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THE CANADIAN SOCIETY OF ENVIRONMENTAL BIOLOGISTS Newsletter / Bulletin

In this Issue:

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- **Regional News**
- **In Memoriam - Loss of three CSEB Members**



CSEB Newsletter Bulletin SCBE

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Front Cover: RC BioSolutions conducting baseline sampling in the Kitikmeot region of Nunavut. Photo Credit: Richard Carson, RC BioSolutions.

Back Cover: Top: Field meeting of the Garry Oak Ecosystem Recovery Team meeting at Mt. Tzouhalem, Vancouver Island, early May, 2017

Lower Left: *Viola praemorsa*, a Red-listed rare yellow montane violet

Lower Right: Mt. Tzouhalem restored Garry oak ecosystem. Photo Credits: Loys Maingon, BC CSEB Director

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CSEB NEWSLETTER 2017

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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 2 Été 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 activités 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 diversifié d'environnementalistes Canadien. Les membres sont invités à contribuer des articles, photos (noir et blanc) ou des messages qui sont d'intérêt nationale en sciences biologiques et environnementales. Les lettres à l'éditeur sont bienvenues.

Tout la correspondance 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'éditeur:** 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.

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NATIONAL News

PRESIDENT'S Report

By Anne Wilson, CSEB President

Although I have been somewhat buried by work and the tax season, one of the things on my mind these days is the protection of the marine environment (or lack thereof). Currently, marine pollution issues are receiving a lot of attention in the press, and in the scientific literature as well. Problems are evident on a global scale. As a frequent traveller, I often get the perspective from 10,000 m altitude of the vastness of the ocean, and can be misled into thinking it has an infinite capacity to assimilate all the perturbations and contaminants that are being directed into it. These include changes associated with natural forces driven by climate change, and inputs of chemical and physical contaminants from land-based sources. Nutrients, thermal changes, acidification, and chemical inputs are causing impacts to marine waters. For example, even the deep ocean trenches have been shown to have levels of persistent organic pollutants that are similar to or higher than coastal waters. Most people are aware of the debris issues, such as the Great Pacific Garbage Patch.

Many of the sources of pollutants are from countries with poor environmental regimes and track records, and beyond awareness and making personal choices that support good practices, there doesn't seem to be a lot individuals can do. We can ask our politicians to act in the bigger picture though. Events such as spills tend to grab the attention of the public (e.g., Deepwater Horizon), and can give rise to the political will that can lead to changes. I have been following the ban on drilling in Arctic waters, first announced in mid-2016 by Trudeau and Obama, and most recently, revisited by Trump with an executive order to review restrictive drilling policies. At this time, there is very little interest in offshore drilling in Canada. In the previously-active Beaufort Sea, this activity is now regulated by the Government of the NWT, which wants the ban to be ended after five years. In Nunavut, offshore drilling of reserves in the high Arctic is a contentious issue, still regulated federally. This might be an issue the CSEB should lend our voice to, and there are many others.

Closer to home, I am concerned that UNESCO has threatened to add Wood Buffalo National Park to the list of World Heritage Sites in Danger, unless things improve. The park is threatened by energy development, hydro dams, and poor management. Cumulative effects are a real concern, and better studies and monitoring are recommended. A strategic environmental assessment led by Parks Canada is also underway, and it will be interesting to see how this unfolds.

Do you have anything keeping you awake at night? Let me know if there are issues on your mind that the CSEB can provide a voice to take forward. And in the meantime, I wish all of you a safe and enjoyable summer!

In Danger: UNESCO Issues Warning About Wood Buffalo National Park

The park will be added to the list of World Heritage Sites in Danger

The Canadian Press Posted: Mar 10, 2017 10:37 AM MT Last Updated: Mar 10, 2017 10:37 AM MT



The world's largest beaver dam in Wood Buffalo National Park, a UNESCO World Heritage Site. (Parks Canada)_

A United Nations agency has issued a warning about the environmental health of Canada's largest national park.

In a report released Friday, UNESCO says northern Alberta's Wood Buffalo National Park is threatened by energy development, hydro dams and poor management. It warns that unless management of the area improves, the park will be added to the list of World Heritage Sites in Danger.

The report acknowledges that the overall condition of the vast park — bigger than the Netherlands — remains good. But it concludes there's no guarantee of that continuing.

"There is long-standing, conceivable and consistent evidence of severe environmental and human health concerns based on both western science and local and indigenous knowledge," the report says.

"The concerns coincide with the absence of effective and independent mechanisms to analyze and address these concerns at an adequate scale."

Check out the CSEB Video at
<http://youtu.be/J7cOuDbBf9c> or
<https://www.youtube.com/watch?v=J7cOuDbBf9c>

UNESCO Begins Monitoring Mission of Wood Buffalo National Park

UNESCO inspectors visited the park in September and October. They came at the urging of First Nations, who have long expressed concern about the cumulative impacts on the Peace-Athabasca Delta of hydro projects in British Columbia, oilsands development in Alberta and climate change, which is already changing the landscape.



A map of B.C. Hydro's proposed Site C dam project (B.C. Hydro)

Members of the Mikisew Cree First Nation say they can no longer get to large parts of their traditional territory because water levels have been declining for more than a generation, starting with construction of the Bennett Dam in the 1960s.

The park is being affected by upstream energy development, the report says.

UNESCO says evidence suggests the oilsands are depositing contaminants in the air, water and land. It says toxins such as mercury are showing up in the food web via bird eggs and fish.

“Governments and industry seem to be unwilling to adequately monitor or accept these claims.”

UNESCO's report includes 17 recommendations. They include suggestions to work more closely with First Nations, conduct studies on water flow and to improve monitoring.

“The mission fully agrees with most observers that continuation of the development approach of the last decades renders the future of (the park) uncertain at the very best.”

Wood Buffalo National Park comprises 45,000 square kilometres that straddle the boundary between Alberta and the Northwest Territories. The park covers grasslands, wetlands and boreal forests laced with numerous rivers, creeks, lakes and ponds.

It is home to the world's only breeding ground for endangered whooping cranes as well as to the largest herd of free-ranging wood buffalo left anywhere. It is also the summer habitat and breeding ground for billions of boreal songbirds whose migration routes spread throughout the continent.

It became a World Heritage Site in 1983. Shifting it to the endangered site list would make it one of only two such sites in North America and put it in company with others threatened by civil war and social breakdown.

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Upcoming CSEB Research Webinar

North American Green Sturgeon: Status and Recovery Efforts

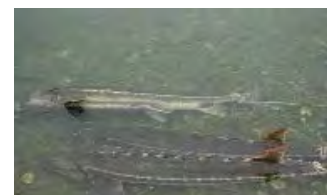
Join us for a webinar on Jun 13, 2017 at 10:00 AM PDT.

Register now!

<https://attendee.gotowebinar.com/register/6054885571591830786>

First of two webinars on Green Sturgeon Recovery. Conservation of the anadromous North American green sturgeon (*Acipenser medirostris*) is an endangered species in the U.S. and Canada. The green sturgeon ranges from Mexico to at least Alaska in marine waters, and forages in estuaries and bays ranging from San Francisco Bay to British Columbia. Covering status and recovery efforts, this two-part webinar will focus on biology, ecology, conservation efforts, and research needs (Part I) and an overview of the U.S. recovery plan, which will be presented once plans are finalized. (Part II).

After registering, you will receive a confirmation email containing information about joining the webinar.



REGIONAL News

BRITISH COLUMBIA News

By Loys Maignon, CSEB BC Director

Shifting Times in BC

As I write, BC is in the final stage of an election which, if pollsters are more right than usual, is likely to result in the end of 16 years of the BC Liberal government. The end of a business-friendly, pro-development government that started out in 2001 with some of what was, at the time, some of North America's most progressive environmental legislation, including a carbon tax that accompanied a well-developed climate plan. After Gordon Campbell's resignation in 2011, the government froze its environmental and climate change programmes and has since prioritized business and development interests.

The most interesting environmental news in BC this spring reflects this shift in focus, from a balanced pro-business but environmentally committed approach, to a government practice that increasingly favours resource development at the expense of the environment. Nothing really brings this out as much as the government position since the Mount Polley disaster back in August 2014. Quietly, this recent disaster has been withdrawn from the public eye and concern. It remains, however, a major irritant for BC's relations with Alaska, as the drainage contaminates salmon habitat and significant fisheries downstream. The collapse of the Mount Polley retainer dam was to a considerable extent brought about by the government of BC's cutback in the technical expertise required to guarantee the level of oversight needed to maintain adequate levels of public environmental safety. This constant concern was articulated by professionals just months before the event:

*"The Professional Employees Association, in a report last March, noted that the province has reduced its complement of scientific and technical experts – engineers, agrologists, foresters and geoscientists – by 15 per cent since 2009. Five months before the Mount Polley breach, the association warned those reductions could threaten both public safety and the environment because of inadequate monitoring and inspections."*¹

Indeed, since at least 2006, there has been a growing concern with the structural integrity of the many earth dams distributed in rural areas around the province, particularly so in the wake of shifting climatic conditions, which are increasing snow melt and flooding. These failures are known to be common. The failure of one such forestry dam at Chute Lake in the Okanagan in 2012², prompted a detailed scientific review of major occurrences since 1907.³

Nearly three years after the Mount Polley disaster, criminal charges have yet to be laid against the mine owners. The mining license for Imperial Metals to operate was renewed by the province within a year of the accident. Last month a permit

was quietly issued to allow Imperial Metals to discharge directly into Quesnel Lake – a matter that has been publicly opposed ever since the accident⁴, and the federal government has intervened to quash lawsuits against the mine owners.⁵ Public concern that the statute of limitations to lay charges will expire in the coming months has moved members of the public to press charges against Imperial Metals.⁶

While BC has gained international notoriety as "The Wild West of Political Cash,"⁷ its less well-publicized mining track record could earn it an international reputation for unregulated dam-building. In spite of the growing realization of the impacts of projected increases in large precipitation events and the ever-present reality of being in an earthquake zone, BC does not appear to have been sufficiently chastised with the experiences of the Testalinden dam collapse in 2010, and the 2014 Mount Polley Mine disaster, and the growing concern of the stability of dams controlling the watershed surround Campbell River.⁸ Between 2012 and 2014, "Progress Energy," a subsidiary of the BC government's central partner in the development of LNG, "Petronas" has constructed "16 unauthorized dams" in the Montney Basin, to sustain fracking, which has itself been associated with magnitude 4.2 seismic activity in the region. Although each of these earthen dams is large enough to have required a full environmental assessment review by the province's Environmental Assessment Office, no review was carried out or permit obtained. When Ben Parfitt of the Centre for Policy Initiatives, who first reported this egregious violation of environmental laws, states that "*Either the regulator knew these dams were being built and didn't do anything or they didn't know and didn't do anything. In either case, we are experiencing a meltdown in regulatory oversight,*"⁹ that is an understatement of the state of the government's environmental stewardship obligations!

Beyond the books, in practical terms, there are really very few enforced penalties in BC for violations of environmental laws or processes. It seems that it has become increasingly common for proponents to carry out projects without proper public consultation, assessments, or permits. Not only do permits appear to be obtained without appearing to follow a rigorous process, increasingly, when parties are "caught" proceeding without an environmental permit, a "retroactive permit" is issued to the violator without any penalty, as happened when the Town of Comox was found to have proceeded with the construction of a seawall in a rare, sensitive sand dune ecosystem, without the requisite permits or public consultation.

BC has returned to the wild west of the post-war industrial boom, in constant search of an economic bonanza, or at least, the illusion thereof. The priority of the current government, contrary to messaging of "sustainability" and "green initiatives," is not the environment. It would be easy to suggest that the messaging is simply hypocrisy. In fact, it is not. A recent article, "*Ecosystem management as a wicked problem*" (Science, April 21, 2017) by DeFries and Nagendra, sheds some light on this.¹⁰ BC's economy has always been, and no matter what the starry-eyed

economists wish to have us believe, continues to be dominated by resource extraction – and the logic that comes with it. That mining and energy remain the drivers of current environmental conflicts confirms that. The authors of this article suggest that it is impossible “to foresee all the consequences of interventions across different spatial, temporal, and administrative scales.” Notwithstanding that some of these interventions might be mitigated by following environmental regulations, oversight, and permitting, the authors note that our management of the environment remains constrained by the logic of “sustainable maximum yield” of single species, or target resources, largely as though they existed independently of their ecosystemic context.

Notwithstanding the ground-breaking work of the 1972 *Limits to Growth*, it is remarkable to consider, as the authors of this paper do, that “ecosystem management” was invented or coined by USDA Forestry Chief F. Dale Robertson, only in 1992. That is 10 years before the current BC government was first elected, and appointed the officials who currently oversee environmental portfolios. In other words, the prevailing logic within this government is “pre-1992.” It appears to be the logic of extracting a “maximum sustainable yield” of resources within a balanced environment at equilibrium, without a clear sense of ecosystem interdependency within a dynamically shifting environment. Once again, the government is not changing with the ongoing shift in our understanding of environmental management. As De Fries and Nagendra note, the sense of interdependency and the human impact or footprint on the environment really emerged in official circles only in 2005 with the United Nations Millennium Ecosystem Assessment.

The environmental practices of this government, as illustrated by the mining practices and dam failures witnessed over the past seven years, and its often contradictory environmental policies, reflect a government out of touch with the developing science of environmental management over the past 25 years. As the authors note, “*Another fundamental shift from the maximum yield paradigm came from the realization that human societies depend on ecosystems for well-being and services other than commodities. In 2005, the Millennium Assessment called attention to the multiple services provided by ecosystems.*” In BC, thanks to the work of the David Suzuki Foundation, municipalities are really just beginning to talk and consider “Eco-asset Strategies,” which means considering the value of natural capital through environmental planning, such as has been implemented by the Town of Gibsons, which is being considered by some municipal governments as a model for implementation.¹¹ It may be cautionary to note and keep in mind that as our understanding of the complexities of environmental management increase, the “eco-asset strategy” may already be out of step with what is required in an age of climate change.

In this respect, it is interesting to note that while the provincial government appears to be increasingly an environmental laggard, municipalities are taking the initiative to catch up with our shifting understanding of environmental management. What is interesting is how far out of step the provincial government seems to be at this point.

One of the most interesting developments in BC this spring has been the release of the last of a five-part report prepared by the

UBC “Programme on Water Governance” on the economics of Site C. As with the lack of oversight and public consultation with regards to other resource extraction, Site C was expedited with the granting of an extraordinary number of exemptions, and proceeded against the objections of several expert opinions who expressed serious economic concerns.¹² The UBC report notes that, as was expected, demand for hydro-electric power has now dropped considerably, and that the current project will not be economically viable for at least the next decade.¹³ It goes on to point out that if demand does not keep up with BC Hydro projections, which is quite likely, given the rise in cheaper alternatives and the impact of conservation measures, electricity generated from Site C “will remain in surplus indefinitely, resulting in a multi-billion loss.”

While the report focuses largely on costs to the BC ratepayer, it is the environmental short-term and long-term costs that should concern all Canadians. The exemptions given by the provincial government, and subsequently upheld by the federal government, dismissed the rights of Treaty 8 First Nations:

“Although these communities’ rights are constitutionally protected, we believe they have been systematically downplayed – even ignored – by governments,” said Gordon Christie, professor in the Peter A. Allard School of Law at UBC. “This demonstrates a profound lack of honourable activity by the Crown, where the legal tests in this country now rest on the notion of the ‘honour of the Crown.’”

The project, which will not be complete until 2024, has been fast tracked to make its future irreversible. It can, therefore, at best be stopped and mothballed. The extent of the environmental impact, before the election, was intended to be irreversible and is currently quite extensive. Outside of its debatable “economic importance,” the Site C project is set to extend along 100 km and flood about 85 square km of the Peace River from Hudson’s Hope to Fort St. John.

This valley bottom is culturally, archaeologically, and ecologically important; the loss of these values deserves special consideration. While the case for the biodiversity values not reported in the Joint panel Review Report¹⁴ that are to be lost with the construction of the dam has been reported by David Langor of the Biological Survey of Canada,¹⁵ archaeological considerations may also need closer scrutiny. One of the most remarkable finds in BC this spring has been the discovery of a 14,000 year-old Heiltsuk village on the BC coast.¹⁶ This startling revelation has profound archaeological and biogeographical implications, that once again go back to our shifting understanding of interdependence in ecosystem management. This find not only changes our understanding of human history and cultural continuity in North America, it also confirms the existence of refugia that we could only speculate about until recently. Given that Site C is a rich and poorly known depository of archeological and biological values, the precipitated nature of this project seems as ill-conceived as management by maximum sustainable yield.

Fortunately, BC may be set for change in the forthcoming election. One remarkable aspect of this election is that, in keeping with the growing call for scientists to step forward and increase their voice and engagement, this election is seeing an unprecedented number of BC environmental scientists seek office, notably

Andrew Weaver and Andy McKinnon, both of whom are well-known to British Columbians for their environmental advocacy. Given where the past 20 years have taken BC's state of the environment, expert scientific guidance in government is more desirable than ever.

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Salmon River Fly-fishing - A Day in a Retired Biologist's Life

Submitted by Bruce Murray [drbm@shaw.ca], Director, Island Waters Fly Fishing Club, and Fish Habitat Restoration Biologist, retired

During the week leading up to Friday April 7th, I was planning on attending Normie's last fly tie for the season in Royston when I got a call from Dan the Man from Lotus Land saying we should steelhead the Nanaimo River, as this was their run time when he was in school; then Basher emailed to say checking his journal that, yes, this was (historically) steelie time in the Nanaimo. Sooo sorry Normie, we decided to go steelie hunting on Friday April 7th. However, on the morning of....the Nanaimo blew out as all local streams, so checking the hydrographsah the Eve and the Salmon appeared to have been missed by this front, so off Dan and I went pursuing the wily steelie, waving of course to the crew of tiers as we passed Royston Hall.

First stop was the Salmon, just got set up on the first run, when behind us appeared the "previously reported extinct species" ... two CO's.....awesome they live and they are working, walking the streams. I was so shocked and happy I asked if I could take their photo as proof that a few survived Kristi's budget knife and are thriving. I must thank Normie and all the others that pointed out that it was April and new licences needed to be purchased. And a special thanks to Jason who printed four copies and insisted I put one in my waders, one in my wallet, one in my jacket, and one in the SUV.

Next surprise was on my first cast through the third run a gorgeous 20 inch rainbow doe slammed me and tap danced her way to the bottom of the run, posed briefly for a picture then headed back to the wild. I was ready to move on downstream when Dan reminded me to fish "my spot" again as these fish are holding in groups, so I returned upstream and cast to the same glory hole when I was hit by a thunder bolt. He made four monster runs over 10 + minutes as I fought him downstream through the run and into the next before it became a stalemate...a little to him and a little to me and more to him....and it gave Dan time to race downstream to position himself with the net when my line broke at a knot junction to the backing... Next thing I know Dan is heading out into the river, grabs my broken line and wraps it around the net handle preparing to bulldog this monster buck steelhead. That gives me time to catch up and wrap the broken line around my arm while Dan frees the net and nets the trophy. What a sight! After a photo for the grand kids, "my" trophy rips my hand off and charges back upstream to his buddies and girlfriends while I, completely exhausted, and happily experiencing either a heart attack or a hernia...or both... until the muscle spasms in my arms, shoulders and groin subside. Wow, the thrill of experiencing the power of a winter steelhead....exhilarating and infectious! "I am haunted by monster winter steelhead". I wish everyone could experience the excitement and appreciation for wild (big gorgeous, powerful) fish.

A very, very special thanks to my good buddy Daniel Krenz <https://www.instagram.com/outdooraddictionsbc/> for making my day and taking this photo.



Big Steelie Buck....34 inches of unbelievable power

ALBERTA News

By Brian Free, CSEB Member

I had reported in a previous newsletter report that whirling disease, a disease affecting Alberta's mountain whitefish and trout species (rainbow, westslope cutthroat and brook trout), had been found in Banff National Park in the upper reaches of the Bow River. Now it has recently been confirmed for the Oldman River, another mountain-fed watershed in southern Alberta.

On Earth Day - April 22, 2017 - an international movement organized citizen marches in support of science in about 600 cities around the world. In Canada, there were marches in 18 cities across Canada and, in Alberta, marches were held in Calgary, Lethbridge and Edmonton.



I joined the march at the Alberta Legislature in Edmonton. There were over 300 enthusiastic supporters, despite the cold weather. Some were dressed in lab coats, some carried home-made posters and there was one T Rex.... Really!

There were four speakers who offered their perspectives about the important role of science in our society. Support was also expressed for our American scientific colleagues, now under that new President. There was lots of cheering during the speeches and I found it comforting that there appears to be broad societal support for science, which aligns well with the objectives of the CSEB.



SASKATCHEWAN News

By Gary Ash, CSEB Newsletter Editor

May 7 to 13 Was Aquatic Invasive Species Awareness Week in Saskatchewan

The Government of Saskatchewan proclaimed May 7 to 13 as **Aquatic Invasive Species Awareness Week** to highlight prevention and make people aware of the risk to the province.

Aquatic invasive species (AIS) such as zebra and quagga mussels are a significant threat to Saskatchewan's lakes and waterways. These small but destructive species have already been discovered in Ontario, Manitoba, and 34 states, including Montana and North Dakota.



"Invasive mussels and other species can be extremely difficult to manage if they become established in a waterbody," Environment Minister Scott Moe said. "Prevention is the most effective solution to aquatic invasive species. The province will continue to educate boaters and other recreational water users to CLEAN, DRAIN, DRY boats, watercraft and equipment. This includes boaters visiting Saskatchewan, moving between water bodies, and returning home from out-of-province."

In 2016, the ministry invested more than \$450,000 to prevent aquatic invasive species, including resources to inspect 776 watercraft and decontaminate 25 watercraft. Two of the decontaminated boats had visible mussels attached.

Seventy waterbodies across the province were also sampled through two monitoring programs. The 2017-18 budget includes up to \$500,000 for AIS initiatives. This includes funding for education and awareness, inspections, and decontaminations.

The government is also increasing its focus on high-risk watercraft entering the province in 2017. The province will conduct roadside watercraft inspections this year, with a focus on Manitoba and U.S. borders, and high-risk waterbodies and events, such as fishing and boating events and wakeboard competitions, which see an increased number of boats entering the province from other jurisdictions.

The ministry has intercepted boats in Saskatchewan and in neighbouring jurisdictions over the past several years. There has

been no record yet of zebra or quagga mussels in Saskatchewan waterways.

Saskatchewan also collaborates with federal, provincial, and territorial partners, including Manitoba, Alberta, British Columbia and Yukon. This includes co-ordinated inspections and a federal task force established by conservation ministers. This type of collaboration and co-operation is vital to increasing the effectiveness of collective efforts in providing awareness about aquatic invasive species, while preventing their spread.

To report suspected invasive species, please contact the nearest Ministry of Environment office or call the Turn In Poachers (TIP) line at 1-800-667-7561.

More information about fishing and aquatic invasive species can be found in the Saskatchewan Anglers' Guide, and online at www.saskatchewan.ca/fishing.

For more information, contact:

Michele McEachern

Environment

Regina

Phone: 306-787-0412

Email: michele.mceachern@gov.sk.ca

MANITOBA News

Submitted by Robert Stedwill, CSEB Past President.

A 2017 Update on The Status of Zebra Mussels in Manitoba

Further to my report on zebra mussels (*Dreissena polymorpha*) in the last issue of the newsletter, I have searched Manitoba websites to determine the current situation in the province. The future does not look bright.

The mussels have now spread further in the Red River and Cedar Lake, in addition to Lake Winnipeg where the mussels were first identified in 2013. Manitoba Hydro has been monitoring for zebra mussel veligers for the past 25 years, knowing that the potential impact on hydro operations could be significant, based on operational experience in the United States and Ontario.

In 2014, a sample of Red River water as it empties into Lake Winnipeg was taken, and 25 veligers were identified. A similar sample was again taken in 2015, and the number was 2670. Last year's (2016) sample identified 87 000 veligers, which is not surprising, considering that female mussels release in excess of one million eggs a year, with males releasing something in the order of 200 million sperm into the water where fertilization takes place.

In 2016, it was realized that the province had a significant problem on its hands, especially when boaters and cottagers were encountering dead and dying mussels clinging to their boats and docks, and washing up in the millions on Lake Winnipeg beaches.



Candace Parks of the Manitoba Government at Beaconia Beach in the south basin of Lake Winnipeg – September 2016

The province spent \$700 000 on education, alerting boaters that inspections were required. Five inspection sites around the province were set up at strategic points, with 3800 inspections undertaken, and \$25 000 utilized to decontaminate boats. Of greater concern were the 215 boaters who failed to stop to have their boats checked as they moved from lake to lake. To be effective, fines needed to be levied; not only for putting a water craft in the water without having been inspected, but also for failing to stop. The cost to a provincial economy is too great to do anything less. Presumably, Manitoba will be stepping up its efforts this boating season.

Although Manitoba Hydro has not yet encountered any issues to date that I am aware of, plans are underway to develop a chlorination system, which will hopefully, effectively kill off active veligers. The clogging of water systems within Manitoba Hydro' operations of up to 40%, could effectively shut down electrical generation at affected generating stations.

From my own experience at SaskPower, diligent monitoring has kept its operations going mussel free for the past 20 years, but it is good to see that the provincial and territorial governments west of Manitoba are taking the issue seriously, and are coordinating their efforts to keep the mussel from spreading. Presently, there are in excess of 750 lakes and river systems affected in North America, most of which have become home to zebra mussels due to contaminated water craft moving from one body of water to another.

Currently, no government west of Manitoba, to the best of my knowledge, has indicated a zebra mussel problem. However, it will only take one of the irresponsible boaters who bypassed the Manitoba boat inspection sites in 2016 to change that picture.

Photo credit: Gross, sharp, environmentally invasive: Zebra mussels blanket Beaconia Beach: 'Massive piles' wash up on shore of beach in south basin of Lake Winnipeg. CBC News Posted: Sep 30, 2016 2:35 PM CT

ATLANTIC News

Submitted by Patrick Stewart, CSEB Atlantic Director

The Atlantic Region continues to be active and both a director and National Secretary-Treasurer of CSEB are located here. Karen March and I have been supporting CSEB National initiatives. In particular, the webinar series launched by the National Office last Fall has offered promise to attract new members to CSEB. Webinars are a great opportunity to receive and share information at the leading edge of important environmental topics. They are also a chance to share what you know with others in Canada and even around the world, cheaply and with only a small time commitment. So if you're an expert in your field and have a PowerPoint or other presentation prepared, consider offering for a webinar presentation.

Another of our objectives in the Atlantic Region is to encourage the discussion and responses to environmental issues, which members and even non-members in the area—which includes New Brunswick, PEI, Nova Scotia, and Newfoundland and Labrador—can identify and approach us with, for national consideration. We can help to marshal support for your topic and use our resources, such as the website, to solicit support and discussion.

New members in the Atlantic Provinces are always welcome to come up with ideas for, and get involved in, setting up meetings and speakers. We'd like to reinvigorate local chapters in major cities and university campuses, and help of all kinds is welcome.

Management of Nova Scotia's forests is always in the news here as standard forestry practices are increasingly examined under the microscope of new knowledge and understanding of forest processes. Industry reluctantly inches forward (some feel they're not moving at all), but many feel the continuing use of standard forest practices like clear-cutting and biomass harvesting, and continuing slow adoption of new, less destructive practices, potentially will cause irreparable damage to our forests.

A group of biologists, many of whom work for Nova Scotia's Department of Natural Resources, have infused the current discussion with a dose of useful information by translating their knowledge into A Field Guide to Forest Biodiversity Stewardship, a new guide to stewardship of forests, which will help to raise the bar. Information presented in the guide will be useful to foresters and biologists alike who are involved in managing and using Nova Scotia forests. The authors are all experts on biodiversity and conservation; and the work is authoritative and likely to be useful to biologists across Canada. Download it from novascotia.ca/natr/library/publications/forestry.asp.

Summer is the 'prime season' for field and environmental biologists, a chance to get out in the wild to places we all enjoy in weather conditions that are tolerable, if not enjoyable. I hope all those reading this have a chance to get out 'in the wild' and thrill at the experience, either at work or at play.

Mt. Robson – View from the Porch

A poem by Peter Wells, CSEB Atlantic Member

On an enchanted summer morning,
Viewed from the porch of Hargraves Shelter,
Robson's majestic summit shines brightly,
The mountain, hugging the shores of Berg Lake,
But so lightly.

The peak sparkles, fresh and cold,
In the rays of the rising sun,
Lighting up the mountains' vast glaciers,
The scene,
A truly glorious one.

But suddenly, dark clouds appear,
Drifting in from the west,
Gathering around the summits' crest,
A mist moves down its icy cliffs,
Like a soft blanket,
Smothering every rift.

At the shelter, a rain shower starts,
Slowly, so slowly,
Rain drops patter on the roof,
Bringing freshness to the rocky landscape,
And at the lake below,
It's a scene aloof.

Serenity descends upon the alpine wilderness,
Immersing the silent watcher,
Framing the view of Robson,
With memories, from the porch,
Forever.

1. Mt. Robson is located in Mt. Robson Provincial Park, BC, a one hour drive west of Jasper, Alberta. It is the highest mountain in the Canadian Rockies. It offers unparalleled hiking and camping experiences, and breathtaking scenery. Nine of us, my western relatives and I, backpacked to Berg Lake in August 2013 and camped there. For me, it was a poignant moment in time as I was following the footsteps of July 1970, when I hiked straight through with friends, Kevin O'Connell and Kathy. My good friend Kevin, a medical student at McGill, died climbing in the Andes in Peru a few years afterwards. This poem is dedicated to him.

Highlights of the AAAS 2017 Annual Meeting, Feb. 16-20th, 2017, Boston, MA

Submitted by Peter Wells, CSEB Atlantic Member

This year's annual meeting of the American Association for the Advancement of Science (AAAS) took place in Boston, MA. I was able to attend it. The theme was "Serving Society through Science Policy". The full program is available at www.aaas.org/meetings. It was a huge conference, as AAAS has over 100,000 members. Many subjects on current research across the full spectrum of science were discussed in various concurrent sessions. One had to be selective about which to attend.

One of our collaborative research projects at Dalhousie University is investigating the use and influence of marine environmental information (science), especially in state of environment reports produced by governments and other sectors (see www.eiui.ca). Our research team is examining the processes of information flow at the science-policy interface and the formation of evidence-based or evidence-informed decision making (also see MacDonald et al. 2016; Wells 2003). Hence, interest in this conference was huge. I attended sessions such as "How to connect science with policy across the globe: landscape analysis", "engaging scientists and engineers in policy discussion", and "science for the land-sea interface: informing coastal and near-shore marine policy". Take home messages included the importance of personal relationships and effective communication in the science-policy process, the crucial role of citizen science in policy formation, the continued need for NGOs to be involved in government workshops that discuss policies, the use of social media in the engagement process, and the principle that evidence informs policy, it does not make policy.

These points are worth reflecting on, as environmental biologists produce much of the information, i.e., the evidence that is underlying much of the environmental policy formation of the day. Think oil sands and the important role of environmental monitoring! Think national parks and the need to rebuild the science capacity in order to protect habitats and wildlife, and to have effective long-term policies for forest fire mitigation and adaptation. Think whether or not dispersants (chemical dispersing agents) should be used at oil spills. We are all involved to some degree in producing science for policy; understanding the processes surely augments the overall goals of environmental biology.

The highlights of two other sessions may be of particular interest to CSEB members: "The legacy of Deepwater Horizon: New science affecting marine oil development policy", and "Global environmental assessments and the bridge to environmental policy".

Three talks discussed the legacy of the Deepwater Horizon blowout in the Gulf of Mexico. The follow-up research effort is enormous — \$500 M over 10 years. So far over 800 publications have been produced, along with thousands of presentations. Current oceanographic research is especially focused on the role of riverine transport of hydrocarbons, given the spill's proximity to the coast; the presence and influence of "marine snow", very small oil-particle aggregations in the water column; the processes

of oil droplet formation in the deep sea; fine scale oil behaviour; and the effects of oil dispersants on oil biodegradation. Biological research includes projects on in-situ effects and monitoring, laboratory ecotoxicology, spatial analysis of the spill to establish exposure regimes, many field experiments and measurements, and comparison with the 1979 Ixtoc platform blowout in the Gulf of Mexico, which is still having ecological impacts in coastal waters. A considerable education and outreach program is linked to the research on the Deep Water Horizon. Recent research syntheses can be found in Bioscience (2014); the Oceanography Journal (2016); and Currents (2017).

The session on "Global environmental assessments and the bridge to environmental policy" was especially interesting, with three very insightful and information-packed talks. Jack Kaye of NASA introduced the session by stating that "environmental assessments have a major role when scientific communities come together" around a particular topic. Consider the recent reports — the World Ocean Assessment, the biodiversity report, and the USA national climate assessment. The US government enables these scientific reports as part of the underpinning of policy to address pressing issues.

Paul Newman of NASA told the ozone story that started in the 1970s when CFCs were found to be affecting the ozone layer. This led to many meetings and assessment reports, the immediate establishment of the Montreal Protocol and CFC regulations, and later amendments to the Protocol. This activity took place over a 30 year period, a process still continuing supported by regular assessment reports. CFC production and emissions are not completely controlled globally but sufficient progress has been made to predict that the Antarctic ozone hole will recover by 2070. Katherine Mach of the Carnegie Institution for Science in California told the IPCC Climate Assessment story, pointing out that the technical assessments must be comprehensive, well-reviewed, have had consensus approval from governments, and by policy relevant, not policy prescriptive. The whole process has many lessons for understanding, managing and reducing the risks of a major environmental perturbation.

Finally in this session, Robert Corell of the Global Environment and Technology Foundation of Florida talked about "the Arctic Climate Impact Assessment (ACIA) and its Implications for Environmental Policy". This report was requested by policy makers in the Arctic nations, the Arctic Council. Its key findings "were negotiated", involving hundreds of scientists and much discussion and compromise. It was stressed that the assessment itself is not an event, as producing each one is a continuing process and "comes out when it is ready"! It is a deliberation with analysis, and clearly an iterative process. Important conclusions are that more assessments are needed at the regional level; long term monitoring and process studies with modelling of the environment are a key need; the Arctic is a global ecosystem with non-linear processes occurring that control change, and producing surprises; boundary organizations are important in the assessment process; and the assessment produces many emerging ideas for research. The ACIA process will continue, with emphasis on research on the permafrost, the resilience of various ecosystems, and identifying adaptation actions for a changing Arctic.

CSEB members are encouraged to look up the AAAS program and follow the discussions on the science policy interface that will undoubtedly continue unabated in the new political climate. In particular, see the recent issue of *Science*, Vol. 355(6325), Feb. 10th – Path of Evidence – Why turning data into policy is harder than it sounds.

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TERRITORIES News

Submitted by Anne Wilson, CSEB President and Territories Director

NWT and NU Regional Update:

In the North, this is the time when students come home, or move north to work, and many researchers do their field programs – and the tundra comes to life! Anyone doing scientific work has to have a scientific permit, issued by either the Nunavut Research Institute or the Aurora Research Institute in the NWT. I was browsing the NRI and ARI web sites, and the compendium of projects is wide-ranging: everything from marine mammals, to baseline programs for developments, to permafrost, air, biodiversity, climate change, archaeological studies, socioeconomics, geophysical, ice science, hydrology... and much more. Much work is done by industry, and by academia. There are studies underway to look at the effects of climate change on the some little-studied Arctic marine areas, which will be a moving target. Knowing the challenges of costs and logistics in the far north, I am impressed by the amount of research that is underway. There seems to be more of a push to bring communities in to participate in the monitoring, and that will strengthen the datasets with more continuous data, as well as raise awareness on local levels.

Exploration and development activity seems to be picking up slightly in the NWT and NU, with number of major projects proceeding through the environmental assessment and regulatory processes.

Mining and other development news

The first major process for any development is the environmental assessment process, run by the co-management boards created under land claims agreements and northern legislation.

Ongoing environmental assessments (EAs) underway in the NWT and Nunavut include:

- Agnico Eagle's proposed "Whale Tail" project for its Amaruq satellite resource ore body is under review. This development would extend the mine life by several years, with ore trucked

to the Meadowbank mill via a 50 km road. Technical meetings have been held, and public hearings are expected this fall.

- Sabina's Back River gold project (NU) is undergoing further review, with specific issues being considered (caribou, marine, freshwater). Hearings are scheduled for May 31 – June 3rd in Cambridge Bay.
- The Hope Bay Phase 2 Draft Environmental Impact Statement is in hand, for the development of satellite ore bodies in two areas south of the existing Doris North mine. Technical meetings are scheduled for June 12 – 14th, and hearings are expected to be in late 2017.
- Prairie Creek Mine (Canadian Zinc Corp.): Hearings were held recently for the road Environmental Assessment, and the next step will be the Board's decision. The company is also working to assemble financing needed to take the mining project into production.
- 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. A major modification is the use of only open-water shipping, in response to concerns from Inuit living in the area.
- Revised terms of reference were issued last February for the impact assessment of the Mackenzie Valley Highway project, now reduced to 333 km of all-season gravel road connecting Wrigley and Norman Wells. This EA is still waiting on the submission of the Developer's Assessment Report.

In the regulatory forum, there is ongoing activity for various proponents, whether they are moving towards development or have applied for amendments to their water licences, or renewals. March 31st is submission date for all the annual reports, which summarize monitoring done the previous calendar year, as well as provide data on operations.

- Jay Pipe Expansion - Ekati Diamond Mine (Dominion Diamond Ekati Corp). The Jay Pipe is located under Lac du Sauvage, and is proposed to be accessed by constructing a ring dike around the kimberlite pipe. Following on the positive Environmental Assessment decision, and water licencing process, finalization of the terms and conditions of licencing is awaited with the receipt of the Minister's decision. In the meantime, some infrastructure early works have been approved and are underway.
- Snap Lake Diamond Mine (DeBeers Canada Inc.) continues to develop closure plans while in care and maintenance status.
- Diavik continues with the construction of the A21 dyke, to allow them to access ore from an underwater pipe. Submission of their Closure and Reclamation Plan is delayed.
- North American Tungsten Limited's Cantung Mine is being managed by the federal government, which has custody and control of the site and is sorting out what plans and licence requirements need to be met in closure status. EEM monitoring continues.
- Fortune Minerals is standing by for development of an access road to the NICO gold mine property. The road access issue is being taken forward by the territorial government with the proposal to construct an all-season road.

- DeBeers Canada Gahcho Kue Diamond Mine started production late in 2016, becoming the third operating diamond mine in the NWT. Their Annual Report is currently out for review.
- The Avalon Rare Metals project is on hold, due to financing.
- Agnico Eagle Mines' Meliadine Gold project is continuing exploration activities, but also constructing water management structures and infrastructure in anticipation of moving to full mine construction in 2017.
- The Giant Mine Remediation project team is exploring remedial development options prior to submitting an updated water licence application. Terms of the long-expired water licence are being respected, and the mine is still complying with the MMER requirements. A call for proposals has been put out for the full remediation project, worth an estimated \$600 million for this phase, which includes freezing of the arsenic trioxide dust underground, along with securing pits, tunnels, tailings ponds, and building demolition.
- Various municipal water licences are being renewed, with site specific evaluations of the terms and conditions, as the Wastewater Systems Effluent Regulations don't apply north of 60°.

- Developments in both territories have submitted Annual Reports outlining operational activities and monitoring; available on the public registries.

Full details for current environmental assessments are available on the Boards' web sites at <http://www.reviewboard.ca/registry> for the NWT, and <http://www.nirb.ca/application?strP=r> for NU, and regulatory files at <http://www.mvlwb.ca/Boards/mv/SitePages/registry.aspx> for the NWT and <http://www.nwb-oen.ca/content/public-registry> for NU.

Closing:

If you are connected to activities in the Yukon, NT or NU, or 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.wilson2@canada.ca.



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Caribou and *Sivumut Abluqta*: Hot Topic at 20th Nunavut Mining Symposium in Iqaluit

Submitted by Sharleen Hamm, CSEB Territories Director

The 20th annual Nunavut Mining Symposium held in Iqaluit in April saw a new session added to the agenda: Hot Topics. This year, the Hot Topic was caribou, and in planning for the session, consideration was given to the Government of Nunavut vision of *Sivumut Abluqta* ('moving forward together') and the Symposium theme of *Reflecting on the Past/Looking to the Future*, with the intent being to host a constructive, forward-looking conversation about caribou and caribou management.

The session heard presentations from four speakers, representing a regional Inuit organization, the regulator, an independent scientist and industry. To focus the discussion, each speaker was asked to address three items in their 20 minute presentation:

- Identify your organization's caribou interest in Nunavut;
- Identify what tools your organization brings to the conversation;
- Identify what your organization needs from other parties involved in the conversation.

Geoff Clark, the Director of Lands, Environment and Resources with the Kitikmeot Inuit Association, illustrated caribou calving occurrence based on collar data and traditional knowledge, and compared these to conservation area proposals and designated caribou habitat polygons included in the draft Nunavut Land Use Plan (2016). He illustrated that caribou have used, and continue to use, areas both inside and outside these designated habitat polygons. Further, traditional knowledge indicates that shifts in caribou habitat are normal, and so advocated for mobile protection measures for caribou calving areas. His requests from other parties included a call to the Government of Nunavut (GN) to use their authority with regards to decision making on caribou conservation, and a request to the GN for enhanced data sharing capacity. Further, he asked consultants for greater self-awareness when practicing to avoid 'value creep' into what should be independent and unbiased advice.

Steve Pinksen, Assistant Deputy Minister, Department of Environment, Government of Nunavut, outlined that the tools that the GN has available stem from their jurisdiction over wildlife management: research and monitoring; permits and licensing; and special management areas. Steve illustrated the extent of the current spatial dataset, based in part on existing collaring programs, and identified a few herds where data are deficient. He expressed the need for an expanded collaring program through increased direct and in-kind support. He also asked for industry's improved compliance with terms and conditions of permits and licences.

Mike Settingington, a Registered Professional Biologist with EDI Environmental Dynamics Inc., pointed to the Code of Ethics and Principles of Stewardship that biologists registered with the College of Applied Biology in BC are responsible to uphold as tools that they bring to the caribou conversation in their capacity as technical experts and independent advisors. He asked industry to better link their environmental assessment to their operations when proposing suitable mitigation measures, and also to

combine resources with industry partners for a more collaborative and holistic approach to caribou research, assessment, and mitigation. He advised that it would be helpful if the regional Inuit organizations would acknowledge uncertainty and risk, provide clarity on land use on Inuit Owned Land, and make Traditional Knowledge available. He asked the GN to engage with stakeholders and to regulate, to take on their management responsibility with regards to obtaining and sharing regional data. To other scientists, he encouraged the development of an improved approach for conducting environmental assessments, and to listen and learn from Inuit Qaujimagatuqanjit.

Stephane Robert, Director of Regulatory Affairs with Agnico Eagle Mines, presented Agnico Eagle's experience with caribou monitoring and mitigation measure implementation in relation to an operating mine. Having found success with adaptive management, such as implementing responsive operational measures and employee training, he advised that more collaring data are needed.

In summary, a number of tools are already available to support effective caribou management: Traditional Knowledge; a robust collaring program; authority, permits, and licensing; accountable professionals; and adaptive management. Progress needs to be made by increasing access to available data; increasing data on certain herds; implementing a more consistent approach to management and mitigation measures; acknowledging management responsibility; acknowledging risk and uncertainty.

Mention was also made that a 'mining roundtable' may be a useful tool to foster engagement and collaboration among all interested parties. I am looking forward to seeing parties 'moving forward together' towards establishing some such organization.

IN Memoriam

Over the past year CSEB has lost three of our long-time members.

Dr. Thomas G. Northcote

It is with sadness that we announce the death of Dr. Thomas Gordon Northcote. Tom Northcote was born in Mission, BC in 1928, and he passed away on April 24th, 2017 in Summerland, BC, where he retired from the University of BC where he taught until 1992. He had a very productive career, for a time directing the research section of the BC Fish and Wildlife Branch, teaching undergraduate and graduate courses in the Department of Zoology, and teaching a forestry/ fisheries interaction course in the Department of Forestry. He was very active in the international community in his field, doing research in Sweden, Peru, New Zealand, Brazil, and Britain. He continued to be active in his field of study, inland waters ecology, in his retirement. In his later years, he began to suffer from dementia, which eventually halted his abilities. His wife, Heather, and their three sons, Gordon, Peter, and Rob, as well as four grandsons, and one great grandson survive him.

Tom received an Honorary Life Membership in CSEB in 2013. His many contributions to CSEB will be sorely missed.

David Albert Snow

November 1, 1959 – April 15, 2017

With heavy hearts, we announce the sudden passing of David Albert Snow on April 15, 2017. He leaves behind his beloved children Alan, Angela, and Jennifer; his mother, Grace; sisters Linda and Catherine (Chris); partner Patti-Lynn Coleman and her children Allison and Andrew; nephew Louis; nieces Caitlyn, Christa, Victoria, and Margaret; work wife and friend Ann Simmons; and a wide circle of extended family, friends and, colleagues. Predeceased by his father, Victor Snow, and brother-in-law, Chris Fisher. A Biologist and Naturalist, David was passionate about all creatures great and small and for their well being. David pioneered environmental tourism in the province and helped establish Newfoundland & Labrador as a cruise destination. Winner of awards such as the Governor General's Award for Conservation and the Heritage Canada Sustainable Tourism Award and multiple National Geographic awards for his company Wildland Tours. Gone to be with Nicky. Resting at Carnell's Funeral Home, Freshwater Road.

Donations are gratefully accepted to The Suncor Energy Fluvarium, The Petty Harbour Mini Aquarium, and to the Wild Things Scholarship at Nature NL.

Donald Joseph Miller Robinson

October 26, 1924 - April 4, 2016

Don died in the early morning hours of April 4, 2016 in the family home overlooking Elk Lake. It was important to Don that the final chapter of his life would be spent in the place that held so many memories and defined much of his life. Don felt a deep sadness as the end neared that he was not able to be together with Fern, to take some final walks and share what they had meant to each other for so, so many years. Don is survived by Fern, but he mourned greatly the loss that came with her advancing dementia.

Don was the proud patriarch of three generations. His memory will be cherished by children Leah (Dan), Don (Cheryl), Christine (Ray), Ian (Rhonda), and grandchildren Ben (Mandy), Kelsey (Ross), Brendan (Madison), Sheldon, Wyatt, Dana, and great grandchildren Lochlan, Ewan, Haden, and another addition this summer. Don is also survived by his brother Alvin.

A true son of Vancouver Island, Don was born in Nanaimo. He would recount with pride that his ancestors logged the forests with teams of oxen and mined the seams of coal underground. He took delight that his great grandchildren represented the sixth generation in his family to be born on Vancouver Island.

There were lots of stories from Don's childhood that he told with a glint in his eye at the fond memories of being that young boy. He kept chickens, ducks, rabbits and fighting roosters and there were many tales of misadventure. His school days were mostly in Vancouver and he graduated from Sir John Oliver at the age of 15. But his real education came in the summers he spent living on a houseboat on Great Central Lake with his aunt Ida and uncles Gunny and Alvin. Alvin and Gunny taught him how to hunt and fish and the ways of the bush. It was a Huck Finn like existence and gave Don's inquisitive mind and boyhood energy

an incredible world to explore. Great Central Lake stood as a seminal place in Don's life.

After the RCAF, Don attended UBC obtaining a BA and graduating with a MA in Zoology in 1951. Don recalled that initially he socialized too much and studied too little. But that seemed to change when he began to notice Fern, who was a friend of his sister. Don decided to pay more attention to his studies and even more to Fern. They were married on February 25, 1950 and it marked the beginning of a whole new life for Don.

The next decade for Don was an eventful one. Children appeared in 1951, 1952, 1955, and 1960. Moves came frequently, Vancouver to Nanaimo, then to Burnaby, and finally Victoria. After being hired by the Game Department in 1951 as the Regional Biologist for Vancouver Island and the Queen Charlottes, he rose quickly to become the Chief Biologist for the province.

Don became the Director of the BC Fish and Wildlife Branch in 1976, a position he held until he retired in 1984. During his tenure, Don was credited with bringing the stewardship of fish and wildlife in British Columbia into the modern era. The position allowed Don to exercise leadership not only at provincial level but also throughout North America, including being the president of the prestigious Association of Western Fish and Wildlife Agencies. In his professional life, those who worked in the Branch, people from other agencies, and importantly, members of local fish and game clubs, always held Don in high esteem.

In retirement, Don continued his contributions to the management of wildlife in the province through his volunteer work with the BC Wildlife Federation. He represented the Federation in many areas including the negotiation of the Nisga'a treaty. Don, through the BCWF, was tireless in his advocacy for the welfare of wildlife in the province and the rights for residents of the province to enjoy that bounty. Don was recognized in 2003 for his work by being named an honorary lifetime member of the BCWF.

Retirement for Don also meant opportunities to travel, particularly to the American Southwest. He and Fern loved the art and natural history of the region and connecting with friends John and Marietta Peters. They also enjoyed boating in the Gulf Islands and time spent with a growing number of grandkids. Don continued his passion for hunting, going on yearly trips with sons and grandsons until well into his 80s. His garden was an enduring pastime, and he delighted in sharing its abundance.

Don was a scientist at heart who had a curiosity about the world that he carried from his boyhood to the end of his life. He read prodigiously and his books bristled with margin notes. He enjoyed books that added to his understanding but also appreciated when authors posed new questions to be pondered. Don was a keen observer, contemplating the world and man's place in it.

Don was of an era where he would be considered a sportsman. He loved the outdoors and the challenges and rewards of hunting and fishing. His skill and knowledge in the pursuit of game inspired awe in his sons and grandsons. In Don's era, the term "sportsman" implied a certain set of qualities that were the core of Don Robinson. He was an ethical, honourable man who brought a sense of dignity to all aspects of his life.

Don Robinson lived a remarkable life and he was a remarkable man.

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