BIOS

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The Nature Audit

In May 2003, World Wildlife Fund - Canada (WWFC) released "**The Nature Audit**" - a report of the state of Canada's efforts to conserve biodiversity and impacts on biodiversity over the past centuries. With the assistance of scientific experts, WWFC recreated a coarse scaled version of Canada's natural history accounts that provide an approximate benchmark and still give a strong signal of the degree of change ecosystems and species have undergone.

Financial audits are an accounting of 1) increases or decreases of a commodity over a given timeframe (the baseline to present); and, 2) deviations from budgeted predictions (the forecast or 'bottom line').

But in the biological world, it's difficult to examine either of these, especially when trying to estimate changes in biodiversity over a long period of time. Aside from the challenges of characterizing 'capital', there is often a lack of good information on historical or baseline accounts. This makes it difficult to draw comparisons to the current situation. In view of this lack of historical accounting, WWFC was left with a choice: restrict **The Nature Audit** to a relatively short time period, where complete data would be more readily available or to go back further in time. The WWFC opted to use the second option, since it offers the possibility of informing Canadians of the full scale of change that has occurred since European explorers first arrived on the continent.

Ultimately, the purpose of **The Nature Audit** is to help set a conservation agenda for Canada in the 21st century, based on an understanding of history, the patterns of change and the different trajectories of change being experienced regionally across the country. Not knowing the true scale of change can mislead us as to the true extent of long-term cumulative changes, perhaps more importantly, it can limit our ability to see future possibilities.

> "the purpose of The Nature Audit is to help set a conservation agenda"

Setting the Opening Balance

The Nature Audit estimates habitat baseline in Canada circa 1500-1600. WWFC developed this historical landcover map by combining existing historical vegetation accounts, topographical modeling and potential vegetation mapping together with current landcover mapping for those parts of Canada least disrupted by human activity. This reconstruction of major habitat types coarsely reflects the general distribution of forests, grasslands, major wetlands, and Arctic vegetation communities prior to European settlement.

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BIOS is written for the enjoyment of the members of the Alberta Society of Professional Biologists and those interested in the field of professional biology. Articles or comments are welcomed and should be communicated to the ASPB Office. Editing and layout by Gavin More, 49 NORTH Creative Learning and Training.

WELCOME NEW MEMBERS

Regular: Greg Eisler, Mark d'Entremont, Sarah Depoe, Shari Lynn Clare

Biologist In Training: Stephen Asamoah, Wayne Jackson

Membership Update

ASPB membership as of July 9, 2003: **Total 535**

Regular	437	Biologist in Training	46
Honorary	7	Temporary Withdrawn	27
Student	10	Public Member	1
Associated	4		

Meet the Board

Front Row (L to R) Gary Ash, Judy Bennett, Teresa de Grosbois, Christine Brown
Back Row (L to R) Henry Epp, Carol Engstrom, Robert Dallas, Maire Luoma, Bob Shelast, Stuart Ross

Bioprospecting

The search among the genetic codes contained in living organisms for the development of chemical compounds of commercial value in agricultural, industrial or pharmaceutical applications.

From: P.A. Nunes and J.C. van den Bergh. 2001. Economic valuation of biodiversity: Sense or nonsense? Ecological Economics 39:203-222.

Submitted by Chris Powter P. Biol.

President's Message

Another Board has begun its tenure for the ASPB, and while the faces may change with time, the mandate remains the same. Last year, about this time, the Board of Directors undertook a visioning exercise to land the priorities of the society. The new Board has agreed to carry on the priorities established in that exercise for another term. Namely, to continue the work that is ongoing in governance, competency, membership and membership services.

Having said that, there is also recognition that our society does not have sufficient resources at its disposal to hire the help it needs to pursue all of the priorities. While we have greatly benefited from the enthusiastic and diligent efforts of our part-time Executive Director (many thanks Robin!), our wish-list far exceeds our resources. As a result, we agreed to find ways to increase our financial resources to improve the overall "horse power" of our society.

A snapshot of the work we are continuing includes:

Governance

- Develop an action plan and privacy policy to comply with new **Personal Information Protection and Electronic Documents Act**
- Continue to monitor and plan for **Alberta Self-Governing Professions Review**
- Continue professional liaison with other professional societies,
- Consider formation of an "umbrella group" with similar professional societies to address changes to the Professional and Occupational Associations Registrations Act
- Investigate new ways of increasing the Society's financial resources
- Continue work on by-laws to clarify the use of the 'P. Biol.' designation

Membership

- Review registration practices and criteria for Society applicants
- Continue liaison with Alberta universities (including review of educational standards and executive director presentations to universities)
- Continue to explore options for re-establishing scholarships at Alberta Universities

Membership Services

- Continue development and maintenance of web site
- Establish 5 Year Conservation Research Scholarship partnership with Calgary Zoo
- Continue email bulletin and regular BIOS editions

Professional Development

- Continue Calgary and Edmonton Professional Development presentations
- Deliver 2004 Annual Symposium (theme - Environmental Monitoring and Follow-up)
- Review proposed professional development system
- Continue development of Mentorship Program

Teresa de Grosbois P. Biol.
President 2003/04

Waking Up to Environmental Consciousness

Recently, the Canadian Centre for Pollution Prevention held a conference in Calgary and as Alberta Research Council's (ARC) Green Team coordinator, I was asked to make a presentation on the Edmonton's energy programs. This opportunity was very exciting because my real job is business bridge builder with companies in the Environmental sector and ARC engineers and scientists. The conference was attended by environmentalists, research organizations, government and businesses.

The caliber of the presentations was astounding. The presentations painted the standard picture. The quality of our air, water and energy sources are degrading and the quantity declining, which affects all living creatures.

It is easy to take for granted the many abundant natural resources we have in Canada, but it is important to be conscious of your impact on the environment and know that you will make a difference in keeping your community clean by making environmentally friendly decisions.

We as biologists need to be conscious and creatively inform our clients about the products we use and the garbage we create because each individual's pollution affects everyone around them. If we each did a little bit more as individuals and educated those around us, we can maybe change behaviour.

Stacey Schaub-Szabo M.Sc., P.Biol.

About the Green Team: Formed in 2000 when ARC staff of similar minds wanted to raise awareness of environmental issues and implement programs and awareness around the Millwoods Building. For more information write to greenteam@arc.ab.ca

Bios Bits

Guide to the Species at Risk Act

The Species at Risk Act (SARA) is being brought into force through a phased approach:

- 2002 SARA was passed by Parliament.
- 2003 Budget 2003 commited $33 million over two years for implementation of the Act. This amount is in addition to the $180 million allocated in Budget 2000.
- 2003 Sections 1, 134 to 136 and 138 to 141 of SARA came into force on March 24. Sections 2 to 31, 37 to 56, 62, 65 to 76, 78 to 84, 120 to 133 and 137 came into force on June 5,.
- The remaining sections 32 to 36, 57 to 61, 63, 64, 77, and 85 to 119 of the Act come into force on June 1, 2004

Download a pdf of the guide at www.sararegistry.gc.ca/the_act/SARA_guide_e.pdf

Pipeline Process Initiated

On June 18, 2003, Imperial Oil Resources, on behalf of the Mackenzie Gas Project proponents, announced that funding and participation agreements between the Producers, the Aboriginal Pipeline Group (APG) and TransCanada PipeLines Limited have been reached and the Preliminary Information Package (PIP) for the Mackenzie Gas Project is being submitted to relevant regulatory authorities.

Filing of the PIP is a key step in the process leading to the submission of applications for the development of the fields and pipeline facilities for the approximately $5-billion (Cdn.) Mackenzie Gas Project.

The Mackenzie Gas Project proponents are prepared to advance work to support filing regulatory applications in 2004. With regulatory and right-of-way approvals, followed by a potential decision to construct, gas production in excess of 800 million cubic feet a day could begin before the end of the decade.

The PIP is being submitted to the boards, committees and agencies responsible for assessing and regulating energy developments in the Northwest Territories, consistent with the June 2002 Cooperation Plan for the coordinated review process developed by the regulatory authorities.

Intended to assist regulators in finalizing arrangements for a coordinated regulatory review, the PIP includes preliminary information on environmental studies, public communication and consultation, the proposed pipeline route, size and capacity ranges, and developments for the Taglu, Parsons Lake and Niglintgak fields.

www.imperialoil.ca/Canada-English/News/News_Releases/N_NR_NewsRelease030618.asp

Royal Assent of Changes to CEAA

On June 11, 2003, the Canadian Environmental Assessment Act received Royal Assent.

The renewed legislation provides for more meaningful public participation and will deliver environmental assessments in a more certain, predictable and timely manner. The government has committed $51 million over five years to implement the improvements. These are expected to come into force in the fall of 2003 and include:

- adding a federal coordinator to assist departments and agencies in working together and with other jurisdictions;
- eliminating the possibility of referring the project to a review panel following a comprehensive study assessment;
- extending environmental assessment obligations to Crown corporations, beginning three years from the date of Royal Assent;
- providing with improved and up-to-date information on all federal environmental assessments through an Internet registry;
- increasing follow-up of assessments to ensure that sound mitigation measures are in place; and
- focusing resources on projects with adverse environmental effects and reducing the need to assess many smaller ones.

The Canadian Environmental Assessment Agency will play a stronger role in promoting and monitoring compliance of the renewed Act. The Agency will also put a greater focus on the quality of assessments.

Additional opportunities for public participation will help Canadians contribute to assessments taking place on proposed projects in their area.

A new Internet registry will make it easier for Canadians to get the essential, timely information needed to participate.

Participant funding, currently available for review panels, will now extend to comprehensive study assessments.

The legislation will also better incorporate Aboriginal perspectives into environmental assessments, including the formal recognition of traditional knowledge.

This news release, along with related background material, is available at: www.ceaa-acee.gc.ca

Soper Award

The J. Dewey Soper Award is given periodically by ASPB to a Canadian biologist who has made significant contributions to the field of biology. This is awarded in memory of Dr. Soper, who was highly regarded for his role in the development of biology in western and northern Canada.

Past recipients of the Soper award have included Dr. Stu Smith, Dr. Ian McTaggart-Cowan, Richard Fyfe, Dr. Valerius Geist, Dr. Stephen Herrero, Dr. Charley Bird and Dr. Geoff Holroyd.

This year's recipient, Dr. Joe Nelson, Professor Emeritus of Biological Sciences, University of Alberta, was selected by the ASPB board. Dr. Nelson is an internationally significant figure in the world of ichthyology and fisheries biology. Whether in the area of applied fisheries management or in fish taxonomy and classification, Joe has established a well-earned reputation for his professionalism. In addition to over 100 scientific articles, books, reviews, etc., he has been involved in an editorial capacity for four journals (Biological Abstracts, Canadian Journal of Zoology, Reviews in Fish Biology and Fisheries, Fish and Fisheries).

In publications about the biological diversity of the Earth's lakes, rivers, and oceans that Joe has authored or co-authored, he has been the first to describe and name 18 fish species and one genus. He has also developed an original species concept.

Much like Dewey Soper, Dr. Nelson has reached a broader public audience by publishing books that are fact-filled, but not overwhelming for the general reader. Joe's notable books, Fishes of Alberta and Fishes of the World, are in multiple editions and are highly regarded among public and scientists alike.

Joe is no stranger to the naturalist community, either. His articles on stickleback, post-glacial invasion of fishes, biodiversity and endangered fish habitat in the Alberta Naturalist are typical of his interest in communicating scientific concepts to a knowledgeable audience that can share his enthusiasm for Alberta's diversity.

He has played a major role in various professional scientific organizations, such as the Canadian Society of Zoologists and American Society of Ichthyologists and Herpetologists (ASIH). He has been Chair since 1991 of the American Fisheries Society/ASIH committee on the "Common and scientific names of fishes from the United States, Canada and Mexico."

Dr. Nelson has also been an active figure in the management of the academic world, serving as high as Associate Dean, Faculty of Science at the University of Alberta. Joe's association with Alberta and the University of Alberta has spanned over four decades, during which time he has served as mentor and colleague for countless biologists. He has supervised 29 graduate students, and continues to do so as a Professor Emeritus at U of Alberta. Several of these students have been or still are members of the Alberta Society of Professional Biologists.

Many of the undergraduate and graduate students that he has taught or supervised have gone on to perform as committed biologists themselves, many in the field of fisheries biology. A number of the members of the ASPB, upon hearing of the presentation of the Soper award, were very enthusiastic and declared that they count Dr. Nelson among the positive influences of their university careers.

Dave Ealey, P. Biol.

Peggy Thompson Publication Awards

This year's recipient of the scientific paper published in a refereed journal was Dr. Bhavin Rawal for his role in the article entitled "Capacity of *Irpex lacteus* and *Pleurotus ostreatus* for decolorization of chemically different dyes" published in the Journal of Biotechnology in 2001. This work was undertaken to establish whether there were practical applications of the terrestrial fungi to decolorize organic synthetic dyes under different physiological conditions.

Although his research was specifically designed to target problems in the European environment, such methods have wide applicability anywhere in Canada. Alberta is the jurisdiction with the highest number of brownfields (>10,000) out of a total of 20,000 to 30,000 for all of Canada, according to a 1996 report of the National Round Table on the Environment and the Economy.

This year's recipient of the award for a publication for the general public was Dr. Todd Zimmerling, of Applied Ecosystem Management Ltd., in Grande Prairie.

Todd's publication "Alberta handbook for planning and implementing works in and around a water body" was specifically written for project managers involved in dealing with federal and provincial agencies that oversee aquatic resources in Alberta.

With so much interest in water management and significant government efforts to bring forward strategies that address sound water management, any document that serves to clarify the complexities of this issue is particularly valuable.

Thanks to Gerry Haekel, Dr. Anne-Marie Anderson, Dr. Robin Leech and Lawrence Brusnyk for assistance in the review of submitted publications.

Dave Ealey, P. Biol.

The Nature Audit continued

Changes in the Accounts

The Nature Audit also graphically illustrates the extent of the human footprint and presents a regional look at how humans are impacting Canada's biodiversity. Kevin Kavanagh, WWFC Director of Biodiversity Conservation Reporting, and a team of scientists used a 'state-pressure-response' model to:

1) Measure the long-term changes in the abundance and distribution of 1,400 species and numerous habitats across Canada by comparing their current and historic states;

2) Estimate the human footprint or pressure (e.g., impacts attributable to pollution, urbanization, forestry, fisheries, aquaculture and other industrial activities) that Canadians are exerting on nature, including the critically important cumulative impacts these measures are having; and,

3) Audit what government, industry and others are doing to meet regional conservation needs in Canada - from protecting nature in advance of development, to restoring degraded habitats and preventing the arrival of invasive species, which can create significant economic and health costs.

The Findings

The first edition of The Nature Audit concluded that a multi-faceted conservation strategy emphasizing protection, management and restoration/recovery is needed in order for Canada's biodiversity conservation commitments to be met on a national scale. The bottom-line findings show:

- In northern lands and waters, Canada still has opportunities to conserve nature on a grand scale in advance of widespread industrial development, while helping to buffer against the effects of climate change and pollution from toxic chemicals. Time-limited opportunities exist in: northern British Columbia, southern Yukon, southern Northwest Territories, central Quebec and Labrador.
- Boreal forests are becoming increasingly impacted from the cumulative pressures of human use. Priority actions: 1) identify and protect intact forests needed to complete protected areas systems; 2) adopt industry best practices (especially in the forestry and oil and gas sectors) in the surrounding landscape. Priority areas: central and northern Alberta, central Saskatchewan, south-central Quebec and Newfoundland.
- Atlantic and Pacific waters are showing significant levels of pressure based on compounding activities such as fisheries, aquaculture, and energy development. Despite this, Canada's Marine Protected Areas (MPAs) system remains among the least developed in the world, and lags significantly behind our land-based system. Priority areas: Bay of Fundy, Gulf of St. Lawrence, the Scotian Shelf and the south coast of British Columbia.
- Habitat restoration in aid of species recovery must increase significantly. Priority areas: Lower Fraser Valley, BC; mixed grass and tallgrasss prairies, aspen parkland in Alberta, Saskatchewan and Manitoba; southern Ontario; the St. Lawrence Valley in Quebec, and; Prince Edward Island.
- Invasive species (costly, damaging and deadly) continue to arrive in Canada. Priority action: a national prevention plan, which must address the treatment of ballast water and provide adequate inspection of imported goods and their containers, two sources of recent introductions.
- Biodiversity-friendly industry standards, such as organic agriculture and Forest Stewardship Council certification, have been adopted on only a fraction of the Canadian landscape. Priority action: more leadership is needed from individuals and companies to voluntarily adopt and support these practices.
- Long-lived species with slow reproductive rates, from carnivores and whales to turtles and yellow cypress trees, are showing declines in almost all regions of Canada. Priority action: Develop and implement regional recovery strategies based on the needs of these species as a group.
- The slow pace of review and 'end-of-pipe' approach to regulation of thousands of toxic substances continue to threaten Canada's biodiversity. Reductions in the use of commercial chemicals and synthetic pesticides can best occur with the registration and adoption of alternatives and pollution prevention approaches. Priority areas: southern Ontario and Prince Edward Island.
- The biodiversity pressures associated with urban activities, such as pollution and sprawl, are increasingly having far-reaching negative impacts on biodiversity. Priority actions: implement measures to limit sprawl and support public transportation systems.

"a multi-faceted conservation strategy emphasizing protection, management and restoration/recovery is needed in order for Canada's biodiversity conservation commitments to be met on a national scale "

Source: Condensed from **The Nature Audit** Report No. 1 - 2003. World Wildlife Fund Canada, Toronto, Canada. (copyright owner)

Downloadable pdf files and an online interactive version of **The Nature Audit** are available on the WWF - Canada website www.wwf-canada.org/en/default.asp.

Edmonton Professional Development Committee

ASPB and AIA hosted David Lloyd at the Alberta Research Council (ARC) to give a seminar on the Upstream Oil and Gas Reclamation and Remediation Program Changes. Eighty nine people attended the seminar - WOW!! Was it the topic, the cafeteria in the building, the location ... I'm sure it was a combination.

Surprising results from the questions we asked:

1) One quarter of the audience were ASPB members, one third were agrologists and Canadian Land Reclamation Association members, and one eighth were APEGGA members.

2) Another surprise (which differs from the EPDC survey in March 2002) was that 95 percent of this audience found the lunch time session to be better than an after work session, independent of the topic.

3) One third of the participants found the south location for a seminar it better than the university and two thirds found it better than downtown. Still don't know where to hold the events??

Our EPDC committee is comprised of the following newly joined and enthusiastic members. Jenny Earle, Craig Harris, Ann Lukey, Beth Michener, Corey De La Mare, Rick Zolkiew (Chair), Stacey Schaub-Szabo (Treasurer). Please contact any of us with suggestions and ideas for events. We want to hear from you!

Have a great summer.

Stacey Schaub-Szabo M.Sc., P.Biol.
szabo@arc.ab.ca

Frog Mystery Solved

A noted biologist, who had been studying little green frogs in a swamp, was stumped. The frog population, despite efforts at predator control, was declining at an alarming rate. A chemist at a nearby college came up with a solution: The frogs, due to a chemical change in the swamp water, simply couldn't stay coupled long enough to reproduce successfully. The chemist then brewed up a new adhesive to assist the frogs' togetherness, which included one part sodium. It seems the little green frogs needed some monosodium glue to mate.

Submitted by Robin Leech, Executive Director

Edmonton Regional Science Fair and ASPB Award

This year's science fair took place April 12/13 at the Mayfield Trade Centre in Edmonton. About 120 projects, representing the efforts of over 200 students, were on display for the elementary school grades. Over 40 projects were checked for suitability for the ASPB award. Eight projects were judged through interviews with each student (or students) who had done the projects.

This year's winner was "Loops, Whorls and Arches?" by grade 5 students-Elise Hervieux, Monica Kulig and Asa Hagel, of Ecole Holy Cross School. The display clearly showed the background and basic information on fingerprinting. We discussed with the students about the value that they would have gained by displaying the charts of family relationships for the different groupings of ridge types for fingerprints of their test subjects. The students showed a good understanding of potential use of the fingerprint information.

An honorable mention was awarded for "To Rot or Not to Rot - Biodegradeability" by grade 4 student-Krystal Hilker, of Scott Robertson School. This decomposition experiment clearly demonstrated the greater amount of rotting that happens to organic material. The student showed a fair understanding of the need for moisture for effective decomposition and for the micro-organisms. Krystal presented predictable results and showed that it was confirming previously reported results. Her skills at presenting her project were quite notable.

Dave Ealey, P. Biol.

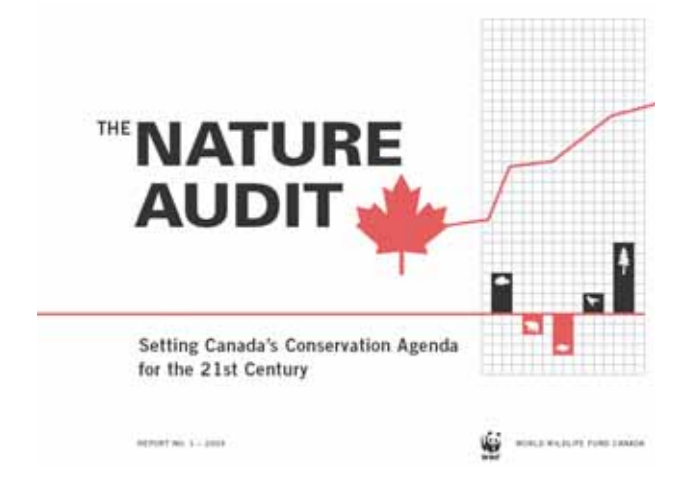
The Nature Audit: Selected Highlights

Arctic - The Arctic and its inhabitants are already feeling the impacts of long-distance pollution and global warming. Conservation measures should be put in place before development occurs.

Marine - Pressures are mounting on marine environments. In many cases, they are as impacted as land-based systems. Marine conservation efforts in Canada often lag far behind the rest of world. Canada has had poor performance in establishing a marine protected areas system.

Forests - Canada's boreal forests are increasingly under threat. Some forests have achieved Forest Stewardship Council-level certification, but only a fraction of the total.

Grasslands - These are the most impacted habitats in the country. Only 0.9% of Canada's native grassland and parkland regions have little or no human footprint. Large reserves of oil and gas attract widespread development, rivers have been dammed for irrigation, 'pest' species continue to be exterminated, and pesticides applied to crops work their way up the food chain. Fence lines, pipelines, croplands and roads have carved native grasslands into increasingly smaller fragments and ecological processes needed to sustain the prairie have been disrupted. These have significantly reduced or eliminated many species.



Mammals - Land and marine mammals have suffered marked losses in range and abundance in Canada. Of all species groups studied, mammals have suffered the highest proportion of regional losses. Some notable examples: eastern populations of wolverines, and prairie populations of bison, swift fox and grizzly bear.

Birds - Interior grassland and forest habitat birds show the greatest rates of decline. Habitat loss is a major contributing factor.

Reptiles and Amphibians - This species group shows widespread decline in southern Canada, where species diversity is highest. Almost 70% of reptile and 35% of amphibian regional populations are in decline. Habitat loss and pollution are contributing factors.

Marine & Freshwater Fishes - Among marine fish species, half of the regional occurrences exhibited a 20% or greater loss of abundance. Freshwater fishes also show disruption across much of Canada, in part from recreational fishing and invasive aquatic species.

Butterflies - Within Canada, more than 25% of butterfly species are showing a reduction of 20% or more in their range area. Twelve butterfly species have been lost from an entire region of the country.

Orchids - Orchids may be the most highly impacted species groups in Canada. Marked changes in range and abundance appear to have occurred in all but the most northerly regions of Canada. More than 80% of all regional occurrences of orchids show some level of disruption.

Trees - Trees in Canada face pressures from development and introduced diseases. The most significant declines have occurred where forest cover has been converted to other land uses, especially agriculture and urban development, or where 'conversion' forestry has been practiced on a large scale. Newly arriving invasive species (e.g., emerald ash borer, Asian long-horned beetle) have the potential to greatly impact maple, oak and ash trees in Canada.

Invasive Species - Invasive species are a serious threat to biodiversity. At least 1,500 invasive species have become established. Few regions of Canada are untouched by the effects of invasive species. Plants, animals and other organisms have entered Canada as stowaways on ships or in ballast water, hitched rides on trucks and planes, or hidden in imported materials. In addition to competing with natural species for habitats and food, invasive species also take a huge economic toll.

Source: Condensed from **The Nature Audit** Report No. 1 - 2003. World Wildlife Fund Canada, Toronto, Canada.