to ensure smooth information flow among team members, working groups, and their U.S. counterparts. It is also to offer a secure data archive system to disseminate monitoring data, landowner survey results, reports, and funding notices. The needs of the recovery team are greater than a simple website can support.

The Sistrurus Information Network (SIN) is an advanced web-based re-

While the Sistrurus Information Network (SIN) has begun to build its database, its future depends on the contributions of material from recovery teams

source that has powerful collaborative tools incorporated into its design. Following a convergence philosophy, the online resources were built to interface with standard fourth-generation web browsers (version 4.0 releases). These Java-enabled browsers allow for powerful programs to be run over conventional Internet connections using Pentium computers. They offer the power of advanced networks but without the need for complicated software add-ons or the downloading of personal

files. SIN users can also make use of collective resources at a colleagues' computer, at home or in the field.

For an example of how the massasauga team uses the system, the team has been asked to comment on a development proposal on the Bruce Peninsula. By posting the environmental assessment on SIN, the document is readily available to all members of the recovery team for comment.

Without SIN, the document would have to either be copied and sent through the mail or sent by electronic mail, which risks software incompatibilities. This kind of ready availability and warehousing of material applies to all kinds of documents and data and is likely a common issue among recovery teams.

The network is also a social tool, designed to bring people and their knowledge together, using the latest technology tools. But there is no point in introducing a technology if it doesn't suit the users' needs. Individuals must still provide the leadership, imagination and determination if information technology is to assist multi-agency projects.

While the Sistrurus Information Network (SIN) has begun to build its database, its future depends on the contributions of material from recovery teams.

The Eastern Massasauga Recovery Team, for one, is enthusiastic about its progress and invites you to log on, review and contribute to the Sistrurus Information Network (www.terra-plex.com/sin).

John Sorrell is the director of Terra-Plex Innovations Inc., an information technology firm dedicated to the support and advancement of natural heritage projects.

A new web-based system is creating innovative ways for agencies cooperating in endangered species recovery to communicate.



IMAGE COURTESY TERRA-PLEX INNOVATIONS 1999

Small, white and fragile

Government and private agencies monitor rare orchid

BY ELIZABETH PUNTER

Come late spring and early summer, the Manitoba prairies are seas of yellow. In a few places, you might find the small white lady's-slipper among the golden alexanders, common lousewort, and groundsels.

Small white lady's-slipper (*Cypripedium candidum*) is a perennial orchid often found in clumps of several stems up to 35 cm tall, sheathed by two to four leaves. A leaf-like green bract surrounds the flower with its distinctive white slipper, a petal modified into a pouch-like structure about 2.5 cm long, often spotted or streaked with purple. The other two petals are a twisted, greenish-yellow tinged with brown or purple, on either side of the slipper. A sepal, twisted and similar in colour to the lateral petals, extends upwards above the slipper. Two fused sepals similar in colour to the other project downwards.

In North America, the small white lady's-slipper occurs from the eastern seaboard to Nebraska and from Manitoba south to Missouri. It is found in southwestern Ontario, in Manitoba's southeast, the southern Interlake area, and the Brandon area, in prairies, openings amongst aspen groves, or prairie remnants along roadsides.

The small white lady's-slipper is now rare throughout its range and no longer grows in Saskatchewan, largely as a result of the conversion of native prairies to cropland. In 1981, the Committee on the Status of Endangered Wildlife in Canada declared this plant endangered. In 1992, it was placed on the endangered list under the Manitoba Endangered Species Act.

In Manitoba, flowering occurs from late May to early June. The flowers are insect-pollinated, though by which species is unknown. Elsewhere, pollinators are small andrenid and halictine bees. A



PHOTO: ELIZABETH PUNTER

Largely due to conversion of native prairies to cropland, the small white lady's-slipper is now rare throughout its range in Canada.

low percentage of flowers set seed, which are shed by late July. Seed production is further reduced by cool temperatures during flowering time.

Since 1993, staff with the Tall Grass Prairie Preserve in Manitoba have annually monitored the preserve's small white lady's-slipper populations. Non-government agencies and Crown corporations own parcels of lands that collectively make up the preserve. Elsewhere, non-government agencies monitor two populations annually and some others less often. Site managers carry out controlled burns to remove thatch and woody vegetation.

Recently, a piece of land containing a small population of small white lady's-slippers changed hands. It is the only known site between the Tall Grass Prairie Preserve and the Interlake region to the northwest and Brandon to the west, a distance of 140 km and 240 km respectively. Researchers have carried out

population counts there for several years. The new landowner, during a fence-maintenance operation in early September, removed sod from part of the site. After discovering the mishap, Manitoba Natural Resources replaced the sod. Small white lady's-slippers will be monitored at this site for the next few years to provide information on the effect of this damage to the population, its ability to recover, and whether such site restoration is plausible in the long-term.

Manitoba passed conservation agreement legislation in July 1998, encouraging landowners and agencies to co-manage rare species on private land. Such activities are needed if critical habitats are to be maintained throughout the range of rare species within the province.

Elizabeth Punter is the Special Projects Botanist for the Manitoba Conservation Data Centre.

Sage grouse continue to decline

BY CAMERON L. ALDRIDGE

Sage grouse once roamed British Columbia, Alberta, Saskatchewan, and 16 U.S. states. Today, they are extirpated from British Columbia, and five of the states. In Canada, the birds are at the northern edge of their range, and presently occupy about 6,000 square kilometres in southeastern Alberta and southwestern Saskatchewan.

Historically, the prairie range of sage grouse (*Centrocercus urophasianus urophasianus*) was about 100,000 square kilometres, likely overlapping with the historic range of sagebrush. The range contraction seen throughout North America is likely linked to habitat loss due to cultivation, grazing by domestic livestock, and conversion to grasslands. Most of the remaining habitat is divided or fragmented by the presence of ranches or farms, roads, fences, power lines, and energy developments.

Population at all-time low

Surveys of leks (grouse mating grounds) indicate that the Canadian population declined by 90% over the last 10 to 15 years to an all-time low of between 513 and 849 individuals in 1997, although the mild winter of 1997-98 resulted in a small population rebound. The Committee on the Status of Endangered Wildlife in Canada added the prairie population to its endangered list in April 1998. (The British Columbia population was listed as extirpated in 1997). When compared with the 1998 range-wide sage grouse population estimate of 157,000 birds, the Canadian population represents less than 1% of all remaining sage grouse.

The recent decline could be due to many factors. The major species of sagebrush in Canada is silver sage, which is not as tall or shrubby as big sagebrush, the dominant species found throughout most of the North American range of sage grouse. In Alberta,



PHOTO: CAMERON ALDRIDGE

Research is underway into causes of sage grouse decline.

increased grazing pressure may also be degrading the remaining habitat.

Oil and gas exploration and extraction is widespread within the Canadian range of sage grouse, while power lines to these sites and homesteads are abundant and provide excellent perching sites for golden eagles and other predators. The droughts of 1984 and 1987 and the heavy snowfall of 1996-97 could also have proved extremely difficult for sage grouse. Some predators, such as the coyote and the raccoon, have been increasing on the prairies, and they may be taking large numbers of sage grouse, especially hens that may not have enough cover to obscure their nests.

Research sponsored by a variety of private and government agencies is underway to sort out the possible causes. Radio telemetry will be used to monitor habitat use, nest site selection, survival and reproductive success. In the spring of 1998, several grouse were trapped and fitted with radio transmitters. The resulting nest data put clutch

size at an average of eight eggs, which is within the average for sage grouse throughout their range, but only 40% of nests were successful in hatching an egg.

In the future, in order to identify potential habitat limitations, data from intensive vegetation analyses of 72 summer roosting sites will be compared with habitat availability in the area and habitat use by sage grouse in other stable populations.

Cameron Aldridge is a Master's student of ecology in the Department of Biology at the University of Regina. He has been working with sage grouse since the spring of 1997.

A sage grouse recovery team for the Prairie population has been formed with representation from a very broad cross-section of stakeholders in Alberta and Saskatchewan. The team is following the general structure and format of previous RENEW recovery plans in the development of a sage grouse recovery plan.

- RENEW Report #9, 1998-99