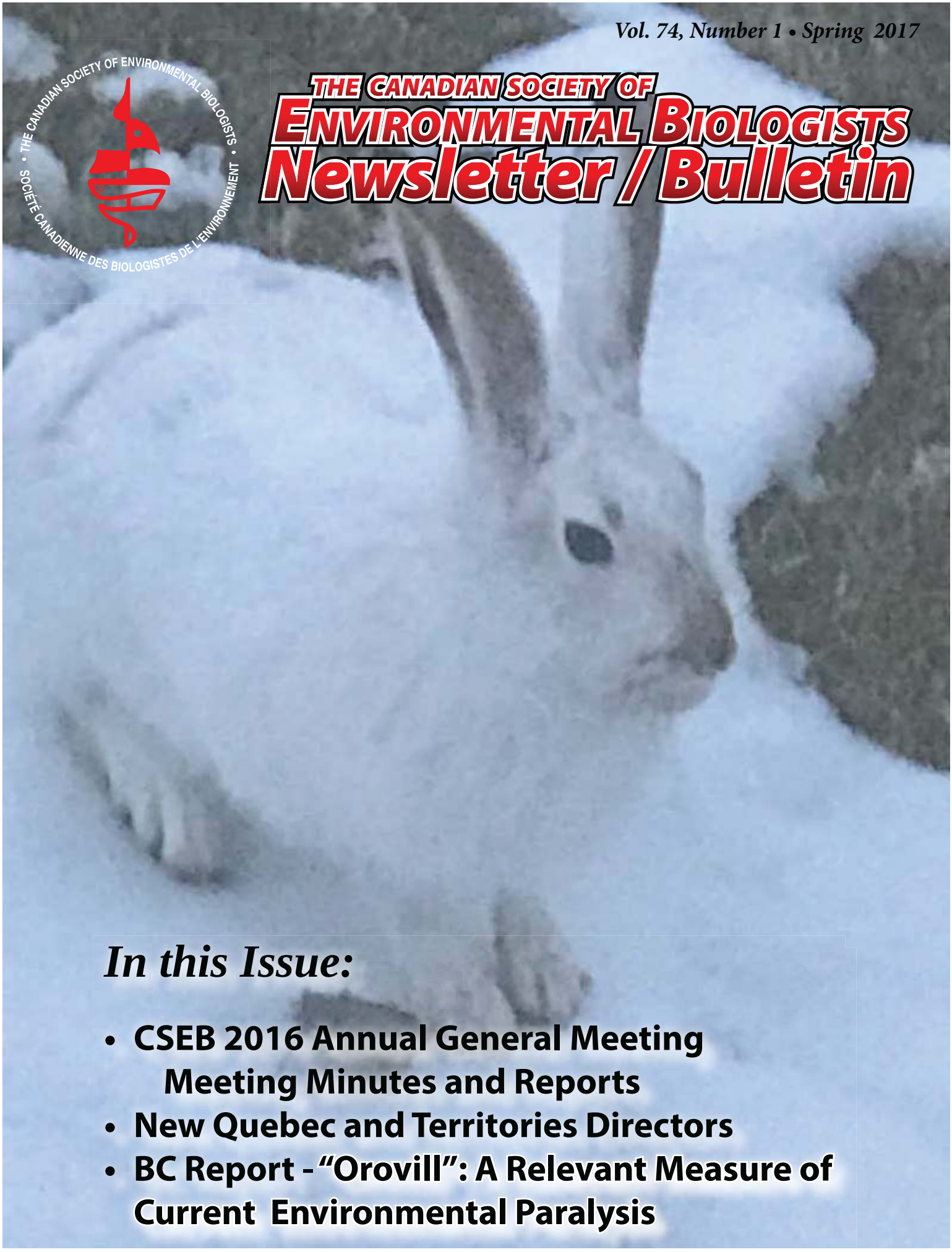
Vol. 74, Number 1 • Spring 2017

THE CANADIAN SOCIETY OF ENVIRONMENTAL BIOLOGISTS Newsletter / Bulletin



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CSEB Newsletter Bulletin SCBE

VOLUME 74, ISSUE 1, Spring, 2017

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In this issue

Date of Issue - February 2017

Printed in Canada ISSN: 0318-5133

Front Cover: White-tailed jackrabbit (*Lepus townsendii*) in Edmonton backyard. Photo Credit: Gary Ash

Back Cover: Main - Lupins, by a trail in Annapolis Royal, NS; Left inset - Eastern painted turtles in a coastal lagoon, Annapolis Royal, NS; Right inset - American Toad, seen next to a trail in Kejimkujuk NP, NS. Photo Credit: Peter Wells, CSEB Atlantic Member

CSEB NEWSLETTER 2017

Vol. 74, Number 1 Spring 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: gash@golder.com**

Editor: Gary Ash

Layout: Gary Ash

Printing: Lasertext Digital Print & Copy Centre, Edmonton, Alberta.

LE BULLETIN de la SCBE 2017

Vol. 74, Numéro 1 Printemps 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: gash@golder.com**

Rédacteur en chef: Gary Ash

Impression: LaserText Digital Print & Copy Centre, Edmonton, AB.

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

Following the 2016 Annual General Meeting of the CSEB (don't let the fact that it was held January 26th, 2017 fool you!), the Board welcomed some new people and some new Directors. The current executive includes yours truly as President, Patrick Stewart as 1st Vice-President, and welcomes Curt Schroeder on as 2nd Vice President. Karen March is remaining on as Interim Secretary-Treasurer, and we are putting a call out for someone to take on that job for the next two year term! We also welcomed Eloise Boileau (Quebec) and Sharleen Hamm (Territories) on as Regional Directors.

There are two main things I would like to build on for 2017. The first is the webinar series, which is showing great success in growing attendance and interest. We will need to continue to line up presenters who are doing high calibre research on topics of wide interest. The other thing on my mind is reversing the drop in membership. To address this, the CSEB needs to provide value to members, and to take an active role in environmental issues. The newsletter and webinars are definitely valuable, and I am open to hearing about issues that the CSEB can provide a voice to take forward.

I am looking forward to working with the new executive and our members!

CSEB 2016 AGM

Draft Annual General Meeting Minutes

26th January, 2017 4:00pm MST

Attendees: Anne Wilson, Gary Ash, Karen March, Loys Maingon, Patrick Stewart, Robert Stedwill, Brian Free, Chris Andrews, Rob Waters, Scott Slocum, Andrea Battistel, Connie Zehr, Jessica Zawalykut, Curt Schroeder

Webinar Presentation prior to meeting

AGENDA – Reports were provided

1. Welcome – Acting President Anne Wilson

Move to accept agenda: Robert S., Second: Loys M., carried.

2. ***Approval of Minutes from 2015 AGM***

Move to accept: Loys M., Second: Gary A., carried

3. President's Report – Anne Wilson

Summary – involved in the difficult decision to cancel the 2016 workshop. The webinar format provides good value for CSEB and opportunity to discuss current issues and bring biologists together, and acknowledged Loys' leadership in launching and running the webinars. Thanks to Brian for progressing the new web site and social media profile. Thanks to Gary for Newsletter efforts.

4. 1st Vice President's Report –Anne Wilson

Summary – primarily participation on monthly teleconferences and promoting activities.

5. 2nd Vice President's Report – Patrick Stewart

Summary – saddened by Bill's passing, noted he was important to CSEB and an enthusiastic environmental scientist. Focus on increasing membership, particularly with local chapters in the region.

6. Secretary-Treasurer's Report – Karen March

Karen presented the Treasurer's report with the 2016 balance sheet presented first. Discussed that the web processing fee should be added to the administration section and that the web site and Citrix webinar-related fees should be separated out. The web site budget will include $350 for software costs as we expect a forms update. It was noted that online payment of the $40 membership fees costs $1.50 per membership, and this charge should be split out as a cost on the expenses list, and will total about $150.00.

Move to accept Financial Report: Karen M., Second: Pat S., carried.

7. Past President's Report – Robert Stedwill

Summary – Remembered Bill's efforts as an advocate for CSEB and our issues. On behalf of CSEB, Robert organized a tree planted in Bill's memory and attended the memorial which was filled to capacity. Helped with webinars, and running of the organization.

8. Membership Report – Gary Ash

Summary – presented a breakdown of membership, noted we need to increase student memberships. There is a decreasing trend line likely due to no conference. Discussion on use of webinar series to generate interest for new members. Loys to add membership information to webinar thank-you emails. Discussion of the need for Chapter meetings to generate membership, and looking at recruiting students from the broader sciences.

9. Newsletter Editor's Report – Gary Ash

Summary of report. Call for guest editors and membership content. Thanks to people for content submission and help with editing. Highlighted need for photos of biologists in action!

10. Webinar Chair Report – Loys Maingon

Summary – four completed to date, planning continues for on-going. Three more are lined up. Noted that it is difficult to get long term commitments. Attendance has been good to very good. Anne thanked Loys for this effort that is paying off to enhance CSEBs reputation.

11. CSEB Website Report- Brian Free

Summary – visits have been good. Gary is getting forms (membership, renewal) upgraded, plus there are other support

costs and software. Please provide content to Brian. Loys noted Facebook page also active and does link to web site.

12. Directors' Reports

Atlantic – Pat S. – maintaining membership in the four Atlantic provinces; but low membership. Members from the region are contributing to the executive, Pat assisted with mailouts to members and with articles.

BC – Loys M.– noted that economics is a government focus and environmental concerns may not be heard. Issues include climate change, LNG/oil pipelines, and other developments.

Saskatchewan – Robert S. – Expect input to newsletter from Curt S. Noted that the decrease oil revenue and government deficit coincided with cuts in environmental protection programs. Will try and grow membership. Discussion on apps for smart phones to communicate with members.

Territories – Anne noted new member and will encourage more as there is a lot of environmental work in the north and CSEB provides good network.

13. Elections – all Positions

Nominations – Anne Wilson for President, Patrick Stewart for 1st VP, Curt Schroeder for 2nd VP, Karen March for Interim Secretary/Treasurer. Loys Maingon to remain as webinar organizer.

Discussion – all to assist with finding permanent Sec/Treasurer and regional directors.

Vote on slate as noted, no objections; carried – Election completed.

14. New Business

Motion for appointment of Eloise Boileau for Quebec and Sharleen Hamm for Territories Directors: Moved by Robert S.; Loys 2nd; carried. Anne to provide bios of new Quebec and Territories directors for Newsletter.

15. Adjournment: 4:30 MST

2015 Annual General Meeting Minutes

8th December, 2015 6:30 pm Eastern

(Minutes Approved at 2016 AGM, 26 January 2017)

Attendees: Anne Wilson, Bill Paton, Gary Ash, Karen March, Loys Maingon, Patrick Stewart, Robert Gainer, Robert Stedwill, Brian Free, Joseph Hnatiuk, Peter Wells

AGENDA – Reports were provided

1. **Welcome** – President Bill Paton
2. **Webinar Presentations***
3. **Approval of Minutes from 2014 AGM**

Move to accept: Robert S., Second: Pat S., all in favour

4. **President's Report – Bill Paton**

Summary – most busy. There was good response on the video, shared with web sites. Thanks to all for contributions, especially Gary for newsletter and Robert for support.

5. **1st Vice President's Report –Anne Wilson**

Summary – Contributed by chairing meetings, minutes and workshop committee.

6. **2nd Vice President's Report – Patrick Stewart**

Summary of report; Discussion on List Serve.

7. **Secretary-Treasurer's Report – Karen March**

Move to accept Financial Report: Gary, Second: Anne, all in favour

8. **Past President's Report – Robert Stedwill**

Summary – Continues in check signing role, helped with workshop planning. Plans to promote for Sask. next year, contribute articles and to connect with new members. Discussion on webinar and opportunity for advertising money and membership engagement.

9. **Membership Secretary's Report – Gary Ash**

Summary of report. Discussion on need to simplify and renew web site and on addressing biology issues to increase membership.

10. **Newsletter Editor's Report – Gary Ash**

Summary of report. Call for guest editors and membership content.

11. **CSEB Website Report- Brian Free**

Summary of report. Noted that it had been over a year since started update. Beta version expected soon and working version by Dec. 16. Content needed. Noted that interactivity needed for new generation and needs to be kept up to date. Discussion on blogs or a forum for local issues.

12. **Directors' Reports**

Atlantic – Pat S. – noted few members and need to organize meetings as well as input to newsletters.

Alberta – Bob Gainer – noted that AB environmental consultants devastated and similar in BC. Professional societies are active with webinars. Consider restoration for future topic.

Saskatchewan – Robert S. – Region not very active - booming and biologists too busy to be involved. Need membership involvement.

Noted that more directors and regional directors needed. Discussion on two year planning cycle need for workshops.

13. **New Business**

Various discussion: Suggestion of web links to professional societies, job board. Web should have national conversations on Canadian issues - Possible issues to highlight – climate change, BC carbon tax.

CSEB to provide information and science on which to make good decisions. Need to generate grass-roots interest. Noted that webinars an opportunity as travel budgets to conferences limited – Loys to follow-up on.

14. **Adjournment: 8:50 EST**

*Webinar Presentations 7:30-8:30

Lake Major Dam—Fish Passage – Patrick Stewart

Hudson Bay, Manitoba- Canada; the Forgotten Coastline – Dr. William Paton

Comox Valley Garry Oak Restoration – Loys Maignon

SECRETARY-TREASURERS REPORT - 2016 FINANCIAL REPORT

Prepared by Karen March

CSEB FINANCIAL REPORT FOR 2016 (Jan. 18 2017 Draft)

Cash in bank as of January 12 2016 (from bank statement*)		$9,682.63
Receipts		
Membership Fees (includes payments to Dec. 28 2016 – 2017 fees)		$ 5,862.60
NRC Journals		$ 1,048.95
Publication Sales (advertising)		*$ 0.00*
Bank Interest		$ 0.00
Contributions		$ 0.00
Total	***ESTIMATE***	***~$6,911.55***

Expenses	
Newsletter Production	$ 709.49
V72.4 – 217.56	
V73.1 – 160.97	
V73.2 – 166.11	
V73.3 – 164.85	
InDesign annual subscription for layout 336.74	
Newsletter Mail-out	$ 409.67
V72.4 – 103.79	
V73.1 – 97.6+5.67	
V73.2 – 28.88 (stamps from previous used)	
V73.3&4 – 97.6+76.13 (check outstanding)	
Membership Renewal (and cards)	$ 459.24
(Chq fwd 0.89+.89+3.1+44.63, ink 141.74, renewals software 262.99, returned chq 5)	
Administration (Board)	$ 0.00
Phone Conferencing ***Preliminary***	$ 666.76
Accutel – 55.56 may; Recite – Sep. – 611.2 (may be more charges to Dec.)	
Note: – AGM cost moved to 2017 as meeting postponed	
Mail Redirect and Mail Box Renewal (May 353.63+ 244.08)	$ 597.71
NRC Journals	$ 1,048.95
Chapter Rebates	$ 0.00
Other (Western Ontario donation 200)	$ 200.00
Web Charges	$ 2356.70
(Web design 550+350; Ninja form 52.31+33.73 chq outstanding, Citrix webinar 1140; Web host renewal 161.35; SSL certificate 69.31 chq outstanding)	
Bank Charges	$ 0.00
Society registration (federal)(KM paid, owed)	$ 20.00
Total	***preliminary ~ $6,468.52***
Difference	*preliminary $443.03*

Cash in bank as of *Dec. 28 2016***	$ *10,378.39*
GIC investment (maturity value as *of Jan. 11 2017*)	*$ 1,602.95*

Bank balances are provided for information purposes.
*Dec. 2016 bank balance does not include Dec. payments for 2016 expenses – Vol73.3,.4
** Pending outstanding checks

SECRETARY-TREASURERS REPORT - 2016 BUDGET

CSEB BUDGET FOR 2017 AND PREVIOUS YEARS EXPENSES (Jan. 20 2017 draft)

	2011	2012	2013	2014	2015	2016*	2017
Receipts							Proposed
Membership fees	$5,700.00	$6,500.00	$6,400.00	$5,000.00	$4,500.00	$5,650.00	$5,500.00
NRC Journals	$1,200.00	$1,400.00	$800.00	$900.00	$1,300.00	$1,000.00	$1,500.00
Publication Sales	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Bank Interest	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Conference Proceeds (incd. Sponsors)	$0.00	$1,500.00	$0.00	$1,800.00	$0.00	$0.00	$0.00
Revenue Generation	$175.00	$0.00	$0.00	$0.00	$400.00	$0.00	$860.00
Total receipts	*$7,075.00*	*$9,400.00*	*$7,200.00*	*$7,700.00*	*$6,200.00*	*$6,650.00*	*$7,860.00*
Expenses							
Corporate registration	$30.00	$30.00	$30.00	$30.00	$30.00	$20.00	$20.00
Newsletter Production	$3,600.00	$2,500.00	$2,400.00	$2,700.00	$1,300.00	$700.00	$1,300.00
Board Meeting (travel subsidy)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$100.00
Administration (conference call, misc.)	$150.00	$750.00	$300.00	$700.00	$600.00	$700.00	$700.00
Web hosting, Update	$150.00	$0.00	$200.00	$650.00	$300.00	$1,260.00	$1,300.00
Webinar	$0.00	$0.00	$0.00	$0.00	$0.00	$1,140.00	$1,140.00
NRC Journals	$1,200.00	$1,400.00	$800.00	$900.00	$1,300.00	$1,000.00	$1,500.00
Postage and Email Newsletters	$1,000.00	$1,000.00	$700.00	$800.00	$450.00	$400.00	$500.00
Mail Box Rental	$250.00	$250.00	$240.00	$250.00	$250.00	$250.00	$250.00
Redirect Mail	$350.00	$350.00	$350.00	$350.00	$350.00	$350.00	$350.00
Chapter Rebates	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Membership renewal, cards, postage	$600.00	$750.00	$500.00	$100.00	$400.00	$500.00	$500.00
Bank and Web Registration Charges	$20.00	$20.00	$20.00	$0.00	$0.00	$150.00	$200.00
Miscellaneous, Conference	$1,000.00	$4,000.00	$30.00	$1,500.00	$0.00	$200.00	$0.00
Total expenses	*$8,350.00*	*$11,050.00*	*$5,570.00*	*$7,980.00*	*$4,980.00*	*$6,670.00*	*$7,860.00*

**** Estimated as outstanding items at time of print (2016 membership includes some 2017 due to web renewals)***
2016 Web hosting includes: Web design 550+350; Ninja form 52.31+33.73, Citrix webinar 1140; Web host renewal 161.35; SSL certificate 69.31
2017 Web hosting includes: Web form update and maintenance 400+350; Ninja form 52.31+33.73, Citrix webinar 1140; Web host renewal 161.35; SSL certificate 69.31

CSEB 2016 AGM Website Report

Presented by Brian Free, CSEB Webmaster

Background

- Design and maintenance using WordPress, a common open-source system.
- Design completed by WanderOak and launched in January
- https://cseb-scbe.org/

Website Statistics, 2016

The Top Five!

- Home page
- Resources page - menu
- About CSEB
- Membership
- Contact

Looking Forward....

- Prepare guidelines
- Add link to Facebook
- More activity re Current Environmental Issues
- Experiment with blogging
- More job ads and job website links?
- Enlist more contributors

CSEB Membership Report

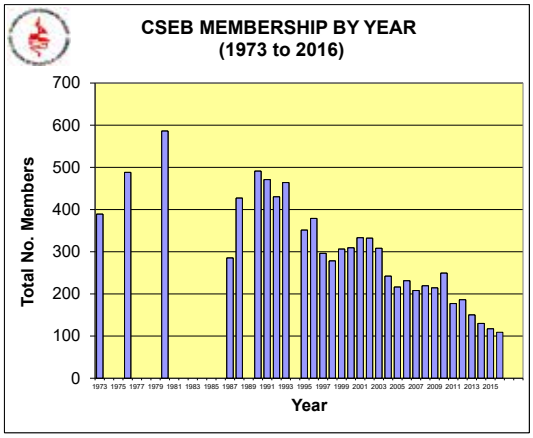
Presented by Gary Ash, Membership Chair

2016 CSEB Membership

by Region and Membership Category

to 31 December 2016

Region	Complimentry	Honourary	Associate	Library	Regular	Student	Total
1 Atlantic	1	1	2	1	5		**10**
2 Quebec					5	1	**6**
3 Ontario	1			1	22	1	**25**
4 Manitoba					3	1	**4**
5 Sask.					13		**13**
6 Alberta		1		2	23	2	**28**
7 BC		2			15	3	**20**
8 Territories					2		**2**
9 USA				1			**1**
O Foreign							**0**
Totals	**2**	**4**	**2**	**5**	**88**	**8**	**109**



CSEB Newsletter Editor's Report

Canadian Society of Environmental Biologist

2016 NEWSLETTER EDITOR'S REPORT

Prepared by Gary Ash

19 Jan 2017

- In 2016, four newsletters were published (Vol 73 issues 1, 2, 3, 4).
- Newsletter distribution format is as follows:
  - Electronic Distribution – 71
  - Hard Copy Distribution – 39 (incl. two copies to National Library of Canada)
- Deadlines for Submissions for Newsletters:
  - Spring 2017 – 15 Feb 2017
  - Summer 2017 – 1 May 2017
  - Fall 2017 – 15 Sep 2017
  - Winter 2017 – 1 Nov 2017
- Currently looking for Guest Editors and submission for 2017 newsletters – Contact Gary Ash (garyash@shaw.ca)
  The newsletter can only be as good as the input of content received.
- Currently looking for photos of Biologists in Action for upcoming newsletter covers
- I would like to especially thank Loys Maingon, Peter Wells, and Anne Wilson for their newsletter contributions, as well as the rest of the executive for their continued help in content submission and help proofing the draft newsletter.

New Regional Directors

Territories Director (term to 2020):

Sharleen Hamm, RPBIO

Ms. Hamm is the lead consultant at Sharleen Hamm Consulting Ltd., providing strategic management advice as well as regulatory and technical support to industry, stakeholders and collaborators in Northern Canada. A Registered Professional Biologist with a background in environmental engineering, Sharleen has over fifteen years of experience working in natural resource management, focusing on projects in Nunavut and the Northwest Territories. Sharleen brings a holistic approach to project management, bridging the gap between technical, environmental and social aspects of any program including those for transportation infrastructure development, exploration and mining, energy and waste management. Sharleen is experienced in water licensing, environmental assessment, project management and aquatic field assessments. She also conducts early and ongoing engagement with regulatory and Aboriginal stakeholders, has worked as a health and safety specialist supporting audits and corporate management systems, and is trained in alternative dispute resolution.

Quebec Director (term to 2020):

Eloise Boileau, B.Sc. Biol. Sciences

Eloise moved to Ottawa from Montreal after earning her B.Sc. degree from the University of Montreal in 2016. Her research experience alongside Dr. Richard Carignan in 2014 helped her develop her passion for biology and botany. Eloise's extensive volunteering experience started in high school with a humanitarian trip to Honduras, but has since shifted towards environmental causes. She volunteered in 2015 for Nature Conservancy Canada to help protect the nesting site of the Map Turtle in her neighbourhood of Brossard, QC. She's an active volunteer for the Ottawa Valley Chapter of the Canadian Park and Wilderness Society, monitoring wildlife surrounding an urban lake in Ottawa. She's currently an active member of the Canadian Society of Environmental Biologists, contributing to the quarterly newsletter.

REGIONAL News

BRITISH COLUMBIA News

By Loys Maingon, CSEB BC Director

"Oroville": A Relevant Measure of Current Environmental Paralysis

On the West Coast, what happens in California is a reliable foreshadowing of things to come at home. Geologically, the 1000 km Cascadian Subduction zone and the terrains associated with it link us to Northern California, whose flora and fauna extend well north of the 49th parallel. Most of BC's residents live in the southern edge which is a climatic extension of the Sonoran desert and Northern Californian ecosystems. Every year, the weather systems that first show up in California make themselves felt along southern BC's coast. When California suffers an extreme drought, BC may not experience the same duration, but it too experiences at least prolonged droughts of three months or more, as we did over the past years. The general consensus is that Canadian weather is shifting to extremes.[1] Over the past decade, BC has experienced unprecedented frequency "pineapple expresses", high winter temperatures and high southern winds that come with record precipitation, which are atmospheric rivers.[2]

The recent dam failure at Oroville, California, brings to public attention the implications of our changing climate, in a way that scientific research and numerous publications over the past three decades have been unable to do. It is a demonstration, not just that North-American infrastructure is ageing and has often reached or exceeded its lifespan, but that the technology, the climate assumptions on which it was based, and the economic assumptions associated with these structures, are no longer viable. As a recent report indicates, about 70% of dams in the USA are over 50 years old, with many reaching their lifespan.[3] Few, if any, of these dams were designed with the challenges in mind that the projected climate extremes are now likely to pose:

> *"That is a national concern for us," said Lori Spragens, the executive director of the Association of State Dam Safety Officials. "Most dams are almost 50 years old. Many of them are very behind in their rehabilitation and they need to be upgraded to current standards. It's the lack of money. The whole concern with infrastructure is just not there, as we know."*

Climate change adds to the challenges. Scientists have said for years that a warming atmosphere should lead to more intense and frequent storms in many regions. In California, where precipitation in the Sierra Nevada is the source of much of the state's water, warming also means that more of the moisture in a given storm falls as water and less as snow, adding to the immediate burden on downstream reservoirs.[4]

In brief, the system of dams developed largely by Governor Edmund Brown in the late fifties, which is the pillar of California's economic prosperity, is now proving to be largely unsustainable. The Californian dam system and building enthusiasm of Governor Brown served as a model for many of B.C.'s dam projects built in the same period of time under W.A.C. Bennett. It is not just the built infrastructure that is no longer up to the challenges posed by climate change, so is the social and intellectual infrastructure that has come out of this prosperity.

There is a growing weariness in the scientific community at the apparent inability or refusal of politicians and the electorate to come to terms with the unsustainability of current practices and the economic model that drives environmental impacts. While the technical capacity to understand and measure these impacts continues to be refined, buzzwords and cosmetic planning programs are constantly elaborated and multiplied to give the appearance that action is being taken. This public relations effort is substantially vacuous, and should only be measured by the outcomes. Those outcomes are the dam failure at Oroville, and the *Biological Extinction Conference* which tells us that 50% of species will face extinction this century.[5] Those are the only real measures of "sustainability."

The sense of a pervasive lack of effective progress grows. As recently pointed out by Harvard's Aaron Ellison with regards to the development of a new metric to measure the rate of deforestation:

"I don't think we need another metric," said Aaron Ellison, a researcher at the *Harvard Forest*, adding that measures of other processes like fragmentation — the breaking of large forests into smaller, disconnected forests — already provide a nuanced picture of deforestation. Decades of scientific knowledge about forest management have not managed to halt clear-cutting and unsustainable development, Dr. Ellison said. To him, the challenge is much larger, and involves altering people's demands for short-term economic gains.

> *"No metric, no matter how opaque or how clear, has made a difference in that discussion during my lifetime," he said.*[6]

The only real no-news in the development of a "forest attrition metric" is that deforestation across the USA is proceeding at unsustainable rates, as it is across all of the planet.

Over the last three months, British Columbia has been treated to a succession of environmental reports and events that should give rise to a similar unease at the general paralysis and insensitivity in the face of a rapidly developing crisis. At a time when British Columbians, like many Canadians across the country, are expressing their lack of confidence in the objectivity of national and provincial institutions charged with carrying out environmental assessments, such as the National Energy Board whose entire structure and operating procedures are currently undergoing a review,[7] the viability of the provincial environmental assessment process has been cast into doubt by the scandal surrounding the Shawnigan Lake contaminated soil site.[8] The judgement recently rendered in BC Supreme Court by Justice Sewell, (January 24), revealed the extent to which the

process and the BC Environmental Assessment Appeal Board's handling thereof, had been extensively corrupted. Justice Sewell determined that: "the board appears to have applied different standards for the admission of opinion evidence from the Shawnigan Residents Association than it applied to evidence from government staff." [9] The three-year old decision by BC's Minister of Environment, Mary Polak, to allow Cobble Hill Development to create and maintain a lucrative holding facility for contaminated soils in the Shawnigan Lake watershed, never received social license and was decried repeatedly by independent environmental scientists and residents alike. Justice Sewell's judgment found that the engineering firm which prepared the environmental reports for environmental assessments had proprietary interests in the project, and was therefore in a clear conflict of interest. Justice Sewell's conclusion is that the case has brought the integrity of the environmental assessment board and its process into question.

In the wake of Justice Sewell's judgement, the minister has been left with no choice but to pull Cobble Hill Development's license, and is now calling for a clean-up of the site.[10] It is, of course, now unclear where the contaminated soils currently on site are to be safely removed, and where those that were expected to be delivered are now to be safely moved.

Contamination and the resulting pollution appear to be a perennial intractable problem in BC, as it appears to be in the rest of Canada. This week, just as Canadians were reminded that the Grassy Narrows, Ontario, contamination dating back to 1970, was back in the limelight, thanks to the work of David Suzuki and John Rudd, a number of events, including the Vancouver Aquarium's "Ocean Watch" report on Howe Sound, brought back to our consciousness the actual lack of progress in either our ability or our will to remediate these two contaminated sites. These two notorious sites which dominated environmental news in the early 1970s, "Britannia Beach" and "Grassy Narrows" might best be referred to as two zones of "national sacrifice," [11] a term developed to designate areas that are so contaminated with at least tacit government approval, that there can be no hope of returning them to pre-industrial conditions. Areas of national sacrifice are not only irrecoverable, they are also excluded from the national consciousness. They are the inconvenient reality of our real impacts on the planet that polite people keep out of national conversations, preferring to treat them as exceptions, rather than the norm. In this case they may well be models for a future norm.

Over the past 50 years, these sites have largely receded from our consciousness. It is remarkable to consider that 50 years on, the problems posed remain largely unresolved, and have been largely absent from the public eye and public discussion. Occasional well-timed public announcements of minor environmental successes, such as returning salmon sightings in contaminated waters, or initial rapid declines in metal concentrations following the covering or removal of a source, or the construction of treatment plants, have largely masked the reality that these sites continue to be regional sources of contamination and remain monuments to our provincial and national disgrace. That they are now returning to public attention may be timely, and inevitable. They are both precursors at a very local scale of the kind of global problems that are emerging from anthropogenic climate change scenarios. As does the Oroville disaster, they point to the limits of our capacity to address the environmental consequences of anthropogenic climate change.

In terms of Grassy Narrows, the chlor-alkali facility was closed in 1970 and the source of mercury was largely decommissioned and "cleaned up" in part by the installation of a water treatment plant to control effluent quality into the river. Following a dilution model, no remediation was undertaken in the sediments downstream. This reasoning was based on the false assumption that the mercury would somehow be absorbed downstream and eventually equilibrate with the Canadian Shield's natural background levels of mercury. As the data in **Figure 1** show, although the closing of the facility resulted in an initial rapid decline in mercury concentrations in the Wabigoon watershed in the first decade, methyl mercury concentrations in game fish levelled out and remain above acceptable levels. About 90% of Grassy Narrows current population continues to show the effects of mercury contamination. As a result, levels of contamination continue to exceed by two to six times the accepted guideline of 0.5 ppm mercury concentrations in walleye and northern pike. Although the "clean-up" initially resulted in a rapid decline in mercury concentration in the first decade, concentrations have not declined appreciably over the subsequent four decades.

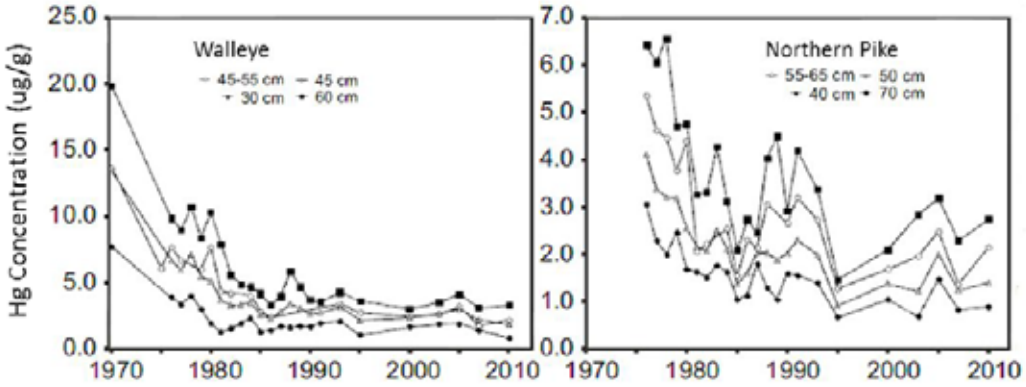


Figure 1: John Rudd et al. (March 21 2016) Advice on Mercury Remediation Options for the Wabigoon-English River Systems. Mercury concentrations in walleye and northern pike of different sizes in Clay Lake, 1970-2010. Modified from Neff et al. (2012)

To a large extent, a lack of follow-up after 1980 appears to be related to a neglect to continue monitoring as rigorously as one might have felt compelled to do, had Grassy Narrows remained a national concern in the public eye. The final report presented by John Rudd and associates (*Advice on Mercury Remediation Options for the Wabigoon-English River Systems*, March 21, 2016) indicates that the problem can be remediated by either armoured capping or hydraulic dredging of large parts of the river bed and Clay Lake, or testing novel technologies, at a cost between $945 million and $1.5 billion. While the authors of the report are optimistic that "remediation of at least some parts of the mercury-contaminated Wabigoon River is feasible," they offer no guarantees that the system can be fully returned to its pre-industrial state, and include as a caveat that their modelling does not include potential climate change considerations.

The situation regarding Howe Sound and Britannia Mines in BC is remarkably similar. The attitude towards it differs only inasmuch as Howe Sound is in a remarkably scenic corridor between Vancouver and Whistler, which has become part of the population density and housing relief zone in the wake of the 2010 Olympics. During the pre-Olympic period, pink salmon were observed in one of the local streams and endangered species, such as pacific tailed frogs (*Ascaphus truei*) and northern red-legged frogs (*Rana aurora*), were also observed. In fact the "miracle recovery" of Britannia Mines seems to have coincided with the development of that area during the pre-Olympic development boom, in part because of the intensive monitoring that took place during the planning and building phase of the "Sea-to-Sky" highway.

Contrary to the somewhat rosy picture presented by some local newspapers, whose real estate advertisers depend on selling the image of a "pristine natural environment", the recent report by Ocean Watch (The Vancouver Aquarium's Coastal Ocean Research Institute) found that the majority of species and habitats in the sound are still "in trouble." Nearly half are in critical danger, while the rest show very low numbers. Of greatest interest is the work done by Golder Associates Ltd. indicating that porewater contamination processes continue to be poorly understood and that heavy metal concentrations of iron, copper, zinc, and cadmium often exceed WQGs between 100 and 125 times.[12,13] Thus while:

> *"...the waters are no longer lethal to fish. The source(s) of recurring high metal concentrations in porewater and intertidal water at some locations near the mine is under investigation, as is the feasibility of future remediation options. It is unlikely that the area around Britannia Mine will ever be returned to its pre-mine state, copper levels may never consistently meet WQG, and risk assessment will be used as a tool to determine what an acceptable end state will be. Even when closure is achieved for the Britannia Remediation Project through a closure plan, there will be ongoing risk management obligations, for example the continued operation of the Water Treatment Plant."*[13]

In both instances, Grassy Narrows and Britannia Mine, researchers explicitly noted that they excluded consideration of the potential effects of climate change on the remediation efforts. It may be worth bearing in mind that much of the remediation efforts are guided by standard engineering considerations. These assumptions represent a mindset somewhat similar to that which has guided both the construction in 1960 and the maintenance procedures at the Oroville Dam up to now. It may in fact be worth considering what some recent climate change research suggests: the new extremes which we are increasingly experiencing is the reality that will constrain everything we do in this century. The new reality of extreme climate change must be incorporated in all infrastructure and environmental restoration assumptions.

The climate events that we have witnessed over the last decade indicate that we are entering into a period of extended droughts followed by extreme precipitation. As research shows, throughout this decade, the Pacific coast has experienced increased tree mortality, which has come in a variety of forms such as the insect infestations of pine beetle, and the fungal outbreak of *Phytophtera infestans,* which has killed about 10 million trees on the coast.[14] Throughout that period, climate models indicate that within the coming decades, we will likely witness a shift in tree species distributions. Until recently, the driving mechanism for this shift had been unclear. Recent research indicates that most trees can survive short periods of extreme moisture and of heat and cold. What they cannot survive is prolonged periods of drought, of three months or more, such as we have been experiencing over the past decade.[15] Not only does lower precipitation result in lower photosynthesis, it ultimately causes vascular problems leading to mortality. Ecologically, tree mortality increases litter, and ultimately this increases carbon loading in aquatic systems.

Vancouver Island and much of the coast are already experiencing the consequences of climate extremes. Areas like the Comox Valley, which depend on a relatively low-elevation mountain reservoir that rarely freezes over, are experiencing increasingly frequent boil water advisories. The rapid and unseasonal influx of cold mountain water associated with extreme rain and snow events, which is no longer retained in the ice caps in the winter period, but enters into relatively warmer reservoirs, is causing unseasonal lake turnovers, which result in abnormal periods of water turbidity. While these turnovers are a nuisance to taxpayers, which can easily be addressed by water treatment, the phenomenon resulting from the shift from extreme drought to extreme precipitation is a much greater ecological concern, because it is related to the natural production of methyl mercury, which enters in food chains.

Conditions that combine an increase in carbon coupled with a decrease in oxygen and increased temperature are the hallmark conditions for methyl mercury (MeHg) production. The development of such conditions in estuaries is yet again a reminder that we live in an ocean planet. The small percentage of total planet waters represented by our freshwaters (3%, of which our lakes and rivers are only 0.3%), is just an infinitesimal distillation of our oceans, which always returns to our oceans. The quality of our freshwaters has to be a concern not just as a source of drinking water, but for the productivity of our oceans, particularly so for the most productive fisheries zone, which is the brackish zone of estuaries and coastlines.

The flux of extreme weather, which challenged all the engineering assumptions behind the Oroville dam, also challenges food production associated with our estuaries. Weather extremes increase the number of annual fluxes and the volume of carbon

that flows into our estuaries. Recent work shows that at a global scale under the projected climate changes, natural organic matter run-off is likely to increase 10-50%. At a conservative increase of terrestrial carbon of 15-30% in our estuaries, under current ocean conditions, MeHg would increase in zooplankton by a factor of 3 to 6.[16] Bearing in mind that Health Canada recommendations for safe fish consumption are currently limited to 150 grams a week for an adult, and once a month for children and pregnant persons, an increase of 3 to 6 times would theoretically place MeHg in coastal fisheries within the current range of fish at Grassy Narrows.

This scenario becomes particularly important to consider since, increasingly, the data show that the oceans are warming and that oxygen levels are dropping significantly (2°C over 50 years), to the point of threatening the viability of top fish species and "sustainable" fisheries.[17] The message seems to be that the shift in climate and weather is a radical shift in biogeochemistry and ecological function, for which we have not planned. It is the measure used "over 50 years" that really draws our attention. For over 50 years, environmental science has grown, but it has been unable to meaningfully change the conversation. The decline in the sustainability of everything from our fisheries to our infrastructure that has happened in the 50 intervening years since Grassy Narrows and Britannia Mine should give a very clear indication of where we were headed. Grassy Narrows and Britannia Mine should have been meta-lessons, in 1970. It is a situation that has evolved as we superficially "moved on" beyond the reality of those very significant events that now come back to haunt us. It is as though we have never learnt from these lessons, because we chose not to pay attention to them, and continued to operate in a reality that shifted very quickly while we stayed stuck in the misleading assumptions of an obsolete paradigm dominated by economic objectives rather than ecological realities.

In BC, it is the economic concern of everything that draws our attention. If the public is truly shocked to learn that 26 First Nations communities in BC have been facing water advisories for over 10 years, although their water sources come from "remote pristine sources," [18] then the public should really be asking some pointed questions about the reality of that "pristine" environment, in "Supernatural BC." It should also consider the effectiveness of the agencies charged to protect the environment, like the NEB, and the Federal and Provincial Environmental Assessment Authorities. And it should consider how much longer we should listen to the hype about sustainability within an unsustainable paradigm, before we are brutally forced to become truly sustainable by facing reality.

To the great concern of our oyster farmers, we continue to produce oysters that the Chinese market rejects because of high cadmium levels, and which Health Canada cannot understand why they are contaminated with norovirus.[19] When the federal government takes belated steps to protect rare glass sponge reefs off Haida Gwai, the Fish Harvester's Federation cries foul at an infringement of its "sustainable" economy.[20] There is still no real climate change plan in BC, and, as Justice Sewell's judgement at Shawnigan Lake shows, assessments don't really need to consider whether the paradigms they operate from match anything beyond their clients' sense of reality.

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ALBERTA News

By Brian Free, CSEB Member

Elk Island National Park is a 194 km^2 park 45 km east of Edmonton. Overshadowed in public profile by Banff, Jasper, and Waterton National Parks in the Rocky Mountains, it has a very unique role in conservation.

It has been managed as a nursery for several key species, using the Elk Island populations to seed other former ranges for wood bison, plains bison, and elk (wapiti). Wood bison have been shipped as far as Alaska and the Republic of Sakha in Russia to introduce that species to former habitats. Elk have been shipped to Kentucky, Tennessee, and North Carolina. The park has also been on the receiving end, with the transfer to the park of trumpeter swans from the Grande Prairie area.

The latest transfer occurred at the end of January with a shipment of 16 plains bison to their historic range in Banff National Park. Bison have been absent from the region for over a century. Ten pregnant cows and six young bulls were transferred to the remote Panther Valley in Banff National Park. For 16 months, the bison will remain in an enclosed pasture in this valley and then released into the 1,200 km^2 area of the Red Deer and Cascade river valleys. This will be a good opportunity for biologists to study their adaptation to these new surroundings and what balance is reached with the park's wolves and grizzly bears.

Another introduction occurred just north of Waterton National Park. Not a returning species, but a new series of public land designations in the area known as the Castle region. Under the provincial government's South Saskatchewan Regional Plan, the Castle Wildland Provincial Park has been expanded, and an adjacent area has been designated as a regular provincial park. Although welcomed by conservationists, there is controversy regarding the closure of some areas to off-highway vehicles that have historically been enjoyed by motorized recreationists. A draft management plan has been released and comments from the public are being sought via an on-line survey. Alberta CSEB members should consider providing their comments! You can check out the plan and survey at https://talkaep.alberta.ca/CastleManagementPlan. Input is being collected until March 20.

SASKATCHEWAN News

By Curt Schroeder, CSEB 2nd Vice President & Sask. Member

Applied Climate Change Tool for Saskatchewan

This project synthesized the long-term climate information provided from the Climate Change Agriculture, and Food Security website (ccafs-climate.org) for the province of Saskatchewan. In the process, it has identified potential stressors locally and provides potential climate change adaptation options at the municipal and national or provincial park levels. This project prepared long-term trends on climate variables, such as temperature and precipitation, and identified potential stressors for city, municipalities and provincial and national parks in the province.

As seen in Figure 1, this project used geospatial technologies and products, such as ArcGIS Online (arcgis.com), and an interface to synthesize the long-term climate trends at various weather stations and future projected climate scenarios and prepared a localized summary for potential application for the local government and the industries in the province. By finding the user's exact location, the mobile application will focus on the current location or allow users to zoom and pan. After this point, the data values of temperature and precipitation forecasted for 2050 will be given. It will use the expertise of Saskatchewan Polytechnic faculty on geospatial analysis and the expertise of an external collaborator on climate change and climate change adaptation.

The approaches taken to synthesize the climate information and development of potential adaptation measures will give the students of the Polytechnic an opportunity to learn how science information is utilized to find an amicable solution to a problem.

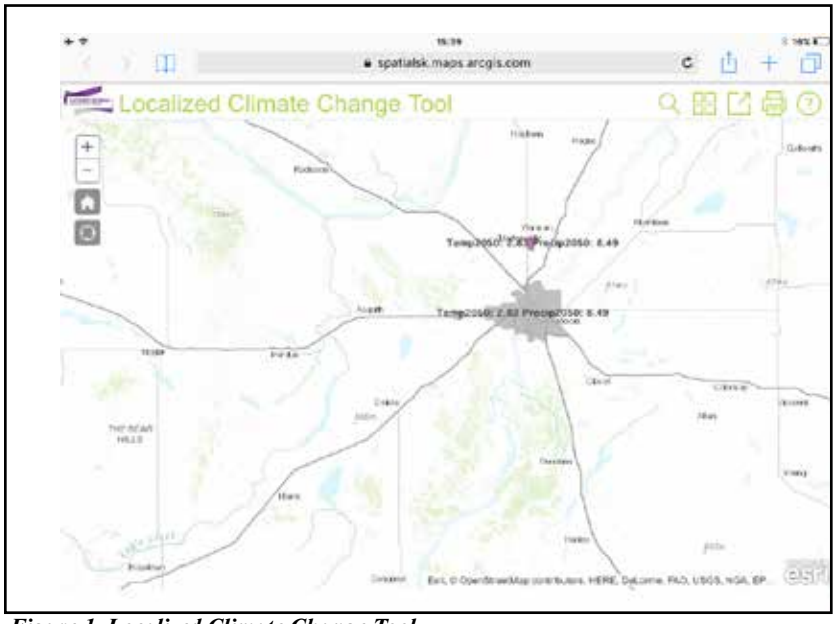

Figure 1. Localized Climate Change Tool

Reference:

Ramirez, J.; Jarvis, A. 2008. High Resolution Statistically Downscaled Future Climate Surfaces. International Center for Tropical Agriculture (CIAT); CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Cali, Colombia.

MANITOBA News

Submitted by Robert Stedwill, CSEB Past President.

Thoughts from Manitoba

With Bill Paton's death last year, our "voice" from Manitoba is no longer available, so I have been asked to put something together. Needless to say, I don't often look to the province east of here with respect to environmental issues; however, a trip to Riding Mountain National Park last fall brought an issue that I have heard little about recently to mind.

You will recall that reports out of Manitoba indicated that zebra mussels (*Dreissena polymorpha*) had been found in the southern basin of Lake Winnipeg in October of 2013. Impacts on water infrastructure and process water systems are well documented across North America, particularly in the Great Lakes and the Mississippi River Watershed. Natural infestation is not surprising due to the mussels' ability to expand across a hospitable range of water body environments. The expansion of the zebra mussel range has been exacerbated by the transfer of the mussels themselves, or their veligers, via the movement of watercraft from one body of water to another, often far removed from the original point of contamination. Such is the concern for Canadian bodies of water as "snowbirds" bring their "watercraft" back from heavily infested areas in the southern States in the spring.

Zebra Mussels (Dreissena polymorpha)

Prior to their discovery in 2013, although the problem was well understood, little concern was expressed in Manitoba, as there was no evident problem, like Ontario and jurisdictions in the United States were experiencing. Hence, few prevention methods were offered to ensure that the problem stayed away. However, once found in Lake Winnipeg, prevention went into effect, and possible eradication solutions were investigated. One such program, which was identified in Virginia as being successful, was to pump liquid potash (a 20% solution of potassium chloride) into temporarily isolated harbours where mussels had been identified, thereby subjecting the mussels to a previously identified and tested molluskicide for a period of one month.

Needless to say, the harbours were off limits for a period of a month in the late spring of 2014 when water temperatures were between 10-12°C, much to the dismay understandably, of recreational boaters and commercial fishers. However, the fishers eventually understood, because, unless the mussels could be eradicated, the entire commercial fishing industry on Lake Winnipeg would be negatively affected.

The experiment was moderately successful, in that the population of mussels that were present were eradicated, but the mussels quickly returned. Unless the whole lake can be treated at considerable expense, *Dreissena polymorpha* is here to stay.

"It's beyond the point now of being able to do anything at all about it," said Eva Pip, a University of Winnipeg biologist who studies water quality in Manitoba's lakes and rivers. She was one of the first to warn the Manitoba government that adherence to a strict detection and prevention program would keep the waters of Manitoba zebra mussel free. With the problem now well established in Lake Winnipeg, a strict detection and prevention program is in place to keep the mussel from spreading further in Manitoba.

My trip to Riding Mountain National Park mentioned at the outset highlighted this program for me. One does not just arrive at a body of water and launch one's "watercraft" (motorized boats, sailboats, rowboats, kayaks, canoes, and yes, even paddle boards and floating devices) onto the water. Failure to obtain the necessary permits following an inspection by a recognized official could result in fines of up to $100 000, which certainly caught my attention! Copies of the permits are carried on one's person, and displayed in the vehicle that carried the watercraft to the waterbody. Although my kayak was clean and dry, due to the fact that it had been in Ontario waters within the last month, confirmation that the Ontario waterbodies were free of zebra mussels had to be established before the permit was issued.

It would appear that Manitoba is now taking the presence of zebra mussels seriously.

ATLANTIC News

Submitted by Peter Wells, CSEB Atlantic Member

Peter Wells has published an article on the iconic Torrey Canyon oil spill that occurred in 1967. Below is the abstract:

Wells, Peter G. The iconic Torrey Canyon oil spill of 1967 — Marking its legacy. Marine Pollution Bulletin 115(1-2)1-2.

Abstract: March 2017 marks the 50th anniversary of the SS Torrey Canyon oil spill and cleanup, off the Cornwall coast in the English Channel. It was the world's first major supertanker disaster. It was a signature event in the marine pollution field, especially related to oil spill response and the initiation of scientific studies of monitoring and researching the fate and effects of oil in the sea. This paper recalls this event, notes our growing understanding of marine pollution and global efforts for cleaner seas, and encourages further work on both oil and the many emerging environmental issues affecting the marine environment.

Be sure to note and submit abstracts to the upcoming 44th Canadian Ecotoxicity Workshop (CEW), Guelph, ON, Oct. 1-4, 2017. CSEB should have a strong presence there, if at all possible, for presentations, visibility, and bringing in new members.

TERRITORIES News

Submitted by Anne Wilson, CSEB President and Territories Director

NWT and NU Regional Update:

I am delighted to welcome Sharleen Hamm on as the second Territories Director! You can read Sharleen's bio in the newsletter. I am looking forward to collaborating with her on newsletter items and any activities we can scheme up!

To me, this is the time of year when we can stop counting winter in terms of months, and (optimistically) start counting in terms of weeks. Temperatures are moderating, and the day lengths are increasing. In Yellowknife, gains are 6 minutes per day, and after the spring equinox the North will forge ahead of the southern parts of Canada in day length – payback for the winter darkness! The long-term forecast for February to April is calling for warmer than normal temperatures for Nunavut, with both territories having normal precipitation levels. Hopefully this bodes well for both cross-country skiing and dog sledding as well as dampening the fire season ahead.

While exploration and development activity in the NWT and NU have slowed down a lot, there are still a number of major projects going ahead. Developments in both territories are assessed for environmental impacts, and later regulated through permits and licences, by co-management boards based on the land claims agreements. The boards do a very good job of balancing the benefits of development with managing the environmental costs through mitigation and monitoring. The latter puts the biologist in a very necessary position – whether it be drilling through 2 m of ice in winter to sample water quality, or monitoring fish and benthic invertebrate populations in August, or surveying caribou populations or vegetation research to inform closure.

Two local news stories are highlighted below, and contrast challenges to maintaining the traditional livelihood of the hunting lifestyle, and the wage economy associated with resource extraction. The communities and Inuit associations acknowledge the employment benefits, and also do well from impact benefit agreements made with the mines. A recent example of NU being "open for business" was seen with the Sabina Back River Gold project, which was refused by the Nunavut Impact Review Board based primarily on concerns for caribou. The Inuit association and the communities of the area all lobbied for reconsideration, and the NIRB has opened up the review again for further assessment of impacts on caribou and water. It will be interesting to see if a different outcome is reached.

And in other news, while a 120 km long gravel road would not be newsworthy or cause for celebration in the south, it is a great event in the North! The Inuvik to Tuktoyaktuk highway will be opening next November, at a cost of $299 million. Built atop permafrost, it uses an elevated road bed stacked over an insulating layer of synthetic material to keep the permafrost frozen. There will be some 65 temperature sensors strung along its length to monitor conditions. The road connects Inuvik, which is connected to the south by the Dempster Highway, with Tuktoyaktuk – for the first time there will be road access to the Arctic Ocean.

Mining and Other Development News

There continues to be activity in the mining industry, although economic conditions continue to affect the resource extraction sector. Ongoing environmental assessments (EAs) underway in the NWT and Nunavut include:

- Agnico Eagle has submitted the Final Environmental Impact Statement for its Amaruq satellite resource ore body, called "Whale Tail" project. This would extend the mine life by several years, with ore trucked to the Meadowbank mill via a 50 km road. Technical meetings and hearings are be scheduled for this spring.
- Sabina's Back River gold project (NU) received a surprise decision from the Nunavut Impact Review Board (NIRB) – it was rejected, primarily on the basis of concerns for caribou impacts. The federal Minister has rejected the report's decision, and a further review is commencing, with hearings in late spring.
- The Hope Bay Phase 2 development proposal is in hand, and involves developing two satellite ore bodies south of the existing Doris North mine. Hearings are expected to be scheduled for summer 2017.
- Prairie Creek Mine (Canadian Zinc Corp.): The road Environmental Assessment continues, with information requests to the company completed, and hearings potentially occurring in late spring. 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.

- 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, the company went through water licence hearings to allow construction and eventual discharge of effluent into Lac du Sauvauge and Lac de Gras. A decision on the terms and conditions of licencing is expected shortly.
- Snap Lake Diamond Mine (DeBeers Canada Inc.) continue 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. Their Closure and Reclamation Plan will be updated by April.
- 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.

- 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 Interim Closure and Reclamation Plan is currently out for review – "begin with the end in mind" is a really good planning approach.
- 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 still apply however, 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.
- Other 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.
- TMAC Resources received their water licence for bringing the Doris North gold mine into production, with the first gold bar poured February 9th.

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.

CANADIAN SOCIETY OF ENVIRONMENTAL BIOLOGISTS
LA SOCIETE CANADIENNE DES BIOLOGISTES DE L'ENVIRONNEMENT

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