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THE CANADIAN SOCIETY OF ENVIRONMENTAL BIOLOGISTS Newsletter / Bulletin

In this Issue:

CSEB Newsletter Bulletin SCBE

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In this issue

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Front Cover: Matt Landgrebe of RC BioSolutions Ltd. completing a water quality profile on Tyrell Lake (southern Alberta) in February 2016. Photo credit: Richard Carson.

Back Cover, Top: Richard Carson of RC BioSolutions Ltd. doing bathymetry mapping on Black Nugget Lake (central Alberta) in late October 2015. Photo credit: Matt Landgrebe. Back Cover, Bottom: Matt Landgrebe of RC BioSolutions Ltd. completing a water quality profile on Tyrell Lake (southern Alberta) winter, 2016. Photo credit: Richard Carson.

CSEB NEWSLETTER 2017

Vol. 74, Number 4 Winter 2017

The Canadian Society of Environmental Biologists Newsletter is a quarterly publication. The Newsletter keeps members informed of the Society's activities and updates members on the current affairs and advances in the field of environmental biology. This publication draws together the widely diverse group of Canadian environmental biologists through a national exchange of ideas. Members are invited to contribute papers, photos or announcements that are of a national biological and environmental interest. Letters to the editor are welcome. This is a volunteer non-profit organization and we rely on your participation to make the newsletter a productive forum for ideas and discussion.

All business correspondence, changes of address, undeliverable copies and membership applications should be sent to: CSEB National Office, P.O. Box 962, Station F, Toronto, ON., M4Y 2N9. **Editorial correspondence: Gary Ash, Editor, e-mail:** garyash@shaw.ca.

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LE BULLETIN de la SCBE 2017

Vol. 74, Numéro 4 Hiver 2017

Le Bulletin de la SCBE est une publication trimestriel de la Société Canadienne des Biologistes de l'Environnement. Le Bulletin informe les membres des activité de la Société sur événements courant ainsi que les progrès qui font en sciences de l'environnement. Par un échange d'idées au niveau national, cette publication intéresse un groupe très diverssifié d'environnementalistes Canadien. Les membres sont invités a contribuer des articles, photos (noir et blanc) ou des messages qui sont d'intérêt nationale en sciences biologiques et environnementales. Les lettres à l'editeur sont bienvenues.

Tout la correspondence d'affaires, y compris les abonnements, les changements d'adresse, les exemplaires retournés et les formulaires: CSEB National Office, P.O.Box 962, Station F, Toronto, ON, M4Y 2N9. **Les lettres à l'editeur: Gary Ash, Editor, courriel:** garyash@shaw.ca

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The Canadian Society of Environmental Biologists

CSEB OBJECTIVES

The Canadian Society of Environmental Biologists (CSEB) is a national non-profit organization. Its primary objectives are:

- to further the conservation of Canadian natural resources.
- to ensure the prudent management of these resources so as to minimize environmental effects.
- to maintain high professional standards in education, research and management related to natural resources and the environment.

OBJECTIFS de la SOCIÉTÉ

La Société Canadienne des Biologistes de l'Environnement (SCBE) est une organisation nationale sans but lucratif. Ses objectifs premiers sont:

- de conserver les ressources naturelles canadiennes.
- d'assurer l'aménagement rationnel de ces ressources tout en minimisant les effets sur l'environnement.
- de maintenir des normes professionnels élevés en enseignement, recherche, et aménagement en relation avec la notion de durabilité des ressources naturelles et de l'environnement, et cela pour le bénéfice de la communauté.

NATIONAL News

PRESIDENT'S Report

By Anne Wilson, CSEB President

Greetings! 2017 is winding up, and my report for this past quarter will be brief, as I unfortunately have been off-line from regular activities for most of the fall.

In the fall teleconference meetings, there were good discussions on the idea of employing an advertising/publicity person to help raise the CSEB profile and attract members and interest. We have a great vehicle in the CSEB to connect biologists, and to give us a voice to raise concerns. If you have more ideas along this vein, please let me know.

I would encourage everyone to identify outstanding presenters who can be asked to participate in CSEB's webinar offerings – please send names to Loys at Tsolumresearch@gmail.com.

Our AGM will be held Feb. 28th, with elections and reports from the executive. Save the date!

In closing, I would like to wish each of you a very Merry Christmas, and all the very best for 2018. May you have a restful break during the holidays, enjoying the blessing of time with family and friends.

Upcoming CSEB Research Webinar

COMMUNITY-BASED CONSERVATION OF AN ARCTIC CHAR RUN IN NUNAVUT, CANADA

By Dr. Cameron Stevens, Senior Biologist at Golder Associates Ltd.

When: Jan. 11, 2018 at 1 PM Pacific, 2 PM Mtn, 4 PM Eastern

Abstract: The Coppermine Inuit are concerned about the current state of the Arctic Char fishery in the Coronation Gulf. Management of the fishery is confounded by the potential effects of climate change and some stocks may be more vulnerable to habitat changes than others. In 2012, the Kugluktuk Hunters and Trappers Organization (HTO) initiated a conservation program for a stock associated with Nulahugyuk Creek where Traditional Knowledge identified a run in decline. The status of the run was monitored over multiple years using a two-way trap net at the creek mouth. Annual data from up to 425 spawners described an upstream run with a unique movement window peaking in late spring and with movements continuing through July as stream conditions quickly deteriorate. Low flows and elevated water temperatures reduce migration success of fish navigating the naturally shallow, boulder-strewn creek. Less than 35% of migrants reach their spawning destination based on multiple years of PIT data. In 2012, the HTO tested the application of traditional rock weirs and instream engineering for extending the duration of suitable conditions for fish passage. Low-flow channels were constructed at five pinch-point locations where substrate was manipulated by hand to direct flows and fish. Post-manipulation water depth increased by up to 100% providing passage for fish. Five years later the low-flow channels remain intact and 13 other channels have been constructed. This community-based approach may provide a novel, cost-effective solution for increasing the productivity of the fishery.

Centre for Evidence-Based Conservation and Environmental Management

Carleton University

Evidence Call for Grey Literature

The Canadian Centre for Evidenced-Based Conservation and Environmental Management (CEBCEM) at Carleton University needs your help with three ongoing systematic reviews:

1. **What are the impacts of flow regime changes on fish productivity in temperate regions?**
2. **The effectiveness of spawning habitat creation or enhancement for substrate spawning temperate fish.**
3. **What are the consequences of fish entrainment and impingement associated with hydroelectric dams on fish productivity?**

What are we looking for:

The review team is sourcing key data on this topic in the form of:

- Unpublished academic research and theses
- Unpublished negative/non-significant results
- Consultancy or internal reports
- Government papers or policy documents
- Monitoring and evaluation data
- All other literature "that is produced on all levels of government, academics, business, and industry in print and electronic formats, but which is not controlled by commercial publishers" (4th International Conference on Grey Literature, 1999).

Get in touch:

If you can provide any grey literature (or relevant published material) on this subject, please send any information to dirk.a.algera@gmail.com by December 31, 2017.

CSEB Research Webinars

Check the CSEB Website at www.cseb-scbe.org for upcoming webinars and registration information.

REGIONAL News

BRITISH COLUMBIA News

Submitted by Loys Maingon, CSEB BC Director

Intractable Practical Questions

"The ordinary citizen assumes that science knows what makes the community clock tick; the scientist is equally sure he does not. He knows that the biotic mechanism is so complex that its workings may never be fully understood." – Aldo Leopold

BC has changed governments, but the main problems and the environmental concerns that previous governments generated remain unchanged. Over the past seven months the NDP/Green coalition has moved to address concerns with the grizzly trophy hunt, and they have begun discussions towards a re-assessment of the "professional reliance" model. The larger questions, which are tied to the economic model and the future of the province's energy needs regarding Site C and the Kinder Morgan pipeline, continue to be unresolved. They are part of a larger emerging global problem associated with climate change, and the growing concern with the impact of fossil fuels on the sustainability of the biosphere.

It is becoming increasing clear that in spite of the goodwill expressed at the Paris COP 21 in November 21 2015, no substantial progress has been made, even – and especially – by its most prominent supporters. In practical terms, this year's conference, Bonn COP23, has proven as ineffective at addressing a deteriorating global environmental situation as all its predecessors.[1] There are no effective binding commitments to address the central problem which remains: an unsustainable economic model based on endless growth and endless consumption. That the assumptions behind the 1987 Brundtland Report (*Our Common Future*) on sustainability that have governed economic and environmental thinking for the past three decades were either misleading or ill-founded is evident today by the outcomes detailed in a series of reports that have been released this fall. These reports detail everything from ocean warming, to insect collapses, to general species decline. Notably, after 25 years since the initial identification of a critical situation in the making, the "*World Scientists Warning to Humanity: A Second Notice"*, accentuates the failure to heed the first warning issued in 1992.[2] The gist of the 1992 warning is worth re-iterating:

"These concerned professionals called on humankind to curtail environmental destruction and cautioned that "a great change in our stewardship of the Earth and the life on it is required, if vast human misery is to be avoided." In their manifesto, they showed that humans were on a collision course with the natural world. They expressed concern about current, impending, or potential damage on planet Earth involving ozone depletion, freshwater availability, marine life depletion, ocean dead zones, forest loss, biodiversity destruction, climate change, and continued human population growth."[2]

That the 1992 warning has gone largely unheeded, and that the window of opportunity to re-dress an apparent failure and take serious action to curb our impacts is fast disappearing, is becoming an increasingly inescapable conclusion. On an almost weekly basis, reports from around the world continue to build a disturbing picture of a progressive dismantling of ecosystems. Just today we have the politically controversial conclusion of David Attenborough's career, from Attenborough himself, indicating that glossy naturalist programmes may have given the public an exceedingly false re-assurance of the human impact on a very fragile planet.[3]

The largely uncontrolled cumulative impacts of production and consumption, endless demands of a growing human population, the general resulting decline in freshwater and marine resources, the decline in vertebrate species and the correlated increase in atmospheric CO_2 and global temperatures, were predictable 50 years ago with *Limits to Growth*, forecast again 25 years ago and realized today. The series of graphs in Figure 1 from the second page of the 2017 *Warning to Humanity* leaves little doubt about the state of the planet, and where we seem to be headed.

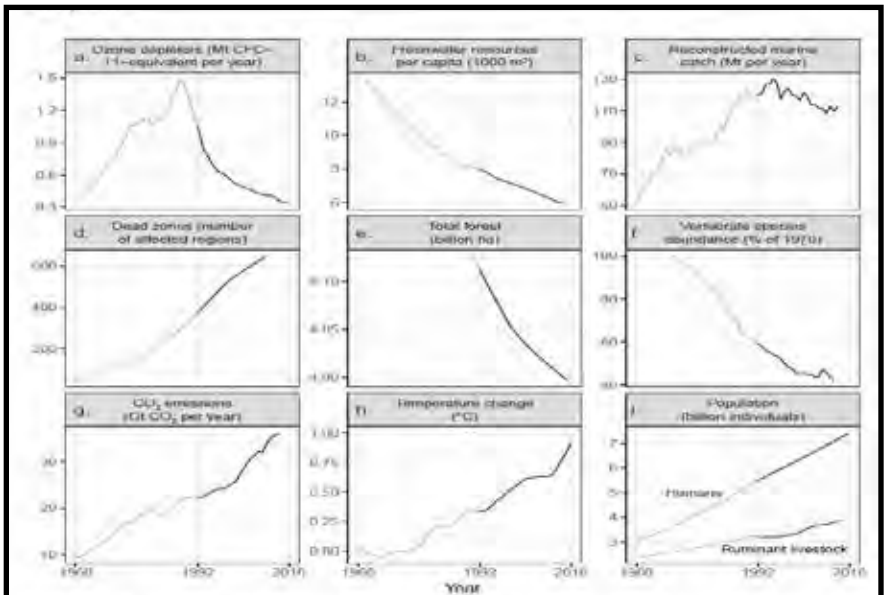

Figure 1. Trends over time for environmental issues identified in the 1992 scientists' warning to humanity. The years before and after the 1992 scientists' warning are shown as gray and black lines, respectively. Panel (a) shows emissions of halogen source gases, which deplete stratospheric ozone, assuming a constant natural emission rate of 0.11 Mt CFC-11-equivalent per year. In panel (c), marine catch has been going down since the mid-1990s, but at the same time, fishing effort has been going up (supplemental file S1). The vertebrate abundance index in panel (f) has been adjusted for taxonomic and geographic bias but incorporates relatively little data from developing countries, where there are the fewest studies; between 1970 and 2012, vertebrates declined by 58 percent, with freshwater, marine, and terrestrial populations declining by 81, 36, and 35 percent, respectively (file S1). Five-year means are shown in panel (h). In panel (i), ruminant livestock consist of domestic cattle, sheep, goats, and buffaloes. Note that y-axes do not start at zero, and it is important to inspect the data range when interpreting each graph. Percentage change, since 1992, for the variables in each panel are as follows: (a) −68.1%; (b) −26.1%; (c) −6.4%; (d) +75.3%; (e) −2.8%; (f) −28.9%; (g) +62.1%; (h) +0.67 °C; and (i) humans, +35.5%; ruminant livestock, +20.5%. Additional descriptions of the variables and trends, as well as sources for figure 1, are included in file S1.

It is in the context of our priorities that we need to weigh the so-called intractable questions of Site C and Kinder Morgan. *Can we really afford to continue to make the economy the determining factor in our decision-making?*

Although there is a commitment to resolve Site C's future by the end of December 2018, whatever decision is taken will be potentially fractious. It will pitch two opposing and irreconcilable visions of the reality about us and the resulting sets of values. This deserves discussion, because although pundits, politicians and journalists have extensively discussed the merits of these projects in economic and in general ecological terms, the real stumbling blocks are cultural and spiritual.

In this respect, perhaps the most significant legal decisions in BC since *Tsilhquot'in vs B.C.*(June 2014) have been the refusal of the Supreme Court of Canada to even hear the West Moberly and Prophet River Nations appeals against the construction of the Site C dam,[4] in late June of this year, which was followed by the extremely adverse ruling (November 1) against the Ktunaxa Nation with regards to the development of the Jumbo Ski Resort. This ruling came as a shock to many in the legal community. The ruling is extremely significant because it runs counter to *Tsilhquot'in*. It creates a precedent for the interpretation of *Tsilhquot'in* because it favours development and business interests over cultural interests. The Ktunaxa opposed development in the area of the proposed resort because they considered it to be a culturally essential sacred site. Seven of the nine judges ruled that "*In short, the Charter protects the freedom to worship, but does not protect the spiritual focal point of worship.*" [5] The logic is that, while the right to belief is protected, places essential to the maintenance of those beliefs are not. As is customary in legal decisions, the logic is cast as being "reasonable," and therefore seeks to align itself with "reason" and science.

This is extremely significant because, whereas New Zealand and Indian courts have granted rights of personhood (and therefore the "sanctity of personhood") to rivers,[6] and Bolivia and Peru have granted legal rights to Planet Earth,[7] Canadian courts are unwilling to accord spiritual standing to a place, let alone personhood. (For reasons that will be alluded to below, it is highly unlikely that the current configuration of the US Supreme Court would differ in opinion from the Canadian Supreme Court.) The essence of the *Jumbo Glacier Resort vs Ktunaxa Nation* is that economic rights trump cultural rights. It also explains why the Supreme Court refused to hear the Moberly and Prophet River Nations' appeals against the construction of Site C, presenting arguments on the basis of the cultural importance of the area to be flooded.

In this respect, the Supreme Court's decision in *Jumbo Glacier Resort vs Ktunaxa Nation* differs very little from President Trump's recent rollback of the Bear's Ears and Grand Escalante National Monuments, and the Arctic National Wildlife Refuge. In most of these cases, Mr. Trump has elected to disregard the cultural and spiritual concerns of First Nations residents who have petitioned for the preservation of spiritual sites that they deem to be culturally significant to their identity. In this regard, the rationale behind the Canadian Supreme Court's decision is no different from that of the Trump administration: spiritual and cultural identity must give way to economic lust.

For earth scientists and environmental biologists, the disturbing point in this decision should be that it was given under the cover of "reason" and "reasonableness."

It is extremely germane to this discussion to note that at the heart of the ongoing controversy in the United States, wilderness is also considered to be culturally and spiritually significant to non-aboriginal Western culture as a simple matter of "American heritage". And this is even more so as we come to place these concerns within the reality of the ongoing global biotic collapse. Letters opposing the opening of large areas of national monuments to economic development, by former secretaries of the interior, Bruce Babbitt and Sally Jewell,[8] to appeal for restraint and sanity have stressed the cultural and spiritual significance of these national site to the American people. Babbit is quite explicit:

> *"He is a vandal in our midst, coming in person to lay waste to the land. This theft of our heritage should awaken us to the damage being piled up across our public lands…"*

This has to be of concern to environmental scientists, because while what we do is riveted to the "scientific method," there is also a long-standing, if often unacknowledged, spiritual dimension to the science of ecology. Practitioners are always torn between the materialism of Gifford Pinchot and the spirituality of John Muir. Aldo Leopold, who is often touted as "the father of North-American ecology," always speaks of the soil as "an organism" and was always torn between the grandeur of evolution and grandeur of wilderness. Writing in *Sketches Here and There* between 1935 and 1946, he realized the threat to both evolution and wilderness values in the spectacle of economic depredation, which has only accelerated since:

> *"Ability to see the cultural value of wilderness boils down in the last analysis to intellectual humility. The shallow-minded modern who has lost his rootage in the land assumes that he has already discovered what is important; and it is such who prate of empires, political or economic, that will last a thousand years. It is only the scholar who appreciates that all history consists of successive excursions from a single starting point, to which man returns again and again to organize a durable scale of values. It is only the scholar who understands why the raw wilderness gives definition and meaning to the human enterprise."*[9]

Judgements like *Jumbo Glacier Resort vs Ktunaxa Nation*, really bring out the obligation to acknowledge the significance of cultural and spiritual dimensions in science. And, as Aldo Leopold indicated, that is a scholarly enterprise for which we no longer educate the scientists we train in universities.

Energy projects such as Site C, LNG development, and Kinder Morgan pose difficulties for core assumptions that characterize a nested complex of larger global cultural and economic narratives. Central to these problems is the tacit—if facile and erroneous assumption—that the world is just a collection of facts, and that the facts can be manipulated at will. The fallacy of this all-too-frequently held assumption was the concern of much of the writings of the late Karl Popper (1902-1994).

Cultural narratives create filters through which we collectively develop our regional visions of the reality about us. The world about us is a marvellously complex phenomenon that exceeds

our physiological perceptive capacities and the inherent limitations of our personal cultural baggage. These are areas of discussion for which scientists and not least of all, environmental scientists are largely unprepared, unless they have a background in cultural geography. Site C, LNG development and Kinder Morgan are practical economic questions which pose cultural and environmental problems, which can prove intractable, if we do not fully incorporate cultural, rather than strictly economic, considerations.

The consideration that the phenomenon exceeds our cognitive capacities is nothing new in the contemporary history and literature of science. In biology, we often appeal to J.B.S. Haldane's 1927 remark:

> *"I have no doubt that in reality the future will be vastly more surprising than anything I can imagine. Now my own suspicion is that the Universe is not only queerer than we suppose, but queerer than we can suppose."*[10]

As I recall from my previous life as a historian of science, it was Rabbi Akiba who put it best in a twelfth-century commentary of the Talmud. To paraphrase: he suggested that the Creation was like the Milky Way, a magnificent unfathomable assemblage in which each star contributes something essential. Each culture only gets a tiny fragment of the whole, and the only way to understand the whole is to respect each part. If only one part were to dominate, it would be like a desert sun and annihilate the diversity that makes the whole possible. If the Milky Way loses a star, it is forever lessened. Whether we want to listen to the twentieth century scientist or the twelfth-century mystic, the message is the same: humility and tolerance are cornerstones of science and spirituality, of reason and of wisdom.

Science and spirituality are products of cultures. As Karl Popper has argued, science is not just a collection of testable facts, it is a series of perspectives on the world that share a testable method of ascertaining facts or constants, all of which have to be falsifiable. (If it is not falsifiable, it is religion, not science!) To anyone who has lived in more than one language, or has had to translate and operate in different languages working with colleagues from different cultures, attitudes and interpretations vary between cultures. They enrich the learning experience, only if we take pleasure in learning. We share different approaches to a common reality. Largely because of their shared cultural origins, contrary to popular thinking, there is more in common between Western science and Western spiritual traditions than one might believe. In point of fact, one (science) has grown out of the other. As the terrific work that climatologist Dr. Katherine Hayhoe indicates, there may be less of a gulf between religion and science than one is often led to believe. Navigating tolerance and respect on both sides of a divide is always a productive experience.

We will all agree that we are all heirs of Newtonian science. With Newton, modern science came into being, and has dominated all our thinking, and reliance on the scientific method. It is Newton's description of gravitational forces that has put astronauts into space. Regrettably very few people have read the original text of Newton's *Philosphia Naturalis Principia Mathematica*. Since Latin is rarely taught to contemporary scientists, very few have access to this text. Yet, if every science student in North America had the ability to, and were required to provide a freelance translation of the first pages of *The Mathematical Principles of Natural Philosophy*, chances are that we might graduate more mystics than scientists. (And indeed we sometimes have in Einstein and Capra.) The introduction has alchemical overtones. Like Genesis, it struggles for words to bring order out of an initial chaos. As is well-known, Newton devoted the greater part of his life to alchemy. What is less well understood is that for Newton, science was not a pursuit separate from alchemy. Newton remained an alchemist throughout his long life. (A point that should best not concern astronauts about to blast off into space….)

As a matter of humility, it might behoove us to remember that physics and chemistry arose out of magical mystical traditions, just as botany, biology and ecology arose out of the "theory of signatures," which is the basis of traditional Chinese medicine which Western Science currently endeavours to accept, as Chinese cultural hegemony grows. Why Chinese traditional medicine should be considered respectable, while Western Medieval medicine and homeopathy are not, has more to do with economics and cultural acceptability than rationality or testability.

Practical questions become intractable when reason operates without wisdom. There is hubris in the recent "*World Scientists Warning to Humanity: A Second Notice*". As New Zealanders and other nations have recognized, even if we are unable to quantify it, the land has a spiritual dimension that antecedes its economic value and gives it personhood. Without that tacit recognition, we can only further exacerbate a process that is diminishing biodiversity as I write these words, and that is endangering life on this planet.

In BC, recognition of cultural priorities that conflict with economic intentions underlies almost all of our major environmental problems. The fish farm tenures on Vancouver Island and the Central Coast, which the NDP introduced in the 1990's under the Harcourt government, are currently being challenged by First Nations as part of their "territorial claims" with occupations of fish farms.[11] To understand the protest and the values that drive it, one really has to return to the legal process that shaped "territorial claims" in the *Delgamuukw vs British Columbia* (1997) decision. The decision brought into Canadian law new concepts of "property" and "territory", in which "spirituality" and "cultural significance" redefined the relation between cultural groups and geographical places. The issues determining the tenure are, therefore, not primarily governed by the science of aquaculture, or its ecological impact on wild salmon populations, for which we can find arguments on both sides, but by the spiritual dimension of the integrity of the territory, of which wild Pacific salmon are a part, and Atlantic salmon are not.

Similar considerations govern how First Nations view the impacts of development on caribou, the development of Site C, and the potential impacts of the Kinder Morgan pipeline, both through the territories it will cross and through the oceans that will be affected by tanker traffic. In all of this, the determining factor is whether one wishes to prioritize support for an unsustainable economic model, which appears to endanger this planet, or whether one wishes to endorse cultural and spiritual values that are largely at odds with the practices and everyday life of the postwar consumer society.

The contradictions inherent in these considerations are manifest in the recent 5-4 decision of the City of Saanich to rescind the EDPA (Environmental Development Permit Area).[12] The EDPA was perhaps Canada's most progressive development by-law. It was largely derived from the findings of the Canadian Garry oak ecosystem recovery team to protect one of Canada's most endangered ecosystems, and was, therefore, based on the soundest science available. Saanich is a core area and is home to many endangered species. Although only 5% of Saanich properties were within the EDPA, and 52% of the EDPA is on public land (parks), development restrictions on private property created a firestorm of opposition from developers and landowners inconvenienced by everything from development restrictions, to inconveniences posed by falling acorns and leaves, to covenants limiting property re-zoning to increase lucrative property sales. These same landowners, whose homes will be graced with the spirituality of First Nations art, have little regard for the spirituality of endangered species in their own backyards. It is really of note that Saanich, which voted Green and is represented by a Green MLA and a Green MP, is a focal point of opposition to fish farms and tanker traffic, and yet prioritizes economic opportunities over endangered species in its own backyards.

BC has yet to develop an "*Endangered Species Protection Act*," which both the Green Party and the NDP made a central promise in their campaigns. It is to be hoped that what was lost to economic interests, with the rescinding of a municipal by-law, will be re-introduced and re-enforced in a provincial act prioritizing cultural and spiritual values bolstered by sound science.

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ALBERTA News

Submitted by Brian Free, CSEB Member

In 2013, Lake Louise ski resort in Banff National Park cut down a stand of trees along a ski run to improve skier safety. However, this stand of trees included the endangered whitebark pine (*Pinus albicaulus*). The resort was charged under the *Species At Risk Act* and the *Canada National Parks Act* and in December this year, they pleaded guilty to the two charges. The fines have yet to be determined.

This tree is a five-needle pine that is found in many subalpine and treeline forests. It is classified as endangered under federal and Alberta legislation. About 56% of its global range is in Canada, in the mountainous regions of BC and Alberta. About 24% of its Canadian range is in Alberta. An interesting characteristic of this pine is its close relationship with Clark's Nutcracker, a striking bird of Alberta's high elevation forests. This pine relies on the Nutcracker for seed dispersal.

The four main threats to whitebark pine include the White Pine Blister Rust, climate change, fire/fire suppression, and Mountain Pine Beetle. The latter is affecting many of Alberta's mountain pine forests. And of course, human-activity is an ever-present threat, e.g. ski resorts.

Recently, the federal government has released a proposed restoration strategy for the whitebark pine. They are seeking public input, so interested CSEB members are encouraged to visit the government's website and provide comments by December 17. This will be close to the publication date for this newsletter,

https://www.registrelep-sararegistry.gc.ca/document/default_e.cfm?documentID=3184

Here's one other interesting note about government efforts to conserve the whitebark pine:

For 2017, the federal government has been running a "Whitebark Pine GeoCaching Challenge". There is a hidden cache in the sub-alpine of each of six mountain national parks in Alberta and B.C. If you visit three of these and get the code word from the cache, you'll receive a special commemorative whitebark pine coin. Check this out at:

https://www.pc.gc.ca/en/pn-np/ab/waterton/activ/experiences/geocachette-geocaching/~/media/7A5A444A29BC4FFCB9AEAE6E948BAFCD.ashx

This contest is meant to encourage Canadians to visit our national parks, explore the sub-alpine and learn more about this endangered tree. Quite a novel approach!

SASKATCHEWAN News

Submitted by Robert Stedwill, CSEB Saskatchewan Chapter Chair

Gleanings Found in the Papers and Websites in Saskatchewan

Greater Sage Grouse

Habitat for greater sage grouse is at a premium in Saskatchewan and Alberta, so much so that in 2013 the Canadian government proclaimed emergency protection of 1700 square kilometres in southeastern Alberta and southwestern Saskatchewan of provincially and federally controlled land.

It is apparent that this protection has done what it was supposed to do; protect habitat so that the birds can do their thing. Since 2014, the number of males of greater sage grouse has quadrupled from 20 birds in 2014 to nearly 80 birds in 2016.

Notable in southwestern Saskatchewan are Grasslands National Park (GNP) at 900 square kilometres and Old Man on His Back Prairie Heritage and Conservation Area at over 13 000 acres (53 square kilometres), the latter which is administered by the Nature Conservancy of Canada (NCC). Staff of the NCC have recently identified greater sage grouse in the Wideview Complex (1222 hectares) which is adjacent to GNP. The Wideview Complex was announced in March of this year, but this is the first survey of species that has been undertaken. Also found during the surveys were ten species that were either listed under the Species at Risk Act or assessed by COSEWIC. Threatened species included Sprague's pipit, loggerhead shrike and common night hawk.

Woodland Caribou

At the end of October the Government of Saskatchewan requested public feedback on a draft range plan for woodland caribou in the central portion of the province's Boreal Plain.

The boreal woodland caribou is listed as a "threatened" species under the federal *Species at Risk Act*. Under the Act the government is developing range plans. The current draft identifies objectives, measures, tools and targets to manage woodland caribou habitat to support healthy populations, while allowing industry to grow in a sustainable manner.

Research has found that caribou populations in the northern boreal range of Saskatchewan are among the most sustainable in Canada. Population numbers in the central Boreal Plain, however, are largely unknown. This range plan will help to better understand population numbers in this area.

The draft range plan is available for review at www.saskatchewan.ca/government/public-consultations up until December 29th of this year. Presumably, comments should be in by this time, or shortly thereafter.

MANITOBA News

Submitted by Robert Stedwill, CSEB Past President.

Gleanings Found in Manitoba Papers and Websites

Zebra Mussels (*Dreissena polymorpha*)

You will recall that I have reported on the zebra mussel situation in Manitoba over the last two summer seasons and it would appear that from reports in September of this year that the mussels have not spread to any new lakes. Of course, this is all depends on how vigilant boat owners and government inspectors are in assessing the suitability of boats entering new bodies of water.

Current bodies of water with sizable populations of zebra mussels are the Red River, Lake Winnipeg, and Cedar Lake, with the first mussels being detected in Lake Winnipeg in 2013.

Singush Lake in Duck Mountain Provincial Park was effectively quarantined in 2016 after zebra mussels turned up in a water sample. Day-use boaters, those most likely to spread invasive species from lake to lake, weren't allowed to launch boats on Singush this past summer. "So long as they don't remove and take their boats to other waterways, cottagers on the lake have been allowed to continue boating on the Singush", said Candace Parks, a provincial invasive species specialist with the province.

My own recent experiences with boat inspections have identified rigorous to nonexistent inspections in various jurisdictions, and until government agencies enforce inspections and cleanings, the spread of the mussels will only continue into other bodies of water, and neighbouring provinces and US states. Inspection of boats has increased significantly over last year (from 5000 to 8000), and boats have been turned away at the American border as the fall fishing season ramped up in Manitoba, with many Americans coming across the border to fish.

An interesting sidebar to the zebra mussel's invasion of Lake Winnipeg is the impact that zebra mussels will have on the current algae blooms in the lake. According to Parks the mussels "eat algae, but they're not just insatiable opportunists that will eat up just any algae. They're selective filter feeders and may not develop a taste for the toxic blue-green algae that are causing problems in Lake Winnipeg."

"Parks said zebra mussels might in some ways make the algal blooms worse on Lake Winnipeg in the long run. At the same time, the waters in some parts of the lake that have been gunked [sic] up with algal blooms in recent years appear to be clearing up, which Parks says could be attributed to the mussels changing eating habits."

Manitoba's Made-in-Manitoba Climate and Green Plan

The Manitoba government's Made-in-Manitoba Climate and Green Plan is built on the strategic pillars of climate, jobs, water and nature, and includes 16 keystones for priority action that will support Manitoba's economy and sustain the environment for future generations.

"The plan sets out a made-in-Manitoba approach to carbon pricing with a low and level price of $25 per tonne beginning during 2018. This is half the amount mandated by the federal government and it will give Manitoba the second-lowest carbon price in Canada by 2022.

Cumulative emissions are projected to drop by more than one megatonne over the next five years – 80,000 tonnes more than with the federal carbon tax. Additional greenhouse-gas reduction actions set out in the plan will reduce emissions by more than double the federal carbon tax alone." Manitoba is fortunate to have an electric power generation system which almost relies solely on hydroelectric generation.

"The plan confirms exemptions for agricultural emissions. The carbon levy will also not be applied to marked fuels used by farmers for their farming operations. Agricultural operations will also be able to contribute to carbon sequestration and offset trading systems to be established in Manitoba and other provinces.

Large industrial emitters will be able to reduce their emissions while having their competitiveness concerns addressed through an output based pricing system of performance standards, offsets and credit trading.

Manitobans are invited to give their views on the climate and green plan. An online survey is now open for Manitobans to make their choices on the made-in-Manitoba plan as well as carbon revenue recycling by investing in families, green growth, and climate adaptation. The survey is available at www.manitobaclimategreenplan.ca."

ONTARIO News

Submitted by Derrick Moggy, CSEB Ontario Director

Grassy Narrows Mercury Remediation

Earlier this year, the Ontario government committed to spend $85 million to clean up the mercury-contaminated Wabigoon River that has impacted the people of Grassy Narrows First Nation and nearby Whitedog First Nation for generations. This commitment will be devoted to the cost of the remediation, including the engineering design and implementation of remediation measures and long-term monitoring, and spent in partnership with First Nations through a collaborative governance model. The comprehensive remediation action plan will be based on the scientific fieldwork that is currently underway and in partnership with First Nations, and involve finding all contaminated sites that could be leaking mercury into the river. The province has already spent $2.5 million for sampling and analysis work to determine the extent of the mercury contamination and which remediation options may be most appropriate for each contamination site. The province will add another $2.7 million to support the ongoing pre-cleanup work.

Between 1962 and 1970, the paper plant in Dryden, Ont., then owned by Reed Paper, dumped 10 tonnes of mercury into the river about 100 kilometres upstream from Grassy Narrows. The mercury, a potent neurotoxin, contaminated the fish, which poisoned the people of Grassy Narrows and nearby Wabaseemoong (Whitedog) Independent Nations. The mercury contamination still plagues these Indigenous communities in northern Ontario. Recent findings have shown high levels of mercury in soil, fish and river sediment , which suggests the site of the mill is still leaking mercury, about 50 years on.

Ring of Fire

The Ontario government has committed to supporting the construction of a series of all-weather roads linking isolated First Nations in Northern Ontario with the province's highway system by 2019. The all-weather roads will be limited to Webequie, Marten Falls and Nibinamik First Nations, who have agreed to the construction of two roads as part of a $1-billion infrastructure commitment made by the Ontario government three years ago to open up the province's north.

The province will fund proposals to build an east-west road connecting Webequie and Nibinamik to the provincial highway system, as well as a north-south road connection to the Marten Falls First Nation. The partnership between the province, Webequie, Nibinamik and Marten Falls will also facilitate access to the Ring of Fire, a mineral-rich area in the James Bay lowlands, about 575 kilometres north of Thunder Bay. The communities are set to start environmental assessments in January and plan to break ground in 2019.

The Ring of Fire could be a national economic project at the same scale as Alberta's oil sands. The region could hold up to $60-billion in mineral deposits. However, companies have faced significant development hurdles, in particular infrastructure. Hundreds of kilometres of roads must be built over the muskeg to the area. Without the roads, there is no cost-effective way to get the minerals to market. Noront Resources, the largest remaining player, acquired its claims for only $20-million from Cliffs Natural Resources Inc. after that company pulled out in 2013. Noront chief executive Alan Coutts called the announcement "a major step forward that will re-energize development of the Ring of Fire region."

One of the communities, Marten Falls First Nation, is serviced by one airline only, with no service to any major centre like Thunder Bay. The winter roads used to bring in construction, fuel, and other heavy loads, are being impacted by climate change and this has shortened the season and brought new and increased hazards each year. Marten Falls views the access road as a means to food security and to improving housing, education and economic opportunities. However Marten Falls recognizes that the north-south route would provide access to the chromite deposits in Marten Falls' traditional lands. Marten Falls First Nation is determined that transportation planning for greater access to the Ring of Fire must be fully inclusive of the First Nations whose rights and interests will be impacted by transportation decisions. Marten Falls' decisions will be based on seven-generation and sound environmental stewardship principles.

Victor Diamond Mine Closure

De Beers has determined it's not economically viable to extend the life of its Victor Diamond mine in northern Ontario and will be shutting down the operation in early 2019. The company had interest in extending the mine's life, and was looking to process low-grade stockpiles and possibly developing a nearby deposit called Tango. De Beers will slowly start reducing as they

approach the mine closure in the first quarter of 2019. De Beers committed to ensuring an orderly closure and will look to find new opportunities for those working at the mine, including about 70 to 80 jobs in mine demolition and environmental monitoring. De Beers opened the Victor mine in 2008, where it produced nearly seven million carats to date. The mine sits about 90 kilometres west of Attawapiskat, and has about 350 De Beers employees.

ATLANTIC News

Submitted by Peter Wells, CSEB Atlantic Member

Forest Clearcutting in Nova Scotia - An Environmental Crisis

Nova Scotia is facing an environmental crisis – the extensive clearcutting of our forests. I heard two talks about this issue recently, one by the Forest Ecologist, Donna Crossland, of Parks Canada, and one by Scott Leslie, an independent nature photographer and writer. The issue of clearcutting has been in our news for many months. Sadly, wherever you drive or walk in the wilds of the province, you see more and more extensive areas of industrial clearcutting. This fall, the issue led to a march in downtown Halifax, with hundreds of people participating, hoping to bring attention to the environmental damage being done to our landscape, wildlife, and waterways.

The province's Acadian forests, or what remains of them, are being clear cut by industrial scale operations at an unprecedented rate, the wood being used for pulp (at our two remaining mills in NS), wood chips (exported to Asia), and biofuel (for local electricity generation). Donna Crossland pointed out the long -term consequences of what is occurring – the loss of ever having forests of middle age and old age trees, as the cutting takes place too frequently to allow mature trees to flourish (the trees being removed are young, small and immature); the compaction of the soil by the cutting machines, leading to long-term, probably permanent, damage to the soil structure, its organisms, and its nutrients; the immense loss of irreplaceable wildlife habitat; the impact of nutrient loss and water retention in the soils; and the aesthetic impact of forests being cut right to the edge of major highways and byways. This industrial scale deforestation is being supported by the provincial department of natural resources, a department essentially "in bed" with the industry; the primary decision maker used to work for the forest industry. There are only guidelines for clearcutting, not regulations, and it is apparent that even they are not being followed. Wherever you go, clear cuts are seen. They are especially visible from the air.

The ongoing deforestation is an uncontrolled environmental disaster, one that is changing the natural face of the province for generations or centuries to come. According to Crossland, the soil in these areas will not recover. The regenerating trees will always be small and with different tree species than normal in an undisturbed forest. The politicians are allowing this to happen, jobs and holding on to their elected seats being the primary rationale. Note that the Northern Pulp mill in Pictou County is owned by a foreign company, with ties to an Asian company known for environmental abuses; profits flow out of the province. Environmental biologists and others should learn the facts of what is occurring, and speak out forcefully. Get the facts at www.nsforestnotes.ca and www.forestryreview@novascotia.ca. We need your help. Write to the Provincial Premier and register a complaint or at the minimum, make an inquiry. This is an issue that CSEB should be involved in and where the Society's voice should be heard. If you care about our land, please become involved and be heard.

Author's Note: I am not a forestry expert. Please check out the facts for yourselves. Be sure to let your voice be heard. Also read Jamie Simpson's book, mentioned elsewhere in the CSEB Bulletin.

Other Nova Scotia Environmental Issues of Concern

- The pulp mill at Pictou, NS.
- Burning tires in cement plants.
- Harbour sewage pollution.

If you are interested in information on any of these issues, please contact Peter Wells at oceans2@ns.sympatico.ca or Patrick Stewart at enviroco@ns.sympatico.ca.

Upcoming Workshop

- The 12th BoFEP Bay of Fundy Science Workshop, May 9-12th, 2018. Truro, NS. Go to www.bofep.org for details.

Interesting Books for Winter Reading

1) Joan Baxter. 2017. The Mill: Fifty Years of Pulp and Protest. I have yet to read this book. But it is very much in the Nova Scotia news! According to the Amazon site, the book "explores the power that a single industry can wield. For fifty years, the pulp mill near Pictou in northern Nova Scotia has buoyed the local economy and found support from governments at all levels. But it has also pulped millions of acres of forests, spewed millions of tonnes of noxious" ...(not my words...) chemicals into the air and local waters. The waste treatment system for the mill's effluents has been a pond, formerly a natural coastal lagoon. Of course the pond was completely destroyed as a natural aquatic ecosystem. Now there is a plan to restore it, and instead pipe the effluents directly into the Northumberland Strait. This was described in the last issue of the CSEB Bulletin/Newsletter by Pat Stewart. What has happened since Pat's article is the publication of this book and an attempt to have a book signing locally, only to be cancelled due to threats and intimidation levelled at the author. I look forward to reading the book and following this issue more closely. In the early part of my career with Environment Canada, my toxicity evaluation section worked on pulp mill effluents and this plant in particular. Nothing has changed in approx. 50 years, a sad commentary on the lack of serious attention to industrial pollution in Nova Scotia, a province so desperate for jobs and industry that environment takes a back seat in political and corporate decision making.

2) Claire Elizabeth Campbell. 2017. Nature, Place and Story. Rethinking Historical Sites in Canada. McGill-Queens University Press. This book describes some of the network of historic sites across Canada. But the book is unusual - the author wonders about whether the sites influence our perception of the country in artificial ways, as they are selected on and described in a post-colonial (post-settlement) context, ignoring indigenous history for the most part. However, one exception that I am

familiar with is Kejimkujik National Park and Historic Site, where there has been a real effort to find a balance of recent and older histories. Perhaps you, the reader, know of other sites? If you like to travel and see Canada, the book might make a thoughtful companion, read to you as you cruise along to your next destination.

3) Jamie Simpson. 2014. Journeys Through Eastern Old-Growth Forests. A Narrative Guide. I have read parts of this book, especially Chapter 5 - A Visit to a Clearcut, A Promise for Change, A promise Unfulfilled. One learns a lot about what is left of old growth forests in Nova Scotia and the long-term damage done by the modern methods of clear cutting. It is an entirely depressing read. It backs up what one sees from driving the provincial roads, main and secondary, as clear cuts are everywhere and done without consideration of wildlife, buffers along water courses, and aesthetics. Essentially the province is being ruined. The book describes in detail where to find the last remaining stands (patches) of our Acadian forests. The main messages of the book were backed up this week in an impassioned lecture given by a Forestry specialist working at Parks Canada, but speaking on her own time and turf. More environmental biologists need to become engaged in the battle to retain our forests, and their irreplaceable biodiversity.

Recent Publication

The Gulfwatch contaminants monitoring program in the Gulf of Maine: Are its data being used for ocean protection, with special reference to Nova Scotia, Canada?

By Sarah D. Chamberlain, Peter G. Wells, and Bertrum H. MacDonald

Abstract

The Gulfwatch Contaminants Monitoring Program is part of the Canada-US, Gulf of Maine Council on the Marine Environment (GOMC). Programs monitoring legacy toxic substances, i.e., chemical contaminants, such as Gulfwatch, collect and analyse environmental samples (e.g., blue mussels), interpret the data, and report on chemical levels and trends (spatial and temporal) in coastal waters. This study explored the extent to which its extensive information (data, reports, papers) has been used broadly and by Nova Scotia, a GOMC member. A mixed-methods study was conducted, using quantitative and qualitative metrics. Citations to some Gulfwatch papers and analysis of use of the Gulfwatch website showed that its data and information were accessed, mostly by government departments. However, interviews revealed that the departments were not using the data to inform Nova Scotia provincial coastal policy or practices. Recommendations are presented to improve the visibility and use of information provided by long-term, environmental monitoring programs.

For a copy of the publication, please contact Peter Wells at oceans2@ns.sympatico.ca.

TERRITORIES News

Submitted by Sharleen Hamm and Anne Wilson, CSEB Territories Directors.

It's been an active fall in Canada's North, with the discovery of a new species of zooplankton, the official opening of Canada's first permanent road to the Arctic Ocean, a decision from the Supreme Court of Canada on the Peel Watershed, a new premier and cabinet in Nunavut, and annual Geoscience Forums held in both Yellowknife and Whitehorse.

If you haven't had the good fortune of attending the Geoscience Forums, you may be wondering how a geoscience conference is relevant to biologists. As a regular attendee at the Yellowknife Forum and a periodic attendee in Whitehorse, I can advise that these gatherings are an important stopover on the migratory route of any northern biologist; in addition to the great networking opportunities, the Yellowknife Forum in particular, hosted by the Northwest Territories and Nunavut Chamber of Mines, has an entire day of environmental talks, including subjects ranging from paleoecotoxicology, to effects of airborne particulates on caribou, challenges with application of the precautionary principle, regional impact assessment, cumulative impact monitoring, environmental DNA, and many others. The abstract volume is available here: http://www.nwtgeoscience.ca/sites/ntgs/files/resources/v2_abstract_compilation_07nov2017.pdf

Exploration and development activity continue, with a number of major projects proceeding through the environmental assessment and regulatory processes. These processes are run by the co-management boards created under land claims agreements and northern legislation.

Some highlights from across the three territories:

Yukon

- **Supreme Court of Canada** overturns the Yukon Appeals Court ruling regarding the Peel Watershed Land Use Plan. The decision directs the Government of Yukon to resume the planning process based on the 2011 version of the plan. View the Decision here: https://scc-csc.lexum.com/scc-csc/scc-csc/en/item/16890/index.do;
- The Vuntut Gwitch'in First Nation in Old Crow is spearheading a pilot project to conduct the first **human biomonitoring study** in the Yukon. *Read Mary Gamberg's article in this issue of the Bulletin.*

Northwest Territories

- Indigenous and Norther Affairs Canada's (INAC) **Giant Mine Remediation Project** issued the Baker Creek Alignment Report following consultation with community members and stakeholders regarding options for remediation of Baker Creek. The report evaluates options for Baker Creek and will inform the final remediation plan for the creek. For a copy of the final Baker Creek Alignment Report, contact the project team at giantmine@aandc-aadnc.gc.ca;

Grades 1 to 5 students participating in Rivers to Oceans Day in Yellowknife with the Giant Mine Remediation Project team, learning about water education, and getting up close and personal with bugs found in local waters. Photo Credit: INAC

- Also a part of the **Giant Mine Remediation Project**, INAC launched the Health Effects Monitoring Program, a long-term program intended to establish a baseline and to monitor arsenic levels in residents in Yellowknife, Ndilo and Dettah. To participate, contact the program at ykhemp@uottawa.ca;
- The **Inuvik to Tuktoyaktuk Highway** opened in November, permanently connecting the rest of Canada to the Arctic coast by road, and will host ongoing research related to cold climate construction;
- Mackenzie Valley Land and Water Board (MVLWB) is inviting reviewers to submit comments on **Draft Guidelines for Aquatic Effects Monitoring Programs**. To participate: http://lwbors.yk.com/LWB_IMS/ReviewComment.aspx?appid=12346;
- Ongoing environmental assessments (EAs) underway include:
  - **Prairie Creek Mine** (Canadian Zinc Corp.): Hearings were held for the road Environmental Assessment; the Board's decision was released Sept. 12 and next steps are waiting on the INAC Minister's sign-off of the decision. A recent news release targets 2020 for starting production, and notes that the company needs to raise $279 million for construction costs.
  - The **Tlicho All Season Road** is undergoing environmental assessment, with public hearings held Oct. 15-17, 2017. Closing arguments are due shortly, then the Review Board will write its decision report. This infrastructure is a key

factor in the ability of Fortune Minerals to construct and operate the NICO gold project.

- Ongoing activity for various proponents, whether they are moving towards development or have applied for amendments to their water licences, or renewals, or are in the regulatory process with routine requirements for submissions includes:
  - The **Ekati Diamond Mine** has applied for two licence amendments to 1) mine deep deposits in the Misery Pipe and 2) amend potassium effluent discharge criteria. Public hearings will be held in February 2018.
  - **Diavik Diamond Mine Inc**. has submitted their Closure and Reclamation Plan (V. 4.0) and this is out for review. Of interest will be the closure of the in-lake structures, particularly the North Inlet, which has been used for treatment waste disposal.
  - DeBeers Canada's **Gahcho Kue Diamond Mine** started production late in 2016, becoming the third operating diamond mine in the NWT. Various regulatory requirements for management and monitoring plans are under review.
- Full details for current environmental assessments are available on the Boards' web sites at http://www.reviewboard.ca/registry and regulatory files at http://www.mvlwb.ca/Boards/mv/SitePages/registry.aspx.

Nunavut

- INAC Minister accepted the NIRB's recommendation regarding Sabina Gold & Silver Corp.'s **Back River Gold Project**. The NIRB will now compile a project certificate and Sabina can proceed to water licencing with the NWB.
- Public comment period for the Nunavut Impact Review Board's (NIRB) scoping of the **Strategic Environmental Assessment in Baffin Bay and Davis Strait** has just wrapped up. To follow the project visit file # 17SN034 on the NIRB public registry http://www.nirb.ca/application;
- While conducting research for her PhD in Cambridge Bay, University of Manitoba student Auralie Delaforge collected a **new species of zooplankton from the family Monstrilloida**, the first Monstrilloida to be collected from the Arctic Ocean;
- Nunavut Tunngavik Inc. (NTI), along with the three Regional Inuit Authorities (RIAs), is reinvigorating the **Lands Policy Advisory Committee** (LPAC) early in the new year. Connect with the NTI Lands department here: http://ntilands.tunngavik.com/;
- Government of Nunavut welcomes a **new government led by premier Paul Quassa**. Minister of the Environment is Elisapee Sheutiapik.
- Ongoing environmental assessments (EAs) underway include:
  - Agnico Eagle's proposed **Whale Tail project** for its Amaruq satellite resource ore body has gone through public hearings for the Environmental Assessment and Water Licence processes. This development would extend the Meadowbank mine life by several years, with ore trucked to the mill via a 50 km road. A positive EA decision was reached by the Nunavut Impact Review Board (NIRB), with specific terms and conditions as requirements for proceeding. This will need to be signed off by the federal minister before the water licence can be issued.
  - Baffinland's **Mary River project** has submitted a modified Phase 2 EIS submission, which covers development of a rail line and additional marine port for ore transport. This appears to have stalled in the EA process.
- Ongoing activity for various proponents, whether they are moving towards development or have applied for amendments to their water licences, or renewals, or are in the regulatory process with routine requirements for submissions includes the following:
  - Agnico Eagle Mines' **Meliadine Gold project** is under construction, with development on time and under budget. Production is targeted for 2019.
  - Agnico Eagle Mines' **Meadowbank Gold Mine** is in production and has less than two years mine life left (pending approval to extend mining with the Whale Tail deposit).
- Full details for current environmental assessments are available on the Boards' web sites at http://www.nirb.ca/application?strP=r and regulatory files at http://www.nwb-oen.ca/content/public-registry.

Arctic

- INAC is requesting public input into work leading to development of Canada's **Arctic Policy Framework**. To participate, visit this link: http://www.aadnc-aandc.gc.ca/eng/1499951681722/1499951703370;
- The Arctic Council is working with stakeholders to develop good practice recommendations for environmental impact assessment, a project known as **Arctic EIA**. Expected outcomes are development of good practice recommendations and establishment of a network of experts in Arctic EIA and public participation. The project is currently led by Finland, and co-led by Canada and the Kingdom of Denmark. Workshops in Canada are planned for 2018. To follow the project, visit this link: https://www.lyyti.fi/questions/dd9694b857.

Closing:

If you are connected to activities in the Yukon, Northwest Territories, or Nunavut, doing work north of 60° that you would like to highlight in the newsletter, or running some seminars or other training opportunities, please let us know. The CSEB provides a valuable networking and communication forum, and a voice for biologists if there are any issues to be raised. There is also the option of instigating other CSEB activities – both of the fun and/or of the educational variety – with colleagues in the North. Please email your thoughts to Anne Wilson at anne.wilson2@canada.ca or Sharleen Hamm at sharleen@sharleenhamm.com.

Human Health Biomonitoring in Yukon

By Mary Gamberg, Gamberg Consulting, Whitehorse, YK

Porcupine River, Old Crow, Yukon

Wild food is an important part of the diet for many Arctic residents, particularly First Nations and Inuit, who traditionally harvest caribou, moose, fish, waterfowl, small game and many plants. The Northern Contaminants Program is a federal program that provides funding for and guides research on and monitoring of contaminants in Canada's North. As part of this monitoring, large human biomonitoring studies have taken place in Nunavut and Nuvavik and are now being started in the Northwest Territories.

In the Yukon, there has been some research on contaminants in wild foods and long-term monitoring of contaminants in the Porcupine caribou herd. However, although some dietary surveys have been conducted in the distant past, no human biomonitoring studies have been conducted in this territory.

This year, that will change. The Vuntut Gwitchin First Nation in Old Crow is spearheading a pilot project to do just that. Brian Laird from the University of Waterloo who is an expert on contaminants in human health and Mary Gamberg from Whitehorse, Yukon who has been conducting research on contaminants in the Arctic since the early 1990s, have teamed up with the First Nation to conduct the first human biomonitoring study in the Yukon. In October 2017, Laird and Gamberg spent a week in Old Crow working with focus groups to fine-tune dietary and risk perception surveys to best represent the habits and concerns of this isolated community. Early in 2018, the revised surveys will be administered to 127 residents of Old Crow (67% of the adult community) to provide strong baseline information prior to the implementation of the actual biomonitoring.

Brian Laird (right), administering survey to Dana Tizya (left)

Even now, before the surveys have been administered, Vuntut Gwitchin leadership has decided to proceed with plans to conduct the human biomonitoring in 2018/19. As has been done in small communities in NWT, a random sample of individuals from the community will be requested to participate in the study and will be given a choice of how they wish to take part. Options will include giving samples of hair, blood and/or urine for contaminant analysis, along with information about lifestyle that will aid in the interpretation of the results. Participants will be given their individual results and an opportunity to discuss them with researchers and health representatives.

We are excited about doing this work in Old Crow and about working with the Vuntut Gwitchin First Nation. This biomonitoring project will help participants better understand the levels of exposure and risks posed by contaminants in their communities and lay the groundwork for a screening tool to identify those who are most at risk to contaminant exposure. This screening tool, which will be based on those exposure determinants that drive contaminant biomarker results, will enable contaminant risk messaging and follow-up interventions to be tailored to those most likely to exceed health-based guidance values.

How You Can Help the CSEB

- **Contribute to the quarterly newsletter and/or website.** Give us an article on something you are interested in
- **Write a short paragraph about what you have been doing, articles or reports you have written**
- **Provide us with points of views on issues.** Your Executive is always interested in learning what issues concern you
- **Write a book review for the newsletter**
- **Become a Chapter Chair, or offer to join the Board of Directors**
- **Promote CSEB - put up a poster, distribute membership forms** - download from our website
- **Set up a Chapter** - contact any Director for help
- **Organize a CSEB event** - contact any Director for help
- **Attend the annual AGM and maybe present a webinar on your work.**

NOTICE OF CSEB ANNUAL GENERAL MEETING

Mark Your Calendar

Format: Webcast
Date: **February 28, 2018**
Time: 2:00 PM PST; 3:00 PM MST; 5:00 PM EST

Guest Webinar Speaker:
Mr. John Donihee,
Willms & Shier Environmental Lawyers LLP
Topic: **The Precautionary Principle**

John Donihee is one of Canada's foremost experts in environmental, regulatory, administrative and Aboriginal law in Canada's north. John's particular focus is on environmental approvals for resource development, land claims implementation and modern treaties in Northwest Territories and Nunavut. He has extensive experience in and land and water regulation, environmental impact assessment, and wildlife management and land use planning law. John is admitted to the bars of Alberta, Northwest Territories, and Nunavut.

Check the CSEB Website (www.cseb-scbe.org) for more details closer to the AGM.

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LA SOCIETE CANADIENNE DES BIOLOGISTES DE L'ENVIRONNEMENT

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The Canadian Society of Environmental Biologists

Membres Réguliers: les personnes ayant un degré ou diplôme d'un collège ou une université dans une discipline des sciences biologiques et qui sont ou qui ont déjà éte engagé professionnellement en aménagement, enseignement ou recherche tenant a l'environnement ainsi que ressources naturelles.

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