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**THE CANADIAN SOCIETY OF
ENVIRONMENTAL BIOLOGISTS
Bulletin**



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- **Waterton National Park and 2017 Kenow Fire**
- **BC Report - Adapting to the Foreseeable “Unforeseen”**
- **Book Review - Riel: *A Life of Revolution***



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Front Cover: Black-tailed deer, a sub-species of mule deer (*Odocoileus hemionus*), in residential back yard in Coquitlam, BC. Photo credit: Gary Ash

Back Cover: Top Photo: Crested Caracara (*Caracara plancus*) in flight, Osa Peninsula, Costa Rica.

Bottom Left: White-throated Mountain-gem Hummingbird (*Lampornis castaneiventris*), Savegre Reserve, Costa Rica.

Bottom Right: Red-headed Barbet (*Eubucco bourcierii*), Braulio Carillo National Park, Costa Rica.

Photo Credits: Larry Hildebrand, RPPIO, RiverRun Consulting, Castlegar, BC.

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CSEB BULLETIN

Vol. 79, Number 3 Fall 2022

The Canadian Society of Environmental Biologists Bulletin is a quarterly publication. The Bulletin 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 Bulletin 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

Vol. 79, Numéro 3, Automne 2022

Le Bulletin de la SCBE est une publication trimestrielle de la Société Canadienne des Biologistes de l'Environnement. Le Bulletin informe les membres des activités de la Société sur événements courants 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

Rédacteur en chef: Gary Ash

Tout texte originale peut être réimprimé sans permission; veuillez l'accréditer à La Société Canadienne des Biologistes de l'Environnement.

The views expressed herein are the writer's of the articles and are not necessarily endorsed by CSEB, which welcomes a broad range of viewpoints. To submit a piece for consideration, email newslettereditor@cseb-scbe.org.

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 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 Curt Schroeder, CSEB President

With the outbreak of the war in Ukraine this past year, the effects of the war on the environment are likely to have unfortunate consequences. As previous armed conflicts show, wars destroy habitats, kill wildlife, create pollution, and restructure ecosystems with impacts that may last decades, not to mention the horrific cost to human lives. Early in the Ukraine war there was concern about the Chernobyl exclusion zone where fires and Russian vehicle traffic may have released radioactive particles embedded in live vegetation and contaminated the area. Ukraine is in an ecological transition zone and home to productive wetlands and forests, as well as containing a large swath of virgin steppe. Critical bird breeding habitats are at high risk, as well as Saiga antelopes in the Askania-Nova reserve, which is occupied by Russian military. Food insecurity and economic disruption may cause poverty rates to rise leading to declines in populations of moose, wild boars, and brown bears. Poaching in nature reserves may become a reality.

Now, there appears to be no end in sight of this armed conflict, but it is already clear that nature will be a loser. Efforts to rebuild and restore impacted habitats and populations will need to be funded and managed, post-conflict, to reverse environmental degradation and return the land and its people to healthy environments.

SCIENCE TIDBITS

Submitted by John Retallack, CSEB Alberta Member

BIRDS

Harper The Heron — Another Long Flight

From The Heron Observatory Network of Maine:

Here are a few details regarding Harper, the Great Blue Heron's long and sustained 2021 journey from Canada to the southern sun:

- Departed Chaleur Bay, NB, around Campbellton on Oct 2nd at 5pm EST
- Flew nonstop for 39 hrs 40 min and 1,173 miles (1,888 km)
- Landed at Flatts Village on Bermuda on Oct 4th at 8:40am EST
- Average speed was 29.9 mph (48.1 kph)
- Maximum speed was 46 mph (75 kph)
- Average altitude estimated at 150 m and maximum elevation was 853 m

- She spent three days in Bermuda before flying another 30 hours to the Bahamas.
- After an eight-hour layover in the Bahamas, she completed the journey back to Guajaca Uno, near Guantanamo Bay, Cuba.
- Total distance of the seven-day journey was 2130 miles (3428 km), mostly over open ocean.

Another Great Blue Heron, named Ragged Richard, was logged on a similar journey last fall and ended up in Haiti after a nine-day journey.

A Mammal Has Been Named as New Zealand's Bird of the Year.

Each year Forest and Bird, an environmental group in New Zealand, stages a competition to select the country's favourite bird and raise awareness of New Zealand's biodiversity and species that are under threat.

In 2021, the group decided to include the long-tailed bat (*Chalinolobus tuberculatus*), aka pekapeka-tou-roa, in the competition since it faces similar habitat and food-availability issues as many native birds. They are particularly vulnerable to predation by introduced species such as rats and stoats, during congregations in maternity roosting trees.

The long-tailed bat received the lion's share of the votes and beat out the second place finisher, the kakapo - a large flightless parrot, by almost 2-to-1.

This is not the first time the contest has flown into controversy. In 2019, hundreds of votes were found to have come from Russia, spurring fears of voter fraud.

The main thing I take away from this event is that New Zealanders have a well-established sense of humour.

Forest Fire Ecological Impacts

Call for Interest

With the large number of extensive forest fires over the last few years, it would be interesting to publish some research on the effects of forest fires (both negative and positive) on biological communities.

If you are doing any research in this area, or know any colleagues doing research on this topic, please consider submitting an article for publication in the CSEB Bulletin. Deadline for the Winter 2022 edition is November 15, 2022.

If interested, please contact Gary Ash, CSEB Bulletin Editor at garyash@shaw.ca

CSEB Biologists Meet Informally in Alberta

On Friday, August 12th, four CSEB members (Gary Ash, Anne Wilson, Brian Free, and Peter Wells, visiting from NS) met in St. Albert, AB, for an informal lunch and discussion about CSEB affairs. Various items were discussed:

- The Bulletin and the need for more contributions from members;
- Status of the new and improved CSEB website;
- Connections of CSEB to other science and environmental groups and their meetings, such as the Canadian Ecotoxicity Workshop (meeting shortly in Winnipeg);
- Important topics to consider for the Society (e.g., the recovery of mountain forests from major fires, such as from the Kenow fire in Waterton National Park in 2017 – ecosystem resilience and recovery – need to engage a forestry ecologist, perhaps from Parks Canada?);
- Building membership and how to do this by getting current members more involved.

The meeting was a very enjoyable get-together, and helped invigorate the members in attendance.

If you are travelling, reach out to other CSEB members and get together to discuss common issues. With COVID and other restrictions to travel (e.g., financial constraints), CSEB has not held an in-person conference in several years, so take any opportunities you may have to meet with other members and discuss how we can make the CSEB better!

Remembering Dr. James Lovelock and the GAIA Principle

By Peter Wells, CSEB Atlantic Member

The world lost a renowned scientist on July 26th, 2022, when Dr. James Lovelock of England passed away at the amazing age of 103 and after a highly productive and influential life. Lovelock was well known in environmental circles for many contributions, the major ones being his invention of the electron capture detector (ECD) and his development and promotion of the GAIA principle that led to the foundation of earth systems science. He was the author of many books (see bibliography) and the recipient of many awards. His writings are well worth noting and a new biography on him is being written, leading on from the excellent biography penned by John and Mary Gribbin (2009). Lovelock's long career covered many areas, from medical science to analytical chemistry to environmental science. On the latter, he encouraged a view of the earth as being one big physical and ecological system, with many connections and feedbacks, a concept he promoted as GAIA. Despite early criticisms from the scientific community, he persisted and now with the global climate crisis upon us, his concept has taken hold and is generally accepted. Read about it in his various books, some of which are below and in the multiple Lovelock commentaries on the web. Perhaps reflect on how a dedicated and persistent scientist changed the way we look at planet Earth during this era of climate change. Along with others such as E.O. Wilson, he should be an inspiration to us all.

Back Cover Photos

Submitted by Larry Hildebrand, RPBiol., Castlegar, BC.

The birds shown on the back cover were photographed during a 17 day guided bird watching/photography tour my wife and I took in Costa Rica this past spring. Costa Rica has long been renowned for its incredible biodiversity; a small, yet environmentally rich country that is home to over 5% of the entire world's animal and plant species.

During our tour, we explored five different biogeographic zones that started at the Caribbean Lowland rainforest near the La Selva Biological station, a rich ecological area that hosts more than 470 species of birds plus thousands of other species (mammals, amphibians, reptiles, plants, and insects). We then travelled back across the Continental divide to Mount Arenal, a "currently inactive" volcano and stayed at the Mount Arenal Observatory Lodge, a sustainable eco-lodge. More than 500 species of birds can be found on the grounds and surrounding forest.

Next we went to the Central Pacific coast at the Hotel Villa Lapas, surrounded by 500 acres of private lush tropical gardens and rainforest. The area is adjacent to the Tarcoles River estuary where we took a boat tour and observed 4 m long American crocodiles plus over 40 species of birds in a one hour trip. Next we drove to the town of Sierpe along the Pacific coast where we took a two hour boat trip to the Osa Peninsula. We stayed at the Corcovado Jungle Lodge, a remote, authentic, and unforgettable destination. The Osa Peninsula is home to half of all the species in Costa Rica and has been dubbed by National Geographic as the most biologically intense place on earth. Approximately 2.6% of the world's total biodiversity can be found in this tiny strip of land measuring just 56 km long and 32 km wide (a mere 0.0000085% of the earth's total surface area) and covered in unspoiled rainforest.

If you get the chance, I highly recommend you visit Costa Rica, a biologists paradise!!

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Challenges For Science and Society in an Era of Rapid Environmental Change – The Legacy of the 1972 Stockholm Conference/Declaration and the Continued Role of Environmental Biologists¹

By Peter Wells, CSEB Atlantic Member

Science has been the key to the human and social enterprise of the 19th and 20th centuries (Dubos 1970). It has shaped the modern world at a time of a major population increase, brought on by better living conditions and medical care, vaccines, and the increase in available food. At the same time, there have been continued human tragedies as a result of wars, pandemics, mass migrations, and starvation related to social unrest and localized food shortages. Despite such challenges, much progress to improve the human condition since WWII has been facilitated by the United Nations and its many front-line agencies.

On this theme, it is worth reflecting back 50 years to the pivotal conference on the environment, held in Stockholm, Sweden – the 1972 United Nations Conference on the Human Environment (Ward and Dubos 1972). It was the first of its kind to discuss the environment from a global humanities perspective. It came as a result of the waves of public concern about the natural environment that began in the 1960s. This was spurred on by the over-riding threat of global nuclear war, an awareness of the spread of persistent, bioaccumulative toxic chemicals (Carson 1962), including the tragic use of Agent Orange (a herbicide with dioxins) in the Vietnam war, and as already mentioned, concerns about the implications of a rapidly increasing human population, at that time being 3.5 billion (Ehrlich 1968; Regier and Falls 1969; Meadows et al. 1972; amongst others) and now close to reaching an alarming 8 billion people.

At the Stockholm conference, in addition to important discussions of the above global concerns, it was already noted that rising CO₂ levels from man's activities could lead to a significant rise in the earth's temperature, from 0.5 to 2 °C, i.e., climate change (Ward and Dubos 1972), a frightening prediction now verified. This conference helped to put the environment on the political agenda and encouraged many countries to establish environment departments (e.g. Environment Canada was set up in 1971). It also led to the establishment of the EPA in the USA, the United Nations Environment Program (UNEP), and important conventions such as MARPOL '73/78.

The Stockholm conference was successful by most accounts in the literature. "The participants adopted a series of principles for sound management of the environment including the Stockholm Declaration and Action Plan for the Human Environment and several resolutions. The Stockholm Declaration, which contained 26 principles, placed environmental issues at the forefront of international concerns and marked the start of a dialogue between industrialized and developing countries on the link between economic growth, the pollution of the air, water, and oceans and the well-being of people around the world" (<https://www.un.org/en/conferences/environment/stockholm1972>).

Since 1972, there have been many follow-up international meetings, often led by the UN, notably Rio 1992 (producing Agenda 21), Johannesburg in 2002, and Rio 2012 (PEW Environment Group 2012). Progress has been made on some issues, less or none on others. There is a follow-up meeting this year in Stockholm, celebrating its 50th anniversary and emphasizing the need for more urgent action on a range of environmental problems, many of which remain the same, though climate change has finally climbed to the top of the list!

Much more needs to be done and done on a continuous basis. This is especially true where land and water pollution, habitat (e.g., forests) and biodiversity loss, the spread of invasive species, freshwater shortages, and rapid climate change continue unabated (e.g., WWF 2017), despite much effort over the past five decades.

Fortunately, in recent years in the western world, public figures and writers such as Attenborough (2020), Suzuki (DSF 2008), and many others (e.g., Wallace-Wells 2020; Wilson 2016; Wadhams 2017) have kept the major environmental issues and opportunities in the public eye, despite other problems that face us (e.g., inflation, new wars, the global COVID pandemic, food shortages, and mass migrations). Caring for the environment and for species other than ourselves is now seen by most public figures to be in the public interest but it is a constant and seemingly overwhelming challenge to maintain this focus. It is difficult to stay optimistic (Attenborough) and easy to be completely overwhelmed and pessimistic (Wallace-Wells). Perhaps we should all adopt the philosophy of "the despairing optimist" (Dubos 1970) as one must have hope for the future, despite the challenges.

Noting the contribution of the pivotal 1972 Stockholm conference should be of interest to members of the CSEB and perhaps aid its future programs. How can CSEB build on the momentum brought on by Stockholm and subsequent conferences over the past 50 years? How can we continue to bring the key environmental issues, challenges, and discussions of solutions more effectively to public attention? More importantly perhaps, should we individually and collectively be spending more time and effort to productively engage other citizens, especially politicians and decision makers at all levels of government? How can we more effectively consider and debate the key issues related to how science, especially biological and environmental science, can better serve society in these very turbulent times? How can the CSEB track progress and work to speed up the process towards solutions?

To ignore the perilous state of the environment, especially climate change, and not to act individually and as an organization is to compromise the well-being of our children and future generations! Climate change in Canada must continue to be seriously addressed and without delay, along with other environmental issues. All of them demand public and political attention and an active interplay of science, information, policy/decision making, and timely and effective management (see www.eiui.ca, and Wells 2021). Engagement of CSEB members and open discussion of our individual and combined roles, in one or more of our webinars,

¹ This article builds on an editorial penned mid-summer for the PNSIS, Vol. 52, Part 2, 2022 (Nova Scotian Institute of Science). The original article can be found on the NSIS website (www.nsis.chebucto.org).

might show if we are being relevant and successful, in the spirit of the 1972 Stockholm conference and its goals. Let's rally the CSEB, assess what the Society has accomplished and where we now stand, and collectively continue to contribute through our science, information transfer, and action for a healthier and more sustainable Canada and world.

Acknowledgements: Several colleagues in Nova Scotia are due many thanks for their helpful reading of the original PNSIS article.

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Waterton National Park and the 2017 Kenow Fire

By Peter Wells, CSEB Atlantic Member

I have just returned from a short hiking holiday in Waterton National Park, my last visit there being in 2016. As the reader likely knows, in early September of 2017, a major forest fire originating in south-east BC swept into and through the park, burning 38% of its forests (see Parks Canada website) and coming very close to destroying the town of Waterton itself, including its iconic Prince of Wales Hotel. On this year's visit, I was impressed by the dramatic change in scenery as the fire destroyed the forest canopy/green growth in whole valleys and on the mountains and lake sides near the town. It opened up whole swaths of mountain side to otherwise hidden views.



Fig 1. The trail up Bears Hump, on the outskirts of Waterton townsite, July 27, 2022.



Fig 2. The forests along the road to Cameron Lake, Waterton National Park, July 28, 2022.

The park now has a new stark beauty of its own as it recovers, and as such, it is certainly not spoiled as a tourist destination. There are expanses of new vegetation in the forest under-story, abundant alpine flowers, and small coniferous trees along the trails and throughout the tangled remains of the forests. I watched a mother bear and her

sub feeding on vegetation in a burned-out tree stand. A thought occurred - surely there is a project waiting here for one or more of the biologists in the CSEB – to assist the park ecologists and/or to work independently studying the resilience and recovery of the forests and their wildlife after fire events. This subject is completely outside of my area of expertise but it strikes me that there is an opportunity for us collectively to think about and study the ecological resilience of montane ecosystems, given climate change and the increasing risk of summer fires.



Fig 3. The forests along the road to Cameron Lake, Waterton National Park, July 28, 2022.

Some other park forests in western Canada have been burned out in previous years, notably in Kootenay National Park; they are “recovering”, apparently on very long timelines. Fires are part of the natural mountain ecosystem, have been largely suppressed since colonization (making the forests more susceptible to burning), and are likely to become more frequent with warmer and drier summers. Does the CSEB have a research or communication role on this topic of “fires in mountain ecosystems – occurrence, impacts, and recovery timelines”? What are the short and long-term impacts on wildlife? Is it worthy of discussion, perhaps in our webinar series? Could we invite a Parks Canada scientist to give a talk? If interested, your opinion should be sent to the CSEB Chair for consideration (schroederc@saskpolytech.ca).

BIOLOGICAL TEST METHODS FOR CONTAMINANTS – NEW ECCC PUBLICATION

The Method Development and Applications Unit of ECCC is pleased to announce the publication of *STB 1/RM/43 Biological Test Method: Tests for Measuring Avoidance Behaviour or Reproduction of Earthworms (Eisenia andrei or Dendrodrilus rubidus) Exposed to Contaminants in Soil – Second Edition*.

This revised method supersedes the first edition of this document published as EPS 1/RM/43 in June 2004 and revised in June 2007.

The second edition method is currently available online in both HTML and PDF formats, and will be available in print during Fall 2022:

English:

<https://www.canada.ca/en/environment-climate-change/services/wildlife-research-landscape-science/biological-test-method-publications/avoidance-behaviour-reproduction-earthworms-contaminants-soil.html>

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<https://www.canada.ca/fr/environnement-changement-climatique/services/recherche-faune-science-paysage/publications-methodes-essai-biologique/reaction-evitement-reproduction-vers-terres-conaminants-sol.html>

This method provides detailed procedures, conditions, and guidance for preparing for and conducting each of two discrete

biological test methods (reproduction inhibition and avoidance behaviour) for measuring soil toxicity using earthworms (*Eisenia andrei* or *Dendrodrilus rubidus*). Significant changes from the first edition include: 1) guidance for the collection, handling, and testing of soils; 2) the removal of two test species (*Eisenia fetida* and *Lumbricus terrestris*); 3) the addition of another test species (*Dendrodrilus rubidus*) specifically for testing soils from the boreal or taiga ecozones; 4) revised test designs; 5) updated guidance for culturing and testing; and 6) improved guidance on statistical analysis of data.

Also of note, due to a lack of sensitivity relative to the reproduction test, the 14-day acute lethality test has been removed as a test option.

All of the methods documents of this Unit of ECCC, prepared and published over many years with the input of IGETG members, are available at: <https://www.canada.ca/en/environment-climate-change/services/wildlife-research-landscape-science/biological-test-method-publications/>

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Edited and submitted by Peter Wells, CSEB Member and Emeritus Member, IGETG (Intergovernmental Ecotoxicology Testing Group)

Upcoming CSEB Research Webinar

The next CSEB Research Webinars series will be held in the fall, as many biologists are out conducting field work, and others are on vacation during the summer.

Check the [CSEB Website](#) in September for the dates and times of the fall series of webinars.

If you are willing to give a webinar on one of your monitoring or research programs, or have suggestions for future webinars, please contact Dr. Loys Maingon at tsolumresearch@gmail.com.

CSEB VOLUNTEERS NEEDED

Social Media Coordinator:

CSEB requires a volunteer to manage our social media (e.g., Facebook, Twitter, etc.). The volunteer should be familiar with social media, have a good command of the English language, and willing to spend the time to post new items, keep the social media current, and communicate with our members. Awareness of environmental biology issues would be an asset.

If interested, please contact President Curt Schroeder at schroederc@saskpolytech.ca.

Regional Directors

CSEB Requires Regional Directors for the following Regions:

Alberta (1), Saskatchewan (1), Manitoba (2), Ontario (2), Quebec (2), Atlantic (1), and Territories (2).

Duties involve promoting CSEB in the Region, participating in monthly Board conference calls (1 hour/mo), and providing regional news for the CSEB Bulletin four times per year.

For more information, contact President Curt Schroeder at schroederc@saskpolytech.ca.

REGIONAL News

BRITISH COLUMBIA News

Submitted by Loys Maingon, CSEB BC Director

Adapting to the Foreseeable “Unforeseen”

“-We increasingly understand that our planet is a more sophisticated and fragile organism...”¹

- John Rockstrom

We live in hope that a majority of humans understand what John Rockstrom just said, because it would confirm a much-needed radical change in values and perceptions, much heralded by the ICPP since the release of its 2018 report.² The lead editorial in August’s *Nature Plants*, entitled “Plant Deafness,” reviews the growing body of research on plant communication and sentience. It too gives one cause for hope.³ Progressive, enlightened scientific work providing a new insight into what the late E.O. Wilson would have called the genetic kinship of mankind to biodiversity, which was anathema only a few years ago, is changing how science understands life on this planet and reconciling ideological chasms that have separated mainstream post-industrial Western culture from its folk cultures, Humboldtian science and aboriginal cultures.

That is unfortunately also a measure of the intellectual distance yet to be forded by politicians and their electorate. In BC, the most significant and shocking environmental news this summer was the partial settlement reached by the West Moberly band with provincial and federal governments over Site C. There is no doubt that, aside from the ecological destruction that the Site C project represents, it is also a clear violation of the Moberly band’s territory and culture, and of all of the Crown’s obligations set out under Treaty 8 and UNDRIP. Both the provincial and federal governments have publicly made much hay of their claims to profound commitments to UNDRIP. Site C is a reality check for the actual depth of those commitments. As Chief Roland Willson tactfully put it: “*We’ve, as a community, come to a realization that they’re not stopping,*” he said. “*[We’re] painfully aware that we’ve lost the valley.*”⁴ While the courts fiddled, BC Hydro has been allowed to continue the environmental destruction of the site, making any claim moot. After years of legal wrangling, short sightedness, money, power, and political dishonesty have bullied their way. Significantly, this is the destruction of one of BC’s few agriculturally rich regions. It comes at a time when climate change has highlighted the importance of food security as California’s productivity wanes with a trend-setting drought that is transforming the West Coast.

The settling of Site C is another Hetch-Hetchy in which the consumer-demands override our obligations to a fragile planet. The O’Shaughnessy dam that was completed in 1923, less than a century ago, destroyed one of Yosemite’s most beautiful valleys to provide water to the then 500,000 citizens of San Francisco. This heralded the growth and industrialization of one of California’s largest urban centres. It marked a shift in the development of

California from a largely rural and agricultural economy to an industrial and technological manufacturing powerhouse, and heralded the growth of suburban planning that now dominates California and much of North America.

This shift has bearing, at a federal and provincial scale, on the actual reality of the noises that governments and mainstream environmental bodies make around the world. The environmental and social problems we now face are a product of the dysfunctionality of a largely urban and industrial understanding of our world as a “demand and supply machine.” We are at best in a moment of transition, or at worst, in a period of “societal exhaustion.” That is becoming evident not only in the arts but also in the sciences. There is a general social disorientation caused by the mixed and often contradictory messages of mainstream media. The IPCC and the United Nations may talk about the need for “transformational change,” but politicians and their electorate just want ways to maintain status quo. As in the last years of ancient Rome, politicians and citizens yearn for circuses to better avoid reality.

It is refreshing to note that — albeit after four decades — on July 9th of this year the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services issued a formal statement signalling out this problem in its “Key Message 2” of the “Summary for policymakers of the methodological assessment of the diverse values and valuation of nature:”⁵

“Despite the diversity of nature’s values, most policymaking approaches have prioritized a narrow set of values at the expense of both nature and society, as well as future generations, and have often ignored values associated to indigenous peoples and local communities’ worldviews (A4, A8, A9, B10, C1, C3).”

The problem with this statement is not only that this logical recommendation is not new, but that it misses the opportunity to identify, as predecessors such as James Lovelock did, the basis of the “narrow set of values” in urbanization and the growth of a global urban ethic associated with the economic interests of, the aptly named “The City”, be it in London, New York, Hong Kong, or any other financial centre of national urban interest.

In December, Canada will hold COP 15 in Montreal, doubtless with much fanfare in the media.⁶ China has abdicated its international obligations to host the Convention on Biological Diversity. In the light of the handling of decisions like Site C, it is worth questioning whether Canada is really any more serious about stated commitments to biodiversity than China or most of the world’s nations. One of the recently released reports for this convention highlights that the extinction of trees, largely due to deforestation and climate change, endangers about one third of the planet’s tree species and their associated flora and fauna.⁷ Will BC send delusional representatives from the Ministry of Forest, Lands and Natural Resources, and the universities to make more

unsubstantiated claims of commitments to protect biodiversity, while continuing to clearcut and leaving the Old Growth Strategy in abeyance? How can provincial and federal governments who repeatedly *“ignored values associated to indigenous peoples and local communities’ worldviews,”* even pretend to take the IPBES seriously?

Experience suggests that COP 15 will be another international circus of political pronouncements and environmental grandstanding by the jet set of environmental organizations as they gather—once again—in large urban venues to make commitments that are never to be met, because they are at odds with the priorities of urban majorities.

We know the complexity of the problems that beset us, but we would like to pretend that facile re-branding will make them go away. Government and industry policies are often at odds with what science has been telling us for the past five decades about the unfolding reality around us. There is a disconnection between the social crises of democracy and war, and the unfolding climate and biodiversity crisis. In the same way that cities and suburbia are partitioned from nature, only convenience separates the cultural problems from the environmental problems. The war in Ukraine over the gas-rich Azov Sea, the oil and intractable gas dependency of Europe, the resulting global increase of oil and gas production, despite talk of energy transitions, climate justice, climate change concerns, and biodiversity collapse, are all one intimately linked long-standing problem of how we understand the planet and mankind’s relationship to it. “We” would rather not agree with Rockstrom. The circuses need to go on forever.

These social and environmental crises are manifestations of a disconnect in humanity’s mental models of the world and our inability to reconcile them. Although the problems are articulated by using the same terms (“sustainability,” “resilience,” “biodiversity,” “pollution,” etc.), the referential frames of the models are so radically different from one another as to have different significance for different social groups. The endless stream of “Conferences of Parties” and environmental pronouncements of politicians and environmentalists alike are a modern Tower of Babel. An effective response to social and environmental problems does not depend only on a shared terminology adapted to the world’s linguistic communities. It depends on a shared narrative of the reality we face and the ensuing problems we experience.

Mainstream politics and economics refer to climate change and associated ecological and environmental problems as “resource” problems external to a largely urbanized and industrialized human society that experiences life in isolation from nature. For the past five decades, science has been increasingly shifting our understanding of a living planet in trouble in which human culture, economics, and technology are no longer the inevitable pinnacle of evolutionary progress entitled to exploit “endless resources.” As “America’s first environmentalist”, William Perkins Marsh (1801–1882) correctly argued in his now classic environmental history *Man and Nature* (1864), cultures are only codifications of human relationships with nature, and their success is a measure of their respect for nature. Cultures and their economies are subordinate products of life on a planet that they now threaten.

A recent report for the National Academy of Sciences notes that it is time to move beyond the implications of climate change and biodiversity collapse for general species extinction. It is now time to give serious consideration to “the mechanisms that could give rise to human mortality and morbidity.”⁸ As one of the authors, John Rockstrom, the director of the Potsdam Institute for Climate Impact Research, notes in the introductory quote to this essay, the apparent intractability of the climate problem stems in large part from the failure of most of the industrialized world’s population to understand that the world is not an automatic telling machine, which affluent members of the public can pillage at will. These days, talk of collective suicide abounds for good reason.⁹

Rockstrom, inadvertently, bears witness to the greatness of the late James Lovelock (1919–2022) who passed away on July 27th of this year at the age of 103. For the disciplines of biology and the earth sciences, Lovelock is perhaps the most influential thinker since Darwin. Fifty-four years after Lovelock first introduced the concept of “Gaia” to a largely skeptical audience of scientists at Princeton University: “... as a complex entity involving the earth’s biosphere, atmosphere, oceans and soil: the totality constituting a feedback or cybernetic system which seeks an optimal physical and chemical environment for life on this planet,”¹⁰ the scientific community has largely come to accept, as Rockstrom puts it, “the planet as a sophisticated fragile organism.” When the IPCC and the IPBES find it necessary to issue joint statements re-affirming that the climate change emergency cannot be solved if the biodiversity emergency is not addressed,¹¹ that too is a recognition that complex biodiversity enables and sustains complex biogeochemical processes necessary for life as we know it on Earth.

The IPCC and IPBES recognition of their interdependence in 2021 is also a reaffirmation of the Gaian principles articulated in the collaborative work of James Lovelock and Lynn Margulis five decades ago. Gaia was, from the beginning, put forth as a web of life that is not a simple product of its environment. Instead, Margulis and Lovelock, returned to von Humboldt and proposed that organisms create their environments. Species diversity creates and maintains the conditions necessary for a self-sustaining environment: “... the hypothesis that the entire range of living matter on Earth, from whales to viruses, and from oaks to algae, could be regarded as constituting, a single living entity, capable of manipulating the Earth’s atmosphere to suit its overall needs and endowed with faculties and powers far beyond its constituent parts.”¹²

It is also a recognition of a problem clearly identified as early as 1979 by Lovelock that science itself has long been held captive by the logic of perspectives that come from urban and urbanized life, too often to the detriment of rural values and perceptions. As he presciently noted: “Scientists are usually condemned to lead urban lives, but I find that country people still living close to the earth often seem puzzled that anyone should need to make a formal proposition of anything as obvious as the Gaia hypothesis.”¹³ In this, Lovelock echoes the problem of “urban ethics and history” long recognized by social theorists, historians, and philosophers. Cities have evolved from antiquity to be culturally partitioned or walled off from the country. Cities depend on the regular destruction and consumption of nature.

From the walled cities “nature” is a threatening hostile wilderness to be tamed. Nature is the wilderness on which the city depends for resources. Our ethical tradition is based on “urban ethics” distinct from and hostile to “wilderness ethics.” In the urban framework, nature is seen as just a resource pool in the same way that “the countryside” provides economic and ecological services that sustain the city. Even the most progressive urban planning today reflects that utilitarian urban bias. Integrated Watershed Planning remains blind to its urban biases and only considers nature worthy of ethical consideration inasmuch as it provides “ecosystem services” to urban centres. The deplorable state in which we now find nature is a testimony to over a century of the mismanagement of nature from urban mindsets.

“Country,” as Australian aborigine and rural communities understand it, is much more than “ecosystem services” for urban consumption. It is a living entity to which one has ethical obligations. The concept of obligations may seem alien to an urban consumer society focused on individual rights, but it is well-known to rural communities where survival depends on respect and interdependency of neighbours and neighbourhood. As any reader of the late Stan Rowe’s *Earth Alive*, or Wendell Berry’s *The Unsettling of America* should know, the ethical *weltanschauung* of “country” is not uniquely aboriginal. It is very much part of the complex tapestry of Western culture which is too often forgotten and cancelled as a grotesque caricature promoted in contemporary academic circles.

The limitation of urban ethics is in fact one of the cornerstones of Hans Jonas’ formulation of “the precautionary principle” in his seminal work *The Imperative of Responsibility* (1979). That essay launched the scientific concept. Jonas argued that the precautionary principle was necessary because urban ethics had severed our bond to nature. Subsequent commentators invoking the precautionary principle have all too frequently tacitly overlooked this ethical cornerstone and its importance. To invoke the precautionary principle, without questioning, or rejecting, our urban ethical mindset has repeatedly made a mockery of the precautionary principle. Without an awareness of its ethical cornerstone the invocation of the precautionary principle becomes yet another vacuous placebo. It becomes just a call for change with no real understanding of how to change.

The problems posed by our disconnection with nature have only grown with the all-pervasive urbanization of the planet that has come together with a globalization of the economy. As Wendell Berry has argued for the last five decades, much of rural North America has been transformed into one unending suburb. To talk about “the precautionary principle,” as many politicians and urban scientists do all too frequently without understanding, or even being aware of the parochialism and historical limitations of urban ethics, is to fail to really understand that the precautionary principle itself is a call for “transformational change.” The precautionary principle forces one to reckon with the limits of urban assumptions, not to do so just perpetuates the problems at hand.

The IPCC and countless United Nations’ pronouncements have told us over the past four years, and it seems that the media agrees, that we must make “transformational changes.” To gauge our understanding what that means, and whether we are rising to the

challenge of climate change, it is worth considering whether we are really making the necessary changes.

Earlier this month, the new leader of the opposition, Kevin Falcon, who heads a party desperate to erase its past and rename itself, fired from his caucus an MLA, John Rustad, for posting social media posts repeating the climate change denial misinformation of past Greenpeace founder Patrick Moore.¹⁴ John Rustad served as Minister of Aboriginal Relations and Reconciliation and had previously served as the parliamentary secretary for Forest Lands and Natural Resources Operations. His views are in keeping with prevailing attitudes in FLNRO and the forest industry. Falcon’s attempt to modernize his party by officially recognizing that climate change is a scientific reality that must be addressed, does not mean that it is sufficiently important to question the economic and ethical framework that drives climate change. It certainly does not entail a commitment to the Old-Growth Strategy and to the protection of biodiversity. It is change, but not really transformation.

That is part of what is disturbing in the media’s reaction to President Biden’s passage of the first major piece of climate legislation ever enacted by the United States, the *Inflation Reduction Act*, (henceforth IRA). It is really more of the same on two essential fronts. It is more economic status quo and it is a deft attack on ocean protection, on which so much biodiversity and actual climate change action really depends.

Ironically, as the name suggests, the IRA was passed not for its focus on climate change, but for the apparent economic relief it brings. While the media has touted it as a massive spending bill, economists looking at the fine print note that it is really only \$1 trillion spread out over the next decade, which amounts to only “one third of one percent of GDP. Massive it isn’t.”¹⁵ It is a nudge in the right direction that comes at a time when we are looking at a moment when world leaders seem resistant to the bilateral cooperation needed to make transformational change. Critics find that it caters too much to the fossil fuel industry and locks the American economy into continued dependency on the fossil fuel industry, while at the same time initiating a shift towards alternative energy in line with the global electric car industry. It is a bill praised by the CEOs of Exxon Mobil and Shell, and as critics have noted, it rewards the oil industry for a five decade-long disinformation campaign.¹⁶

The merit of the IRA is that thirty wasted years after initially signing onto the United Nations Framework Convention on Climate Change, the United States Senate has just passed by a narrow 50 plus one margin its first piece of climate legislation. In fact, just as the technological marvel that is the Webb telescope was deployed in space to reveal stunning images that should answer questions on the origin of the universe, life, and human civilization, one of the most striking scientific revelations this summer may have been a one page memo from the president of the US “Office of Science and Technology Policy” dated 7 July 1977.¹⁷ As per its title: “Release of CO₂ and the Possibility of a Catastrophic Climate Change,” this memo by the well-known geophysicist Frank Press, summarizes the state of knowledge concerning threats posed by fossil fuels in 1977. As he states: “This is not a new issue.” He accurately points out that if steps are not taken to shift the energy economy away from fossil fuels,

CO₂ “may grow to 1.5 to 2.0 times that level in the coming 60 years.” All quite on target with current modeling and climate data of 2022. And so, back on this planet that we sometimes call “home,” forty-five years on as we gaze out in space to the ends of the universe, we remain largely unaware of the wilful amnesia that has brought climate change to what many scientists consider to be an irreversible point. Five decades on we collectively pretend that the foreseeable was unforeseen, that we can continue business as usual, and that, somehow, we will be able to adapt.

After over a decade of obvious climate deregulation, and two summers of global climate extremes that have made climate change undeniable, the new trend in climate dismissal is to minimize the level of risk and suggest that the impacts will be manageable. As scientists like Katharine Hayhoe have pointed out, this is a one-way experiment in climate without replicates or controls. The extreme droughts, fires, heat waves, and floods that we are now witnessing around 1°C global increase are nothing compared to what we will be experiencing at 2°C to 3°C in coming decades. Contrary to what government and industry are selling the public, the general assessment of the scientific community is that we have moved to a point beyond which adaptation is possible. A substantial part of the Biden plan hinges on carbon sequestration technology, which as recent reports indicate does not seem to have worked where it has been tested.¹⁸

Where the matter becomes more serious lies in what this means for the oceans. We are an ocean planet. The oceans control our temperatures and climate. Life came from the oceans and what happens to the oceans sets the course of life on this planet. It is already common knowledge that a shift to electric vehicles requires mining rare earth metals, which right now are controlled largely by and found in China.¹⁹ For the United States, the best source of these minerals lies between the West Coast and Hawaii. Canadian mining interests are already engaged in deep sea mining developments.²⁰ The IRA is not seen so much as an opportunity to change our mental paradigms. It is mainly understood as a renewed economic opportunity to further pillage the planet.

Given the actual corporate and financial interests driving the “green” energy revolution promoted by the IRA, it should, therefore, come as no surprise that after three decades of meetings, governments were unable, or unwilling, to ratify a treaty to regulate deep sea mining and protect oceans at the 27th annual meeting of the International Seabed Authority at the recent UN Ocean Conference in July.²¹ As a sequel, more recent talks in New York have also failed to produce a treaty to protect marine biodiversity in areas of the ocean that are beyond national jurisdiction. The leading powers, the United States, China, Europe, and Russia refused to cooperate on “a legally binding agreement to conserve and protect marine biodiversity on the high seas, despite urgent pleas to protect one of the last wild places on the planet from the pressures of climate change, overfishing, shipping and resource harvesting.”²² Given the current global rejection of multilateralism, it is unlikely that international cooperation on biodiversity and climate change will be agreed to in December any more than it was in August or in July.

Realistically, after three decades of discussions, countries that cannot cooperate on what should be a matter of existential interest are unlikely to be any more cooperative with regards to

biodiversity and climate change. There is no political awareness of, nor interest, in the fragility of the planet outside of some scientific circles. So talk of “precautionary principles” or “climate justice” without an actual change in the demands we place on the planet are simply vacuous. Narrow economic interest just overrides commonsense.

The Frank Press memo not only re-confirms, as I have argued at length elsewhere, that contrary to the official and commonly accepted version of facts, concern over climate change did not begin with Dr. James Hansen’s 1988 testimony to the United States Senate Committee on Energy and Natural Resources. As stated in the Frank Press memo, the facts and the concerns surrounding climate change were well-known to members of the National Academy of Sciences, and anyone who cared to be informed, 12 years prior to Hansen’s testimony in Congress. We have really known for a long time both the problem and its solution. From a historian’s point of view, back in 1965 Lovelock and Margulis were simply in tune with a growing realization that mainstream thinking was already out-of-step with our existential reality. The paradigm of urban ethics needed to change then.

It, therefore, is not too surprising to find that, as the situation deteriorates, calls for an end to prevarication are growing shriller.²³ In BC, as in most of the West Coast, it is clear from the uneven and unpredictable salmon returns, the overheating rivers, and the deteriorating forests that here, as everywhere, we have overexploited this planet at great cost to future generations, and we now need to change to survive. The question is whether we can really prioritize our place in Gaia over our economic convenience and the comforts of short-term thinking. It is not just a case of accepting science, but of understanding the changes it has been calling for over five decades.

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Strathcona Wilderness Institute, the Friends of Strathcona's Far-sighted Answer to BC Parks' Anti-environmental Policies, and a Model for Community Science

- in memoriam Ron Hatch (1939-2021)

Thirty-four years after the “Friends of Strathcona’s” 1988-1989 protest against the expansion of the Cream Silver Mine in Strathcona Park, which would have obliterated Cream Lake and most of the Thelwood Creek and Price Creek watersheds, few visitors to Strathcona Park, and even fewer British Columbians, are aware that were it not for that historically important protest, BC’s oldest and largest park would now be a maze of clearcuts and mining claims. It is not surprising that, for the past three decades, BC Parks and the Ministry of the Environment and Climate Change have done little to commemorate this historic protest, which saw both BC Parks and the ministry duly indicted in Dr. Peter Larkin’s landmark report *Restoring the Balance*.

The facts listed by Larkin paint BC Parks as a compliant arm of the Ministries of Forests and Mines, all-too-willing to trade parts of the park for forestry and mining permits, all for money and window-dressing. Leopards never lose their spots. This problem remains systemic and attitudinal in the hierarchy of BC Parks.

The attitude of British Columbians towards the “environmentalists,” whom the premier vituperates and Justice Elizabeth Church criminalizes, might differ if they were aware that under Liberals and NDP, BC Parks has a dubious history of protecting the interests of commerce over wilderness. As Larkin’s report showed, BC Parks is not a conservation agency. It merely implements recreational policies of the government of the day to distract the public from the depredations of the mining and forestry industries.

There should be at least a cairn to commemorate the 1988 protest. The protest was the formative ground for Clayoquot Sound. As

such, the environmentalists, not BC Parks, saved Strathcona Park. They were ultimately responsible for the restoration of some of the park’s integrity and all the additions in the 1990s to the park including the Clayoquot Biosphere reserve.

To date, only about 40% of Larkin’s recommendations are implemented. The buffers around the park that he recommended, including Jessie Lake, Pearl Lake, Forbush Lake and Willemar Lake, were excluded and now stand in continuous clearcuts that border the park. Access to the edges of the park and proposed public campsites that were promised in 1993 remain in control of the forest companies.

The park is back under threats that started when the government gave away exclusive rights to park usage to the Clayoquot Wilderness Lodge,¹ a dude ranch that charges between \$1950 and \$2,750 per adult per night.² Since Friends of Strathcona lost that case, commercialization has been increasing over the past five years. Bill 4, passed in 2014 to allow transmission lines and pipelines through the park, was never repealed by the NDP, which has only furthered the Liberals’ pro-commerce and industry stance.³ Commercialization that Larkin excoriated has now been subtly re-introduced by BC Parks, with little response from the environmental community.

Concerns about commercial tourism that began in 2008 with the Clayoquot Wilderness Lodge now find private property at Moat Lake, which was supposed to be only for grandfathered family use, helicoptering in clients to the Moat Lake Retreat.⁴ The private park operator, which replaced park staff for trail and campsite maintenance, has now been given a permit to run a business in the park renting canoes and kayaks on Buttle Lake – conservation impacts on sensitive declining shorebird populations be damned. In 2021, unknown to the public, the mine’s new owner “Myra Falls Mines,” was given an expansion permit. Perhaps it is small potatoes, but it is the thin edge of a very disturbing wedge contrary to Larkin’s recommendations and excluding public interests in wilderness.

BC Parks has been further commercializing the park by adopting booking systems that require that all campsites be reserved in advance. As research on reservation systems in the U.S. National Parks shows, these systems discriminate against lower income demographics, and favour urban white campers with higher than median household incomes.⁵ The establishment of “group campsites” is an extension of this discriminatory practice. Group campsites are exclusively available by reservation and exclude non-group campers. As at Croteau Lake, they follow a “Club Med” model with a “host”, with a luxury “tent”, a communal yurt, and kitchen facilities. The unintended environmental impact of this is that single campers who arrive too late to reach the next campsite inevitably pitch tent in sensitive ecological areas to the detriment of local flora and fauna.

While BC Parks has been erecting expensive signs re-assuring the public that it is “inclusive,” its policies and actions are decidedly “exclusive.” Nowhere is this truer than when it comes to doing scientific research. BC Parks’ notorious reputation for obstructing research permits is even more explicit in the overtly discriminatory eligibility criteria for its flagship: “Living lab for Climate Change and Conservation Program.” Eligibility is limited and exclusive: “*Lead applicants must be professors who*

hold a current teaching or research position with a public post-secondary institution in BC. Adjunct professors are not eligible for Living lab funding.”⁶

This raises a number of red flags. First, it is a clear case of “ageism.” Retired professors, no matter how well-qualified, are excluded. It also excludes some of the leading climate researchers in BC such as Dr. Richard Hebda (retired adjunct professor). Second, BC has a large pool of environmentalists who are adjunct professors and professionals. Are they excluded for being adjuncts or environmentalists? The eligibility criterion favours age and privilege over merit.

Third, this policy runs completely against the recommendations of the *Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*, which stress the urgent need to move away from exclusionary top-down approaches (such as BC Parks’) and engage local communities if humanity is ever to stand a chance to address climate change.⁷ That is a far cry from BC Parks’ belief that parachuting university professors in the summertime into local communities will somehow solve climate change. That approach simply perpetuates the socially discriminatory notion that science is something that is done only at universities in urban environments. That is socially divisive and only serves to feed climate denialism. To solve the climate and biodiversity crises, we need to connect people with science at a local level focused on including local resources and knowledge. That begins by recognizing the work of scientists working away from universities in rural localities.

The Friends of Strathcona understood early on that there is a need not only to reactively protest politically and advocate legally for the park, but also to pro-actively provide nature education and inventory Strathcona Provincial Park’s species. That became even more urgent when in 2001 Gordon Campbell closed the remnants of BC Parks’ naturalist programs. In 1995, Betty Brooks and Steven Smith led the drive to set up the Strathcona Wilderness Institute (SWI) to liaise with BC Parks and provide park information, education, and research.

Since 2018, SWI has launched six non-invasive and unpermitted research projects, without any financial support other than federal Canada Summer Jobs to pay one to two students yearly. These projects listed by starting year are as follows:

1. Fungi of Strathcona Park (2018),
2. Bryophytes of Strathcona Park (2019)
3. SWI Data Collection Site (2020)
4. Student Research Transects (2020)
5. Lichens of Strathcona Park (2020)
6. Strathcona Park Climate Change Lakes Project (2021)

The data for these projects is compiled in the publicly available iNaturalist site “SWI Data Collection”. BC Parks incorporates this information at a cost of hundreds of thousands of taxpayers’ dollars in the BC Parks project run by Dr. Brian Starzomski (UVic) and Dr. John Reynolds (SFU). As Dr. Starzomski has publicly stated, the work of SWI has made Strathcona Provincial Park “the best inventoried park in BC, heads and shoulders over all other parks.”⁸

Indeed SWI has documented over 2,000 species in the park. It has quadrupled the number of known species of mosses, liverworts, lichens, and freshwater algae in the park, and increased known numbers of floral and faunal species recorded on Vancouver Island. It has increased the number of rare and red-listed species, and even discovered one mushroom, one or two new lichens, and one moss new to science, as well as extremely rare species new to the Americas.

What matters here is not that SWI is unsupported by BC Parks, that work goes on regardless, but that this local volunteer citizen science vindicates and consolidates the political achievements of the environmental community. While BC Parks gave an expansion permit to Myra Falls Mine, SWI discovered a hitherto unknown population of *Pseudocypbellaria rainierensis* (Oldgrowth Speckelbelly) at the mine site. That alone vindicates the 64 arrests of 1988-89. Who in their right mind allows a mine to operate in old-growth, and worse, gives an expansion permit at a time when the United Nations calls for the preservation of biodiversity, because as Antonio Guterres eloquently put it: “*The future of humanity depends on it*”?

Then, there was the discovery of an extremely rare algae, *Cosmarium woronichinii*, a new species to America, on the same road that would have been built to destroy Cream Lake. It would never have been found had the road been built. So why might one care? That discovery tells a story that British Columbians are unaware of. *The Forest and Ranges Practices Act* does not require that forestry operations determine what species might be at risk from logging operations. We have no idea of what species, or how many species, we daily eradicate, and may have lost in BC since colonization started the pillage we call prosperity.

BC Parks discourages locally-based community research in the parks at a time when it is needed most. Every park needs a locally-based institute to raise the bar, collect public data, and communicate with local communities. That might disturb the government’s cozy relationship with business. If SWI found four species new to science in mid elevation old-growth of moderate productivity, and quadrupled the numbers of known species across various phyla locally, that is not just an acknowledgement of the huge knowledge gaps underlying our ecological and economic assumptions. It raises the spectre of the loss of thousands of species across BC on which we are told, the future of humanity depends, and it underlines the need to expand the parks and access to them.

When BC Parks promotes discriminatory policies that exclude local community-based research, it cannot claim to be inclusive. Its policies further the same short-sightedness that sustained the colonial interests of forestry, mining, and commerce before the Larkin report. A hierarchical shake-up may be needed to save our parks, again, and increase BC’s conservation lands to 50% as recommended by conservation scientists.

Loys Maingon PhD (retired biologist)

(July 30 2022)

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- 8 <https://comoxvalleynaturalist.bc.ca/learn-about-the-bc-parks-inaturalist-project/>

ALBERTA News

Submitted by Brian Free, CSEB Alberta Regional Director

By the time this Bulletin goes out, a new Alberta Premier will have been chosen. Premier Jason Kenney had lost the support of his caucus and seven candidates are running to replace him. The federal regulation of environmental management is a sore point with the candidates seeking to be Premier and they all have some form of anti-Ottawa position determined to elevate Alberta's right to manage its own affairs. There is not a lot written about their positions on environmental issues, apart from a disagreement with the federal approach to climate change and regulation of the oil and gas industry. Dare I mention the carbon tax?

Nevertheless, there will be a general provincial election following next spring, so the new Premier will have to sell their party's environmental policies to the general population. Alberta CSEB members should monitor Alberta politics over the next few months and keep themselves informed about the environmental issues at stake.

Northern Crayfish Expands its Range

Recently, a Northern crayfish (*Orconectes virilis*) was collected from a stream flowing into Bow Lake in Banff National Park. It's the first time they've seen this species so far upstream in the Bow River watershed or in a mountain national park.



The northern crayfish is considered an aquatic invasive species and were originally limited to the Beaver River watershed in

east-central Alberta. The Beaver River drains into the Churchill River, which discharges to Hudson's Bay. These crayfish are now widely distributed throughout the province. It is the only crayfish species known to be established in Alberta at this point, but others are located in adjacent provinces.

10-year Review of the Lower Athabasca Regional Plan (LARP)

For those interested in land use planning in Alberta, the Alberta *Land Stewardship Act* established seven land-use regions across the province. These form the basis for land-use plans that set regional objectives and many conditions that must be followed by municipal plans and managers of public lands. Two regional plans are currently in place – the Lower Athabasca Regional Plan (LARP) was established in 2012 and the South Saskatchewan Regional Plan was established in 2014.

The Act requires that all regional plans be reviewed every 10 years, and this is the first such review. The Lower Athabasca Regional Plan covers a large area in northeast Alberta, including the oil sands mining operations. The plan includes management frameworks with limits and triggers related to surface water quality, groundwater quality, and air quality in the region that guide many of the decisions around industrial emissions. Public engagement for this review is expected to begin in September.

For CSEB members interested in this part of the province or regional planning in general, check out the LARP review at <https://www.alberta.ca/release.cfm?xID=844668D832A73-9423-767A-74FF7D01FD485F83>.

A National Park and Oil Sands Tailings Ponds

Investigators from UNESCO have travelled to Alberta to consider threats to Wood Buffalo National Park, a treasured World Heritage Site. The investigators are assessing whether federal and provincial management of the park are maintaining its integrity or should the UN agency place the park on its list of "World Heritage Sites In Danger".

A key consideration are the oil sands tailings ponds adjacent to the Athabasca River that flows into the park and the vast Peace-Athabasca freshwater delta. The ponds currently hold about 1.4 trillion litres of contaminated water and continue to grow. First Nations and environmental groups worry that the Alberta and federal governments have already decided that treating and releasing the water into the Athabasca River is the best solution for tailings pond reclamation. Other solutions on the table include recycling the tailings water back into operations or injecting it underground.

A pilot full-scale treatment facility began operation in June 2019 to determine the feasibility of treatment and release into the Athabasca River. For more information about this treatment process, see <https://www.canadianenergycentre.ca/large-scale-pilot-to-treat-oil-sands-process-water-set-to-resume/>

SASKATCHEWAN News

Submitted by Curt Schroeder, CSEB President and Saskatchewan Member

Researchers Discover Unusual Scale Patterns on Fossil Found In Saskatchewan

New analysis of a piece of fossilized dinosaur skin found in Saskatchewan has researchers wondering if there could be more to the story for Skinny the Edmontosaurus. A section of fossilized skin recently examined by Dr. Ryan McKellar, curator of paleontology at the Royal Saskatchewan Museum, and University of Regina graduate student Caelan Libke has revealed an unusual scale pattern unlike other samples found in North America, and it's raising questions.

"The scales on Skinny have these really fine ridges that haven't been seen in any other Edmontosaurus specimen before," said Libke.

Skinny is a subspecies of hadrosaur, colloquially described as duck-billed dinosaurs, who was uncovered from the same area northwest of Eastend, Sask. where Saskatchewan's famous Scotty the T.rex was found in the early 1990s.

Both dinosaurs are from the late Cretaceous period, said McKellar, making Skinny one of few hadrosaur specimens



from this period found outside the northern United States. Libke said skin impressions from duck-billed dinosaurs are often well-preserved with plenty of samples to compare, although few from as far north as Saskatchewan. Those that are from this area, or nearby in Alberta, are often from a different time period, leaving both a periodical and regional gap between Skinny and other remains.

"The subspecies we're looking at — Edmontosaurus — we pretty much know what the scales should look like across the body," said Libke. "The specimen we're studying has scales that are similar but just slightly different."

This newly discovered scale variation proves wider variation within the species than paleontologists previously thought, but also prompts questions of why and what that may mean in the broader sense of understanding the dinosaurs that lived on the prairies before they were the prairies.

Source: Regina Leader-Post, June, 2022

MANITOBA News

Submitted by Robert Stedwill, CSEB Vice President

Injection of Funds into Chronic Wasting Disease (CWD) Program

First detected in Manitoba in 2021, CWD has been confirmed in five mule deer along the Manitoba-Saskatchewan border. If the disease spreads and becomes endemic to Manitoba, there is a serious risk that CWD will threaten the health of all cervid populations in Manitoba.

To assist in monitoring for CWD, the province has expanded the harvested cervid mandatory biological sample submission zone. All licensed hunters in the expanded mandatory sample submission area will be required to provide head and upper neck samples of harvested white-tailed deer, mule deer, and elk for CWD testing. These samples, which can be submitted with the antlers removed, will allow the province to identify infected animals and determine any spread of the disease within the province.

The \$350,000 investment will enhance sampling efforts by establishing additional sample drop-off locations and reducing turnaround times for testing of samples submitted by hunters."

One can only hope that the voluntary submission of samples will be honoured by hunters to ensure that the provincial government has good data from which to develop management plans to curtail the spread of CWD. This is not unlike the voluntary zebra mussel (*Dreissena polymorpha*) boat inspection program where boats were examined for the presence of mussels or veligers in an effort to stop the transfer of these organisms between different bodies of water.

Of concern now is the presence of veligers in Lake Manitoba, first detected at "The Narrows" last year (2021), likely introduced by a contaminated boat.

When to Establish Environmental Advisory Committees

Recently the Manitoba government established an advisory committee for the Lake Manitoba and Lake St. Martin outlet channel project, to the tune of \$3.1 million.

The immediate answer as to when to establish an advisory committee for any project that has the potential to impact the environment should be at the outset. Based on what is being proposed, committee members should be proponent members, impacted communities (including interest groups), and specialists who can advise on potential impacts and possible amelioration alternatives.

As a former environmental project manager, some of the initial work was to identify the "players" in any given project, and ascertain their role, or roles if an advisory committee was convened. A delicate undertaking to say the least, deciding relative importance of interested parties. Suffice to say, importance matters to everyone!

This particular project caught my attention, as the plans for the channels project were first put forward in 2011 (11 years ago), but the advisory committee was only established this year. Fortunately, reading further, this injection of funds for an advisory committee will formally recognize and continue the engagement with Indigenous groups and other communities that may be affected by the project as planning and implementation work on the project continues to its completion and operation.

Open dialogue and transparency from the outset has been, in my experience, to be the best approach in dealing with environmental issues associated with any given project.

Hopefully, the late establishment of this particular advisory body will not have had a negative impact on the overall project cost, or relationships with interested parties.

ATLANTIC News

By Peter Wells, CSEB Atlantic Member

This section covers some of the recent environmental, living resource and ecological (habitat, species) news for Nova Scotia, as reported regularly in Halifax's newspaper, the Chronicle Herald. This coverage is admittedly quite narrow but as in previous columns in this Bulletin, it gives a sense of the environmental and conservation issues occurring in this Province. However, what we also need is broader coverage for Nova Scotia (i.e. input from other CSEB members!) and equivalent coverage

for the other Atlantic Provinces, e.g. Newfoundland, where there have been extensive inland forest fires this summer.

That said, for Nova Scotia, forest (mis)management and ecology remain one of the mainstream environmental issues. Positive action to protect the forests, both on private and crown lands, is very slowly taking place, with the new *Silvicultural Guides for the Ecological Matrix* (SGEMs) being implemented for most harvests, land-scape planning being contemplated, and the *Crown Lands Act* being reviewed and 20% of crown land being planned for protection by 2030 (Guderley 2022). This is all too slow and some lakes are threatened by harvesting methods. The government is clearly bowing to the forestry lobby, according to Lee (2022), with "the industrial forestry sector rapidly replacing older Acadian-Wabanaki forest ecosystems with the monoculture softwood plantations it favours". Bob Bancroft, a well-known local biologist (we should recruit him for the CSEB!), remains highly critical of the forestry practices due to concerns about migratory birds and the impact of forestry on bird habitats during nesting season. Clearly, the focus continues to be on fiber, not protection (Smith 2022)! More public pressure and activism are needed to move forest protection along faster!

One good news story has emerged from the forestry scene recently, with one small stand of old forest in Annapolis County being protected due to the presence of three endangered species of lichens (Campbell 2022a) and the dedication of an activist group to protect their habitat. This is a small but significant win in an otherwise sad story of decades of provincial land mismanagement.

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Open-net fish (salmon) farms continue to be developed along Nova Scotia's coasts, despite community objections, the overwhelming evidence about impacts on marine ecosystem health, and the recent BC decision to transition away from such aquaculture practices (Watson Smith 2022). As with the forestry industry, the provincial government is compromised, in this case supporting the industry (Cooke Aquaculture) and at times approving new developments without public consultation. The opposition of communities (fishers and coastal residents) to open farms in coastal bays continues, largely without success.

Mining continues in the province, with coal extracted for its coal burning power plants; one mine has been idled due to "adverse geological conditions" and may close (Jala 2022a). Gold mining is being contemplated along the eastern shore, with concerns about habitat loss and downstream water quality (metal contaminants).

Water quality was recently affected by a 600,000 litre gasoline spill into Sydney Harbour from a petroleum storage and distribution facility (Jala 2022b); it was monitored but no other information is openly available.

As was the case last year, some NS lakes this summer have been contaminated by toxic blue-green algae (cyanobacteria), the situation accentuated by the hot and dry weather (Taplin 2022); health advisories have been posted to prevent people and pets from being affected upon contact with the water.

Fisheries continue to be in the news, given the huge regional importance of this industry. A First Nations moderate livelihood fishery for lobsters has been approved, within established commercial seasons, after much discussion and controversy (Jala 2022c); a request has been made to change the federal *Fisheries Act* in this regard. Concerns continue about the fate of the herring fishery in the Bay of Fundy (Beswick 2022a), due to a current but not unprecedented massive decline in its overall biomass and uncertainty about the cause(s). According to a local researcher Dan Boyce at the Bedford Institute of Oceanography, there is a need "for a management scheme that considers the entire ecosystem and the impacts of climate change" (Beswick 2022a); many variables are at play, from water temperatures to the presence or absence of critical zooplankton (a food source for herring). The big question — should the herring fishery stay open when numbers of fish are extremely low?

Happily, there are a number of good news stories in NS regarding habitat and species protection pertaining to parks, biosphere reserves, and conservation areas.

The Owls Head park controversy/scandal, reported in earlier columns of the CSEB Bulletin, has been resolved after much public involvement, with the unique coastal area of barrens, wetlands, and unique bedrock-ridged topography on the Eastern Shore of NS now formally promised by the provincial government to be a provincial natural park reserve (Campbell 2022b; Peddle 2022). However, this has pointed out that the NS government needs to be held accountable for its promises to protect crown land, establish more provincial parks, and never again delist them illicitly. It is encouraging to see a few environmental and conservation groups active in the quest to protect and enhance the treasured provincial park network.

A number of UNESCO Biosphere Reserves are present in the Atlantic region (19 for Canada as a whole), one of which is the Bras d'Or Lake Biosphere on Cape Breton Island. This Reserve has just received major funding to support hydrological monitoring associated with wetlands in the lake's watershed (Saltwire Network 2022), an important source of freshwater for local indigenous communities.

The Nature Conservancy of Canada (NCC) in the region continues its good work with the purchase of a large property to protect wetland and flood plains along the adjacent Musquodoboit River, on the eastern shore of NS. These are important habitats for the common snapping turtle and the bank swallow, both being species at risk (Campbell 2022c). The NCC continues such work in NS, connecting various lands into wilderness corridors for wildlife. The group is accelerating the pace of such work and deserves our support.

Species protection continues in NS, focussed on fish and mammals. After the closure of the tidal power generating station at Annapolis Royal in 2019, much work has been conducted to find, catch, and tag the Atlantic Sturgeon in the Annapolis River, a much-threatened species and one greatly affected by the power dam turbines over several decades (Beswick 2022b). The research, monitoring, and tagging has been a joint effort of the Clean Annapolis River Project and Acadia University; information is fed into COSEWICs program on endangered wildlife. Finally, the NCC has bought land in southwest NS that is critical habitat for the endangered mainland moose (ABD 2022). The newly protected area is called the Moose Lake Nature Reserve and is close to the much larger Tobetic Wilderness Area, all vital moose habitat.

To conclude, it is encouraging to note the success stories and the role of community groups and the larger public in efforts to protect the region's natural habitats and threatened species. Governments are being held accountable and their responsible departments increasingly listen to, cooperate with, and help fund community led projects. The role (vigilance, expertise, and dedication) of CSEB environmental biologists in various sectors is vital to living in and with our natural world.

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TERRITORIES News

Submitted by Anne Wilson, CSEB Territories Director

I hope this finds everyone enjoying the start of autumn, with the cooler temperatures and changing leaves! It has been too long since I had the opportunity to travel in Canada's North, and I'm looking forward to visiting the NWT this fall. In July, I traveled to southern Greenland, and was struck by the similarities there to Canada's eastern Arctic — not just the tundra, but the language and housing reminded me of Nunavut communities. And temperatures of 5-8 °C were definitely right in my happy place!

News Bits:

NWT Barren-ground Caribou Population Survey:

Results are available for five herds assessed in the 2021 survey, which was a collaborative effort with community observers and co-management partners. Many herds are still declining.

The 2021 Population Survey Results are as follows:

- Bathurst: 6,240 (down from 8,200 in 2018)
- Bluenose-East: 23,200 (up from 19,300 in 2018)
- Bluenose-West: 18,440 (down from 21,000 in 2018)
- Cape Bathurst: 4,913 (up from 4,500 in 2018)
- Tuktoyaktuk Peninsula: 3073 (up from 1,500 in 2018)

The Territorial government continues to use satellite collar tracking to track movements throughout the year, studying seasonal range distributions and migration routes.

NWT Cumulative Effects Monitoring Program:

The Northwest Territories Cumulative Impact Monitoring Program (NWT CIMP) is providing \$1.7 million in 2022-23 to support 29 monitoring and research projects. Funding recipients include Indigenous governments, Indigenous organizations, universities, and territorial and federal government departments.

This year, approximately \$1.2 million is being provided for ongoing projects and approximately \$500,000 is being provided for eight new projects. Of the 29 projects funded, 5 are focused on Indigenous Knowledge, 22 are science focused, and 2 combine Indigenous Knowledge and science. All of these projects address key cumulative impact monitoring priorities for caribou, water and fish.

2022 Fire Season:

Hot, dry conditions in the late summer have heightened the fire danger. More than 500,000 ha burned this season, with one fifth of that area in the last week of August. By mid-September, there were 111 active fires and a total of 244 fires this year. Fire activity was distributed throughout the area below the treeline, with the greatest numbers in the North Slave and Sahtu regions.

Temperature Records Falling:

Between June 1 and August 22, 2022, the heat wave that hit the North this summer broke 166 daily temperature records in Nunavut, the Yukon, and the NWT. Records weren't just reached, they were smashed, with new records being 5-6 °C higher.

Urban Bears and Bison:

Yellowknife has had an unusually high number of bears moving into or through the city this fall. Sadly, several have had to be euthanized (one while breaking into a condo). Meanwhile, just south of the NWT border, Fort Nelson is unhappy with the migration of bison into the area — describing them as invasive, unfriendly, and destructive! Cattle guards are proposed for installation on a Highway 77 bridge, such as those used to prevent bison migration across the Mackenzie River's Deh Cho Bridge.



Arctic solidarity:

Canada's three territorial premiers reinforced their solidarity at the Arctic Circle Greenland Forum which drew leaders from across the circumpolar world and beyond to Nuuk, Aug. 27 to Aug. 29. Hundreds attended the Arctic Circle Greenland forum held in the Katuaq conference centre in downtown Nuuk. Arctic Circle aims to improve dialogue among political and business leaders, environmental experts, scientists, Indigenous representatives, and other international stakeholders.

Notes on NWT and NU Development and Activities:

Development activity and projects in the North are a bit quieter currently, and include the following:

- A proposed wind farm project in Nunavut.
- Technical review of the proposed expansion of mining at the Meliadine Gold Mine. This includes extending the underground ore mining, the addition of a windfarm for power supplementation, the option of building a full-sized airstrip, and potentially disposing of mine wastes in exhausted open pits.
- Exploration for diamond and metals continues across the NWT and NU.
- Three diamond mine sites are further developing closure plans, with the anticipated end of mining at three of the four diamond mines in the NWT in several years. One of the mines is looking at remote underwater mining of pits, which may extend the mine life.
- The Chidliak Diamond project in NU is expected to submit their development applications shortly.
- Remediation projects continue at the Giant and Rayrock mine sites.

Closing:

If you are connected to activities in the Yukon, Northwest Territories, or Nunavut, doing work north of 60° that you would like to highlight in the newsletter, or running some seminars or other training opportunities, please let us know. The CSEB provides a valuable networking and communication forum, and a voice for biologists on any issues to be raised. There is also the option of instigating other CSEB activities — both of the fun and/or of the educational variety — with colleagues in the North. Please email your thoughts to Anne Wilson at anne.wilson@ec.gc.ca. There is also an opening for another Territories Director — please contact Curt Schroeder or myself if you would like to take on this role!

2022 Canadian Ecotoxicity Workshop (CEW)

CEW will take place in Winnipeg, MB, October 2-5, 2022.

For information, see <http://ecotoxcan.ca/>

Check out the CSEB Video at

<http://youtu.be/J7cOuDbBf9c> or
<https://www.youtube.com/watch?v=J7cOuDbBf9c>

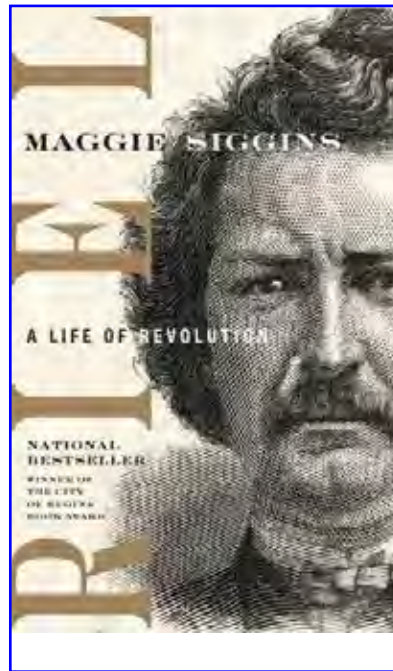
BOOK Review

Submitted by Bob Gainer, CSEB Alberta Member

RIEL: A Life of Revolution

by Maggie Siggins 1994 HarperCollins Toronto, Canada.

Available from [Amazon.ca](https://www.amazon.ca/): \$11.99 (Kindle), \$17.14 (Paperback) CAD



“Arguably Riel has received more organizational and academic scrutiny than any other figure in Canadian History” according to Wikipedia (August 11, 2022). In 2004 the CBC series “The Greatest Canadian” ranked him lucky #13. One of the requirements of sainthood is that the person becomes greater after death than before. Maybe it is time for his nomination? This is the second book review by me for CSEB on Riel. “Not another” snarled my wife. I have probably read at least a dozen books that are about him or in which he is featured.

Maggie Siggins was the Governor General’s award-winning author of a previous historical review and was chosen to research an enormous collection of Riel’s diaries, personal letters, poems, professional letters, letters to editors, other people’s letters to him, and any and every scrap of information on him. Luckily she could hire a professional researcher that helped organize it for her and the result is 507 pages.

“Historians have debated the Riel case so often and passionately... that interpretations have varied considerably, especially over time” (Wikipedia August 11, 2022). My opinion of Ms. Siggins’ point of view is that she has a liberal arts background, especially as a historian, makes remarks about Riel’s extraordinary good looks many times, makes abundant use of his poems throughout the book, especially the more romantic ones, makes abundant use of descriptive words especially regarding judgmental issues, overall has a favourable impression of him, has as a theme that he is Canada’s Che Guevara of French, catholic, and native people, and avoids mentioning he was actually a traitor to the Federal Government.

I did learn that the original Riel was from Ireland (I assumed France, but they say the Catholic Irish are a big part of Quebec’s “pure laine”). My father’s grandfather, who moved to the Red River settlement in 1865, was a Protestant Irish (an Orangeman) from Ontario, (as were my mother’s family who moved out

west in 1905), the hated enemy. The Red River Settlement's river systems were made use of long before the Northwest Fur Company started using them to access Montreal in the 1770s (the La Verendryes, etc. started a century before), but the Northwest Fur Company had by far the biggest impact. Owned by Highland Scots, managed primarily by Orcadian Scots, the manpower, the transportation fuel, were the French speakers and natives from Quebec. For comfort, there were local ladies and, after a few generations, the locals were all a mixed lot.

The Northwest Fur Company's Fort Gibraltar was replaced by the Hudson Bay's Fort Garry after the Bay's reverse takeover in 1820. Natives, Metis, and fur trade workers in general were settled around these Forts. Just before the fur companies amalgamated, Lord Selkirk had brought over refugees from the Highland Clearances to farm the area along with almost an equal number of German, French, Swiss, and Italian mercenaries to defend them from the feuding fur traders. They all needed winter comfort and none had brought any women with them; hence the 99% mixed race children brought up in the area.

After the Hudson Bay's amalgamation with the Northwest Company, the free traders still competed with them. The Bay thought they owned the rights to the fur trade but their route to the Hudson Bay was by using York boats to go north hundreds of kilometres. For several years they tried to ignore the fact that it was far cheaper and easier to use Red River carts to the riverboat system (and railroads springing up) in the United States just a few easy short miles to the south. At first, the free traders were based in Pembina but when it became part of the USA (1815), they moved to White Horse Plains (near Portage la Prairie). They were a mix of English and French speaking native crosses from generations in the area and didn't mind defying the Bay.

About 100 years after the Red River Settlement formed around the Northwest Company and Hudson Bay forts, the first Riel Rebellion (1870) happened. The Settlement within a 50 km radius was a collection of about 10,000 people from a dozen or more different mixed race communities, Catholic and French, English speaking and French speaking, Hudson Bay employees, free traders, farmers, buffalo hunters, Red River cart trippers (to the USA and back primarily), Coeur du bois (canoes to the distant Fort Chipewyan area and beyond), York boaters (to the Hudson Bay and northern Saskatchewan). The single largest group were the White Horse Plains community, composed of Metis (French speaking) and half-breed (non French speaking) mixed bloods who did all of the above forms of labour but who also specialized in their buffalo hunts. Pemmican was the food of the transport workers and all the labour depended upon its availability. Actually, it was the currency of the settlement. All of these mixed-race communities had developed thousands of property rights based on the Quebec river lot system that was now being changed to the British system in anticipation of an onslaught of settlers from Ontario, the result of the sale of Rupert's Land to eastern Canada in 1868. Most of the settlement was threatened by this but a few, those attached to the Hudson Bay and Orangeman land speculators primarily, were actually for this. Into this fiasco Riel was dragged.

At the beginning Riel was just a bystander. The mix of origins and opinions he could handle because he was equally fluent. He

became the unifying force when it was time to develop their basic code and bill of rights because he was essentially the only literate person present representing the property right owners, especially as regards legal and moral issues. The biggest problem became the small but aggressive, better educated Orangeman faction who didn't yet own property and who couldn't get along with the predominant mixed blood community who did own property, but that owned their own English language newspaper. In the end, Riel took charge, the Metis and English supporters who owned property took control of the community, jailing those who stood up to them including closing down the English newspaper and executing a particularly obnoxious Orangeman.

The *Manitoba Act* (1870) that Riel's Provisional Government had drafted was adopted by Parliament unanimously but that didn't stop Sir John A. Macdonald from sending out troops that sent the Provisional Government running for their life. The militia volunteers that arrived had a decidedly Orangeman sympathy, and there was an unofficial fatwah against French, Catholics, and Natives. Mostly the persecuted groups of people got out of Dodge so to speak, many of the White Horse Plains Metis/half-breeds, and other English speaking settlers left and went to the Batoche area, a fair portion of the Metis/half-breeds went to the Pembina area (the USA), and most of the native communities just fled anywhere (like Thomson Highway's family). The Orangeman (including my father's grandfather) and militia ended up owning a lot of what was abandoned (spoils of war).

Riel went south to the Pembina area, which was still close enough to this community so that he was able to get elected three times to represent the French part of the settlement in Parliament. He even signed in once in disguise but then ran for his life. The Orangeman community had an enormous bounty on his head. But what a celebrity he had become. Every letter to the editor he wrote was immediately published and he wrote several a day. The newspapers were getting rich off him even though he was broke. The more he wrote the smarter and more knowledgeable he became about the publicity business until finally, after a few years, he ended up in an Insane Asylum in Quebec for two years.

When he got out, he thought somehow he should be able to make a living in Canada because of his knowledge of politics but it wasn't to be. He was bitter and angry, he went to President Grant at least twice about his support for the USA annexation of the Northwest, he went to the Fenians (the Irish catholic counterpart to the Ontario protestant Irish Orangemen) who had tried to invade eastern Canada several times for American annexation but they weren't interested in the Northwest. Riel drifted west and joined up with Metis buffalo hunters in the Pembina area who drifted further west about the time of Custer's last stand and tried to convince Sitting Bull and any Sioux he could to join the Metis and take over the Northwest but was thwarted, just barely, by the newly formed NWMP. Riel moved further west and spent the winter trying to talk Crowfoot of the Blackfoot and Big Bear of the Cree into his plan of taking over the Northwest but again the NWMP had just beat him to it. During the next three years, he gave up his dream of overthrowing the Canadian Northwest, became an American citizen, got married, had children, and reluctantly settled down as a teacher at a Residential School near Great Falls when Gabriel Dumont came to get him to lead the second Riel Rebellion at Batoche.

Unfortunately for Louis, or fortunately for Canada, Dumont was just a year or two too late. After the first Riel Rebellion in 1870 all the American whiskey peddlers and wolfers based in Fort Benton Montana that were freely roaming Canada's southern Northwest now knew the area was completely undefended and took full advantage of it. Sir John A. got the message, and in 1874, he formed the NWMP and sent them out there to kick out the Americans, to keep an eye on Riel, and prevent him from teaming up with any groups in the area, and to get the local tribes to sign Treaties. About all a Treaty did was to agree they were Canadian and to protect that tribe from the surrounding tribes. The tribes all hated each other and didn't realize it was divide and conquer by the Federal government. Sir John A. also got the railroad started. In 1876, Custer had his last stand and the Sioux were pouring into Canada but no treaty for them.

This was all fine until 1880 when the buffalo were disappearing, fast and the natives were starving. Every year it got worse and Sir John A. didn't seem to care. The agents who got the contracts to feed the natives were patronage arrangements, and by the winter of 1884-85, it was a gigantic abuse of humanity (native). Whereas before there had been a reluctance to join Riel's campaign, now there was strong support to join him but Riel was not available to take advantage of it. When Riel did come back and exactly when he needed native support, Sir John A. used the new formed railroad to flood the reserves with food and presents. Now there was too much food and suddenly they no longer felt like joining Riel. Actually, Ms. Siggins might be right; the NWMP signing treaties and their dealings with Sitting Bull may not have been as important as the bribe of too much food that kept the Canadian tribes from joining Riel. In 1882, the Railroad had got to Regina, in 1884 Dumont got Riel, and in the spring of 1885, the second Riel Rebellion had started.

Once at Batoche, the old Riel magic happened again, he united most of the different factions, and formed a new Provisional Government (the "Exovedate", part of his new religion/government) that produced a reasonable Bill of Rights including the creation of a new Province called Buffalo but the militia was already on the new railroad and it easily put down the second Riel Rebellion. Several innocent non-combatant civilians got killed so Riel and several "bad Indians" got hung and that was the end of the Northwest's hopes for fair treatment from Ottawa.

Before the militia got there, it was exactly as Riel had been saying. The Metis easily defeated Colonels Crozier and Irvine's NWMP at Duck Lake, a Cree band would have wiped out Colonel Otter's NWMP detachment sent to protect the Battlefords but for Poundmaker's intervention and other native groups were in the process of wiping out the fur trading posts along the North Saskatchewan River until Poundmaker and Big Bear stopped that too. Luckily, the NWMP had previously convinced Sitting Bull, Crowfoot, Big Bear, and Poundmaker to resist Riel's temptations and sign government treaties, and the railroad next delivered a month before all the food the natives had been dreaming of for the last five years. Riel's dream of a separate Northwest Nation with native support then quickly ended when the new railroad delivered the well supplied militia from eastern Canada that quickly put down his second Rebellion. As it was, he came really close to realizing his Revolution and that is probably why Sir John A. hung him instead of giving him jail time ("even though

every dog in Quebec howled in protest"). In jail, he still would have been an extremely effective troublemaker.

Ms. Siggins' comparison of Riel to Che Guevara as the "white knight in shining armour coming to the rescue of the abused" is true. The Canadian government never felt the need to deal in good faith, not just with the natives, the French, and the Catholics, but with anybody that lived in the Northwest Nation in general. Alberta and Saskatchewan were not given the Provincial status that Manitoba received in 1870 until 1905, and they did not receive their land and mineral rights until 1930. Until the 1960s, these two Provinces were the poorest in the country. The initial settlement of the farmland was completely misrepresented by the Federal Government, and the subsequent neglect of the human tragedy it caused, especially the dirty 30s under MacKenzie King, was, according to Pierre Berton, Canada's biggest shame. This was followed by the immediate conscription of the prairie unemployed for the British front lines with the outbreak of World War II. "Conscription was necessary, but not necessarily conscription (for those not on the prairies)" sayeth MacKenzie King. The Brits couldn't believe what a good friend MacKenzie King was at the start of their war effort volunteering all these men for slaughter. Once oil was discovered and the Northwest Provinces were no longer Canada's poorest provinces, the Federal Government proceeded to take away their mineral rights.

Because Ms. Siggins denies that Riel actually tried to convince all the tribal leaders in the area to overthrow the Northwest communities, she ignores the fact he was a traitor to Canada. I reread "*Crowfoot: Chief of the Blackfoot*" by Hugh Dempsey and "*Sitting Bull: the Years in Canada*" by Grant MacEwan. Both these authors were much closer to this specific issue and have much more credible interpretations than does Ms. Siggins. She claimed it would be self-serving of the NWMP to claim credit for saving the Northwest, and it would of course. But it may also be true. According to MacEwan (p.205), Sitting Bull admitted to meeting with Riel five times (which Ms. Siggins questions) but Major Walsh of the NWMP and a local trader Jean Louis Legare convinced Sitting Bull not to ally himself with Riel (MacEwan considers Legare to be the biggest Canadian hero). MacEwan was a lot closer to the events than Ms. Siggins. Still, if Riel could have got a message to a friendly Sitting Bull in Northern Montana at the time of Middleton's attack on Batoche, thousands of Sioux warriors might have responded (rather than just the few hundred Canadian Sioux including the Assiniboine; a Canadian branch of Sioux). In addition to Custer's Last Stand, there would have been a Middleton's Last Stand. MacEwan has a "What If" chapter on this topic.

Similarly, Colonel Macleod of the NWMP was instrumental in kicking out the American whiskey traders and wolfers, and in convincing Poundmaker and (to a lesser extent Big Bear) to sign Treaty 6 in 1876 and Crowfoot to sign Treaty 7 in 1877. Custer's last stand was 1876 and by 1877, almost all the Sioux were camped in the Cypress Hills. Sitting Bull was desperately trying to team up with Crowfoot, Big Bear, and Poundmaker to take on the few NWMP and whites in the Northwest. Riel had several meetings with Sitting Bull on the topic. In addition, Riel's Metis group was camped with Big Bear and Crowfoot the winter of 1880-81 near Fort Carrol on the Missouri River 160 km south of Sitting Bull's camp in the Cypress Hills (Dempsey p.124).

Starvation was the main problem. Would not Riel's vision be a topic for discussion for over 100 hungry winter days?

When the Rebellion broke out, it was incredibly easy for the Metis and their few native allies to defeat Colonels Crozier and Irvine's NWMP at Duck Lake. Their group represented approximately half of the NWMP, and they were much savvier about fighting natives on the prairie than Middleton's militia. Most of what was left of the NWMP were under Colonel Otter whose unprovoked attack at Cutknife Hill would have been an Otter's Last Stand except for Poundmaker's intervention. What this demonstrated was how easy it would have been for the Cree and/or Blackfoot to have massacred what settlement there was of the Northwest if the NWMP had not had their leaders sign treaties. Ms. Siggins could only have had blinders on to not to recognize what Riel almost accomplished, the breakup of Canada, but not these two respected authors MacEwan and Dempsey.

Sir John A. ultimately deserves the credit for recognizing the need for the NWMP and the railroad. He also gets credit for not dealing in good faith with the natives, letting them starve to death, which sure made them want to join Riel and throw the Canadian bums out, except for the free trader Jean Louis Legare getting as many supplies for the Sioux as he could and at the last moment Sir John A. bribing them with more food and presents than they had ever seen in their lives (Dempsey p168). It would have been a lot cheaper just to have fed them properly for the last five years than to have sent the NWMP and the Militia to beat them up, unless you just liked the idea of beating these people up.

The reason the Canadian Federal Government still to this day does not feel the need to deal in good faith with the people and governments in the Northwest is because of its Constitution. When the Americans had their revolution and kicked out the British government and their loyalists, they wrote a Constitution that protected the American people and their States from an abusive form of central government. Their Congress, Senate, and Presidential system has checks and balances that does a much better job of protecting the people and the states from politicians. The Canadian Constitution, including Pierre Trudeau's, doesn't do as good a job and in fact it seems to have given the Federal Government more power to be abusive. Rene Levesque figured this out and the result is that Quebec has been able to stand up for itself. Jean Chretien says "Albertans are just a bunch of whiners!" because they don't have a Rene "Riel" Levesque to lead them. At this moment, there is a woman "Riel", Danielle Smith, who is starting to get support. She is suggesting that Alberta should adopt some of Quebec's tactics to prevent Federal Government abuse, a third "Riel" rebellion hopefully without her being a martyr. This last week (Sept 10, 2022) we had a blood bath on a reserve and surrounding area in Saskatchewan in almost the exact same location as Riel's second rebellion. Everyone knows it is a legacy of disingenuous politicians, both government and native, from 150 years ago to today.

In the end, Riel had given up on trying to be a Canadian and turned traitor advocating a separate Northwest Nation primarily to benefit who he thought were being abused — the natives, French, Catholics, and himself. Today, 150 years after Riel, the Northwest is much more multicultural. Danielle Smith's name

is a French English name adopted by the Federal Government because her Ukrainian heritage names were too hard to spell. Ukrainians have contributed as much or more to the development of the central Northwest as the French or English and have mixed their blood just as freely with the natives.

My today's interpretation of the events, being a little obsessed with Louis "David" Riel, Prophet, Infallible Pontif, and Priest King along with his more than a hint of mental instability, and given the 150 years hind sight since his execution and my almost 80 years in the Northwest Nation, I think that he became a desperate man who was right about the Federal Government's lack of necessity to deal in good faith but because a Rene Levesque had not been present to help him solve the problem of dealing with the Federal Government, he resorted to the Che Guevara route. When I was a child growing up in this country, natives were considered human like but not humans and that was why they were put on a type of Game Reserve for the protection of us "regular" humans. Then as a teenager and started working as a farm labourer with them, I realized they were humans. Then as a young adult, I realized they had been treated differently so were a little different, but they still made good friends. In my more than 25 years in the northern part of the prairies, I got to be friends with many fine natives. They shouldn't have been treated the way they were. The Riel Rebellions were because of plain old-fashioned bigotry by the Federal Government. Today, eastern Canada seems to have the attitude that they bought and conquered this area for their ownership of it (and us). We are not fellow nations in the Confederation, we are property that was bought and fought for, and not protected from political abuse.

The first Riel of the 1870 Rebellion was a sincere and genuine member of Canadian society. The second Riel of the 1885 Rebellion was a hurt, mentally damaged, angry, bitter, rejected member of Canadian society who was going to use the knowledge and skills he had learned from the first Rebellion to destroy what he could of the Canada to form his own country with him as its leader. I don't understand Ms.Siggins thinking that he was a "white knight in shining armour" at the conclusion of her book without her also admitting he was trying to break-up her country. Riel had a righteous cause that I agree with, he started two rebellions that I agree with, and was a victim of an unjust form of Government that I agree with. I consider him a saint based on him being greater in death than life. He is my Saint Louis "David" Riel. I doubt you will read much more about him from me. "You said that before!" I hear "she who must be obeyed" shout down the hall. Danielle "Louis Riel" Smith may be a future topic.

More than anything, the disastrous state of native affairs was because Lincoln was in a hurry to settle the American West and Sir John A. was forced to follow suit. Essentially, they tamed the natives and got one Canadian and three American railroads to the Pacific in less than 25 years. After Lincoln started by hanging about 300 Sioux, the Sioux were maniacal about not surrendering to the whites. If Sitting Bull and Riel had managed to make a deal, maybe native treaties would have only been a temporary solution or maybe there may have been more than one Canada (MacEwan, 1973 p. 201-205)

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