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THE ALBERTA WILDERNESS ASSOCIATION JOURNAL

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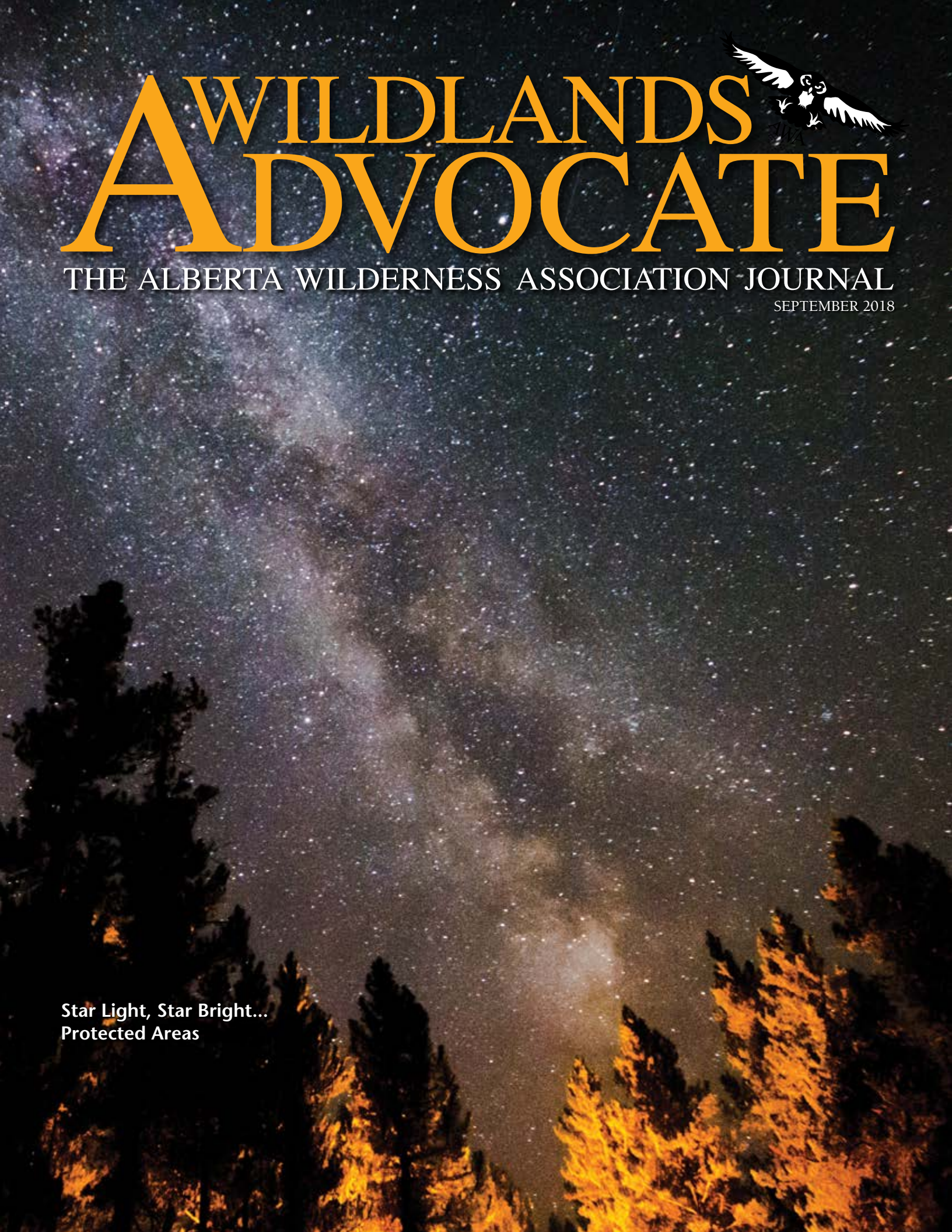

Star Light, Star Bright...
Protected Areas

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Dustin Morasch captured this stunning view of the Milky Way while camping in Kananaskis Country in August. We hope you may have seen such a magical night sky from where you were in Alberta's wild spaces this past summer. PHOTO: © D. MORASCH

Featured Artist: Helen Jull

AWA is very pleased to feature Helen Jull's raku artwork in this issue of the *Advocate*. Helen's first encounter with raku was at an Elderhostel program in Massachusetts (Elderhostel, now called Road Scholar, is a non-profit that offers learning adventures for adults). Helen watched as a face mask was pit fired. When Helen say the fire coming out of the mask's nose and mouth she said "YES!", went on to enjoy the course, and has been creating raku-fired pottery for many years since that introduction. After further training in Alberta and B.C. Helen realized that, for her, the raku process is much more than "just" being spectacular. The creation of raku is primordial – the ancient mix of earth and water, air and fire. Lisa Buck, Helen's artist friend, created the molds for the raku fossils presented later in the magazine. Like Helen, Lisa is pleased to support AWA.

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Protected Areas: The Ambitions of Wild Spaces 2020 and the Aichi Targets.

The theme of protected areas figures prominently in this issue of *Wild Lands Advocate*. This fall marks the launch of AWA's "Wild Spaces 2020" campaign. Grace Wark's opening article in this issue introduces you to that campaign, to AWA's intentions to highlight 55 outstanding wild spaces and to encourage governments to incorporate them into an expanded protected areas network.

This campaign follows on the heels of a renewed protected areas commitment from the federal and Alberta governments. That commitment was first outlined in 2010 when Canada embraced the global biodiversity targets agreed to at the tenth meeting of the Conference of the Parties to the 1992 United Nations Convention on Biodiversity. The 2010 meetings were held in Japan's Aichi prefecture and the biodiversity targets set there in the 2011-2020 strategic plan for biodiversity are known as the "Aichi targets."

For Canada, implementing Aichi means meeting a variety of targets. Canada's "Target 1" is to conserve at least 17 percent of the country's landscapes and 10 percent of Canadian coastal and marine areas by…2020. Today, Canada has conserved 10.5 percent and 7.7 percent of those respective areas. There is much to do, in other words, in a very short period of time.

Our second features article, by Joanna Skrajny and Grace Wark, describes one ambitious aspect of the Canadian approach to satisfying its Aichi obligations – the intention to follow the advice of the Indigenous Circle of Experts and include the country's First Nations as genuine partners in this conservation campaign. It also details the concerns of a second advisory group, the National Advisory Panel, that the Canadian approach address "representativeness," the fact that many of this country's ecosystems are not represented adequately in the country's protected areas network. If governments take this deficiency seriously, it could be very good news for grossly underrepresented ecosystems in Alberta such as our grasslands, parkland, and foothills.

Nissa Petterson's piece on the Whitehorse Wildland Provincial Park south of Hinton may be viewed as an important reminder that, in addition to creating protected areas, governments must ensure that park users respect the rules governing access to those areas. Nissa's article on grizzly bear management reflects the link between biodiversity and protected landscapes that is at the heart of the UN Convention and the Aichi targets. If governments don't ensure secure habitat for wildlife then biodiversity objectives may be threatened.

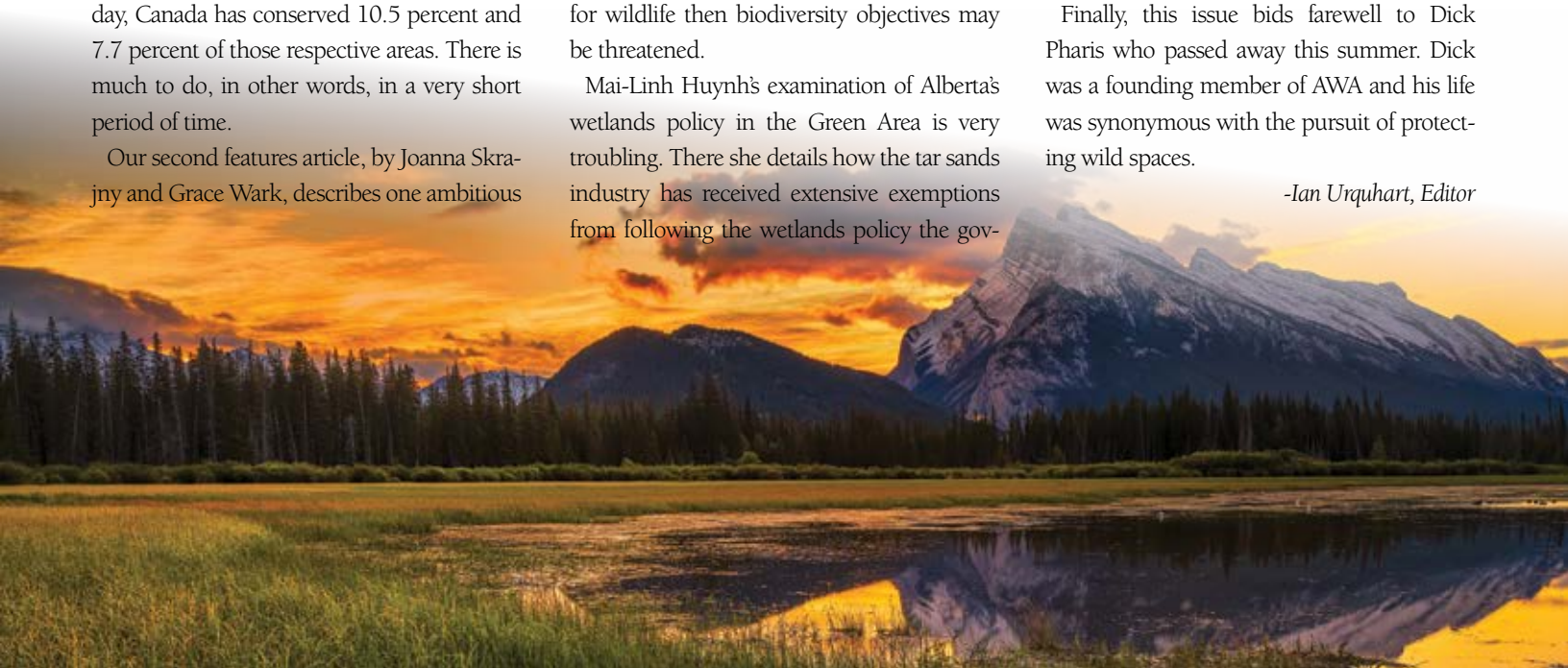
Mai-Linh Huynh's examination of Alberta's wetlands policy in the Green Area is very troubling. There she details how the tar sands industry has received extensive exemptions from following the wetlands policy the government introduced in 2013. These lands, much of which are sacrificed to extract bitumen, will remain anything but protected from industrialization.

My contribution to the protected areas theme in our Features section is to draw attention to a development that may threaten the goal of greater ecosystem representativeness in Alberta. The development considered is the explosive growth of utility-scale renewable energy projects in the province. Albertans can have both a greener energy grid and stronger protections in our grasslands, parkland, and foothills natural regions. But, such a desirable "win-win" will take more leadership from Alberta than we have thus far seen.

You will also find this theme in Andrea Johancsik's story about paddling the Red Deer River – its valley is a long-standing area of concern for AWA. The protected areas theme also is complemented by our interview with Dave Mayhood, one of this year's Wilderness Defender award recipients, in our updates on Alberta caribou and American grizzlies, and in the review of the Kiesecker/Naugle book on energy sprawl.

Finally, this issue bids farewell to Dick Pharis who passed away this summer. Dick was a founding member of AWA and his life was synonymous with the pursuit of protecting wild spaces.

-Ian Urquhart, Editor



Wild Spaces 2020:

Short-term goals on the long road to protection

By Grace Wark, *AWA Conservation Specialist*

Alberta Wilderness Association (AWA) has officially launched Wild Spaces 2020; this campaign aims to increase support and awareness for Alberta's beautiful and irreplaceable wild spaces, wild waters, and wildlife. Over the next year we'll be highlighting 55 magnificent wild spaces: their trials, the innumerable reasons to celebrate them, and how we can support their conservation.

So, what are wild spaces and why are they so important? Wild spaces, whether under legislated protection or not, are the key areas and ecosystems that serve as strongholds for biodiversity, provide ecosystem services (like clean air and water), and give our province its unique charm. These can be well-known wilderness destinations like the Castle or Kananaskis Country, or other awe-inspiring regions you may have never heard of like the Caribou Mountains of northern Alberta's boreal, Goose Wallace of the upper foothills, or Wylie Lake of the Canadian Shield.

These wild spaces have inherent value, not only for their habitat and scenic views, but for their contributions to local economy, global ecological cycles, and human health.

Take for example, Alberta's grasslands and their incredible capacity for carbon storage. Grasslands take in considerable amounts of atmospheric carbon dioxide and store it in the soil for long periods of time. This benefits climate change adaptation efforts, air quality, and, subsequently, civic well-being. However, Alberta's prairies are at risk. The gradual conversion of Alberta's grasslands, only 1.25 percent of which are protected, to agricultural or industrial use can result in the loss of 40 percent of their soil carbon to the atmosphere. Since only seven million hectares of Alberta's Grassland Natural Region remains, this ongoing conversion could have a substantial impact on Alberta's contributions to atmospheric carbon concentrations.

This is where the protection of Wild Spaces – whether grasslands, parklands or your neighbourhood green spaces – draws its human-centric relevance. If we were to protect a larger percentage of Alberta's native grasslands, their ecological services could be retained, their natural splendor could be prolonged for future generations, and they could slow biodiversity decline.

The grasslands of Milk River Ridge PHOTO: © D. OLSON

Short-term goals...

While the protection of Wild Spaces has been part of AWA's vision for more than 50 years, the Wild Spaces 2020 campaign has been inspired by the renewed motivations of the provincial and federal governments to conserve Canadian wilderness. This renewed government conservation impulse is a response to the Aichi targets – the global biodiversity targets developed at the 2010 Convention for Biological Diversity held in Aichi, Japan. Aichi set 2020 as the deadline for reaching its targets, bringing protection and connectivity to unique wilderness areas across the world, and slowing the ever-accelerating decline in biodiversity.

AWA's Wild Spaces campaign focuses on working with governments and other actors to realize the 11th target set at Aichi in 2010. That target is:

"By 2020, at least 17 per cent of terrestrial and inland water areas and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascape."

Since the federal Conservative government accepted the Aichi Targets in 2010, Canada has largely procrastinated in expanding the country's protected areas network. Canada took five years to develop its own biodiversity strategy (Canada Target 1) and another year to roll out its program to achieve the Target, *Pathway to Canada Target 1*. At the end of 2017, seven years after signing, only 10.5 percent of Canada's terrestrial lands and waters were protected and 7.7 percent of the country's coastal and marine areas.

Because Canada's approach has been piecemeal and unenthusiastic, ecosystems remain vulnerable. Over-development, poor planning, and short-term economic incentives combine to offer very little protection of or thought about sustainable biodiversity. While AWA acknowledges the important conservation accomplishments of many private landowners, Canada's governments must strengthen their leadership when it comes to public lands. They must give precedence to the biodiversity targets.

Under the federal guidance of *Pathway to Canada Target 1*, Alberta also made a commitment to protect 17 percent of the province. Among Alberta's successes are 73.5 percent protection in the Canadian Shield and 60.2 percent in the Rocky Mountains (Alberta Parks, 2018). However, we remain wary that the history of poor planning and mismanagement has already led to severe biodiversity losses across the province, and that Alberta still has far to go.

...the long road to protection

While the Aichi targets, and their associated regional initiatives, signify a step in the right direction for global conservation, we need to take further strides to achieve long-lasting, representative protection. As part of Wild Spaces 2020, AWA offers the following caveats to the targets, in hope that they may be applied more earnestly and can realize their greatest potential.

Where the rubber first hits the road for the Aichi Targets is where short-term ambition meets the need for long-term commitment. Conflicting public land uses, existing land-use designations, decades-long land claims and private land disputes are all roadblocks to meeting the 17 percent target by 2020. Many of the processes necessary to protect public lands – such as meaningful consultation – can take longer than the 16 months that remain until the deadline for meeting the targets. It has been shown, time and time again, that realizing conservation goals takes a great deal of time, as we've seen with the decades-long struggles to protect the Castle Wildlands, the Bighorn, or create protected areas for endangered caribou herds. The politics and policy of conservation take time, and with less than two years remaining until the Aichi deadline, I hope 2020 brings both ongoing momentum and a renewed vision for expanding Canada's protected areas network.

Analogous is the need for biodiversity targets to survive changes in government. Both federally and provincially, wilderness conservation has become increasingly politicized. For protection to be effective, the torch has to be passed between governments to ensure that biodiversity commitments are not only achieved, but increase over time. Seventeen percent is merely the beginning of the pathway towards conservation and just a fraction of what nature needs.

The next caveat is that conservation requires well-developed and robust relationships from a broad range of stakeholders. Conservation is frequently put at odds with industry, often polarizing the need for landscape protection against economic growth and material well-being. *If land is being conserved for wilderness values, how can it be leveraged to grow the economy?* This zero-sum assumption is a common misconception. As our grasslands illustrate, economy and environment can not only co-exist, but are in-fact deeply interdependent. The Aichi targets should take into account that relationships between government, industry, local residents, Indigenous communities and environmental stakeholders need to be developed and maintained in order to ensure that the biodiversity targets are realized.

When it comes to these relationships, the federal and provincial governments must continue cultivating their connection with Canada's Indigenous communities; they must put reconciliation at the forefront of conservation processes. Western conservation is a historically exclusionary process; one that has seen Indigenous peoples expelled from their historical territories and traditional land uses discounted. With this in mind, I urge the provincial and federal governments to create space to acknowledge the role of Indigenous communities as creators and stewards of protected areas. The Indigenous Circle of Experts (ICE) has already proposed the creation of Indigenous Protected and Conserved areas (IPCAs) – regional conservation areas to facilitate a larger network of protected ecosystems and empower Indigenous self-determination *[more on ICE and IPCAs in the next article]*. With a firm proposition for Indigenous-led conservation, in contrast to Canada's dark history of Indigenous exclusion, the provincial and federal

governments must include Indigenous Peoples in ongoing conservation efforts.

The final caveat is a critique of Alberta's failure to consider representativeness when it comes to realizing Aichi Target 11. While Alberta has made some progress towards achieving 17 percent protection (currently at 14.6 percent), that protection is not evenly distributed between Alberta's six Natural Regions (Rocky Mountains, Foothills, Grassland, Parkland, Boreal Forest and Canadian Shield). While Natural Regions like the Rocky Mountains and Canadian Shield enjoy considerable formal protection, the remaining Natural Regions – Grassland, Parkland, Foothills and Boreal – have fared poorly. Protecting only 15.4 percent protection of the Boreal, 1.4 percent of the Foothills, 1.25 percent protection of the Grasslands, and a mere 0.9 percent of the Parkland is grossly insufficient to sustain the unique species and ecosystems found within each of these Natural Regions. Each of Alberta's Natural Regions has a unique role in species protection and ecological service provision; these unique roles cannot be fulfilled by other regions that may enjoy more protection. The Government of Alberta should consider insisting on regional representativeness in its 17 percent target. Each Natural Region should have at least 17 percent of its landscapes protected. Alberta should aspire to this version of representative protection.

With these caveats, I feel Alberta's pursuit of the Aichi targets should be seen as one short, but important, step on a longer conservation journey. If history is a useful guide, it's going to be a long and winding journey to establish the protected and connected Wild Spaces that Alberta deserves, but with a lot of love and ongoing support, it's not impossible to achieve. Join AWA as we advocate and celebrate Wild Spaces, to 2020, and beyond.

PHOTO: © N. DOUGLAS


Where the Rockies meet the grasslands PHOTO: © C. OLSON

Healing landscapes and lives: A reconciliatory approach to conservation

By Joanna Skrajny and Grace Wark,
AWA Conservation Specialists

Like that non-contributing partner in your school group project, Canada has made very little progress on fulfilling the international biodiversity commitments made in Aichi Japan in 2010. Those commitments called for reversing the decline of biodiversity worldwide by 2020. In fact, a procrastinating Canada took five years just to roll the Aichi Biodiversity Targets into the federal government's own biodiversity strategy. With that decision Canada made Aichi Target 11 its primary objective. It is Canada's "Target 1."

Aichi Target 11 commits Canada to protecting 17 percent of the country's lands and waters by 2020. The target must be reached in a manner that prioritizes areas of high importance to our ecosystems and is equitable for our society.

While setting Canada's Target 1 marked a symbolic step forward for protected places, like any school project, you need to invest time and resources and collaborate with others in order to make progress. Instead, Canada has had a piecemeal approach to protecting ecosystems, all while the remaining public lands are rife with mismanagement, poorly planned extraction, and habitat degradation.

This relative neglect shows. From 2010 to the end of 2016, Canada only managed to protect an additional 1 percent, bringing our total to an (un)illustrious 10.6 percent.

How will we achieve Aichi Target 11 by 2020?

The federal government likely had this question in mind when, in 2016, it established the Pathway to Canada Target 1 – a plan detailing how exactly Canada will increase its current protected areas network by an additional 40 percent in less than five years.

Thankfully, the government also realized that it shouldn't do this alone and appointed a number of advisory groups, including an Indigenous Circle of Experts (ICE), a National Advisory Panel (NAP), and a Local Government Advisory Group.

Indigenous Circle of Experts

In March 2018, the Indigenous Circle of Experts (ICE) released a report titled *We Rise Together;* this 112-page document outlines a framework and 28 recommendations for Indigenous participation in pursuing the Aichi Target 11. *We Rise Together* is a different breed of report. It embodies the spirits of respect, cooperation and reconciliation, all the while accommodating Canada's historically Westernized approach to conservation. The report itself is many-sided: placing government protections within the context of their colonialist roots, reaffirming the alignment between conservation values and Indigenous ways of living, and offering a strong proposal for Indigenous-led conservation. The sections of the report offer directives for creating "ethical spaces", incorporating ceremony and oral history into planning, and blanketing all relationships in mutual respect and understanding. This humanization of land-use planning is as refreshing as it is long-overdue.

Of critical importance to the report is a reminder that Canada's protected places are part of the legacy of colonialism. The Crown has historically framed protected places as wild, pristine, and people-free; this contributed to a dark history of Indigenous expulsion, human-rights violations, forcible displacement, and targeted persecution. Where protected areas overlap with Indigenous territories, Crown law takes precedence, leading to the frequent criminalization of traditional ways of living.

The ghosts of history linger on, as with the Mikisew Cree of Wood Buffalo National Park. Their territory was "loaned" to the Crown in 1922 under the assumption that they would one day be able to harvest the plains and wood bison when populations returned to sustainable levels. In 2018, the lands of the park have yet to be returned to the Mikisew and the practice of bison harvest remains restricted. Adding further insult to injury, if any of the Mikisew were to hunt bison, they run the risk of heavy fines, incarceration, or even lifetime bans from their community in the Wood Buffalo National Park. While the Park has made certain progress towards reconciliation, its colonial underpinnings continue to haunt the Mikisew people.

Acknowledging this as a shroud over Canada's protected places, ICE chose to move forward, pushing for a strong Indigenous presence in modern day conservation efforts. The central focus of ICE's recommendations is to establish Indigenous Protected and Conserved Areas (IPCAs); these are defined in the report as "...lands and waters where Indigenous governments have the primary role in protecting and conserving ecosystems through Indigenous laws, governance and knowledge systems."

Wood Buffalo National Park PHOTO: © L. BOCKNER, Sierra Club BC

Emphasis is placed on both providing opportunity for Indigenous governments to express self-determination and facilitating inter-governmental relationships of a broad spectrum. In the end, the Indigenous governments would be empowered to conserve wild spaces as they see fit, while also enabling traditional land-uses that have been historically stifled and supporting a diversified economy. Clearly this is a significant challenge to current management regimes.

The new term, IPCA, gives a more textured definition to Indigenous-led conservation regions; it marries core principles from the United Nations Declaration of Rights of Indigenous Peoples (UNDRIP) and the Truth and Reconciliation Commission of Canada to pre-existing frameworks for conservation. IPCAs can take many forms: Tribal Parks, Indigenous Cultural Landscapes, Indigenous Protected Areas, and Indigenous Conserved Areas. The three core components of an IPCA are that it is Indigenous-led, it represents a long-term commitment to conservation, and it elevates Indigenous Rights and Responsibilities.

IPCAs provide a dual-opportunity of healing, one for both Canada's landscapes and their most long-standing inhabitants. At this point, reconciliation efforts cannot be separated from conservation and protected places. *Together We Rise* brings revitalization to the heart of conservation – of lands, of culture, of language and of spirit.

National Advisory Panel

The National Advisory Panel (NAP) has developed a complementary report to that of the ICE, *Canada's Conservation Vision*; its compatibility rests in its emphasis on reconciliation and Indigenous participation at the forefront of conservation. The report begins by emphasizing the serious biodiversity crisis that is currently gripping the planet and underlines Canada's responsibility as caretakers of 20 percent of the world's freshwaters and almost a third of the planet's land-based carbon storage. Clearly, we need more protected areas and we will need to move above and beyond 17 percent so that we are not only taking care of the planet, but so that the planet can take of us too.

The panel also points to the fact that all federal political parties support creating an extensive network of protected areas in Canada. In 2015, the House of Commons Standing Committee on Environment and Sustainable Development unanimously recommended that "the Government of Canada set even more ambitious targets for protected areas than those established in the Aichi Target 11."

However, the NAP also recognizes that it is imperative that the establishment of new protected areas is done correctly from the start. It identified a number of overarching elements necessary to ensure that conservation efforts are effective and will last the test of time.

The first of those elements is the need to create "ethical space" for engagement among groups with different worldviews, in particular, among Indigenous and non-Indigenous peoples.

It's important that the report places Canada's protected areas work in the context of reconciliation, emphasizing that it is imperative that "all short-term and long-term actions toward biodiversity conservation in Canada be undertaken in a way that contributes to reconciliation between Indigenous and non-Indigenous peoples in Canada."

Ethical Space – an environment where two societies with fundamentally different experiences and ways of looking at the world meet together, listen deeply, and then work together equally to come to solutions.

This will require the establishment of an ethical space where Indigenous Peoples have an equitable place both in the creation and management of protected areas. Again, this would amount to a significant departure from business as usual.

The NAP also highlights a lengthy statement from the principles outlined by the Truth and Reconciliation Commission:

> *reconciliation between Aboriginal and non-Aboriginal Canadians, from an Aboriginal perspective, also requires reconciliation with the natural world. If human beings resolve problems between themselves but continue to destroy the natural world, then reconciliation remains incomplete. This is a perspective that we as Commissioners have repeatedly heard: that reconciliation will never occur unless we are also reconciled with the earth.*

Each and every one of us has a part to play in reconciliation. Creating and maintaining protected areas provides an amazing opportunity for Canadians to advance reconciliation efforts.

One of the biggest obstacles to the creation of protected areas was noted earlier: Canada's haphazard and increasingly politicized approach. Despite the fact that protected areas have clear economic, health, and societal benefits, progress on establishing new ones has essentially stalled.

The NAP identifies this as a critical obstacle and states a need to fundamentally overhaul our approach to establishing protected areas. It recommends establishing a new federal Nature Conservation Department, which would be overseen by an independent Advisory Council that would not only advise on issues but also report on progress.

The NAP report also shines when it comes to recommending how Canada should prioritize the creation of new protected areas. In the short term, it recommends starting with initiatives already underway. This makes good sense as time is rapidly running out to achieve 17 percent protection by 2020. For example, they identify that Alberta has identified potential areas to protect caribou habitat during range planning. These "early opportunities" alone would bring Canada up to an estimated 14 percent.

The report also discusses existing and potentially new legal frameworks for the establishment of Indigenous Protected Areas and lists several opportunities that Indigenous communities have identified across Canada. For example, the Mikisew Cree First Nation has identified the importance of expanding protection around Wood Buffalo National Park in wood bison habitat and the Peace Athabasca Delta.

Moving forward, the NAP recommends a long-term strategic approach to biodiversity conservation, focusing on gaps in the current protected areas network. Currently, there is a huge gap in protecting Canada's 194 unique ecoregions. The reports points to habitat fragmentation as the biggest threat to biodiversity; it recommends creating a protected areas network with large cores of undisturbed areas that are connected by smaller corridors or "stepping stones." Aquatic ecosystems – such as wetlands, rivers, and lakes – act as Mother Nature's highway system, so it's no surprise that the report also underlines the critical need to protect more of Canada's freshwater systems.

AWA's Wild Spaces 2020 campaign focuses on gaps within Alberta's own protected areas network. While some areas, such as our Rocky Mountains, are relatively well protected, there is a critical need to increase protection of other natural regions, such as our grasslands and foothills. You can read more about what AWA will be doing to advance Alberta's protected areas network in Grace's article "Wild Spaces 2020: Short-term goals and the long road to protection."

Overall, we found both reports refreshing and ambitious. The only question that remains, and it's fundamentally important, is whether federal and provincial governments will actually implement the recommendations made. We are excited to be a part of the future anticipated by these reports – where a diverse group of people come together to make the world a more biodiverse and equitable place.

Wood Buffalo National Park PHOTO: © L. BOCKNER, Sierra Club BC

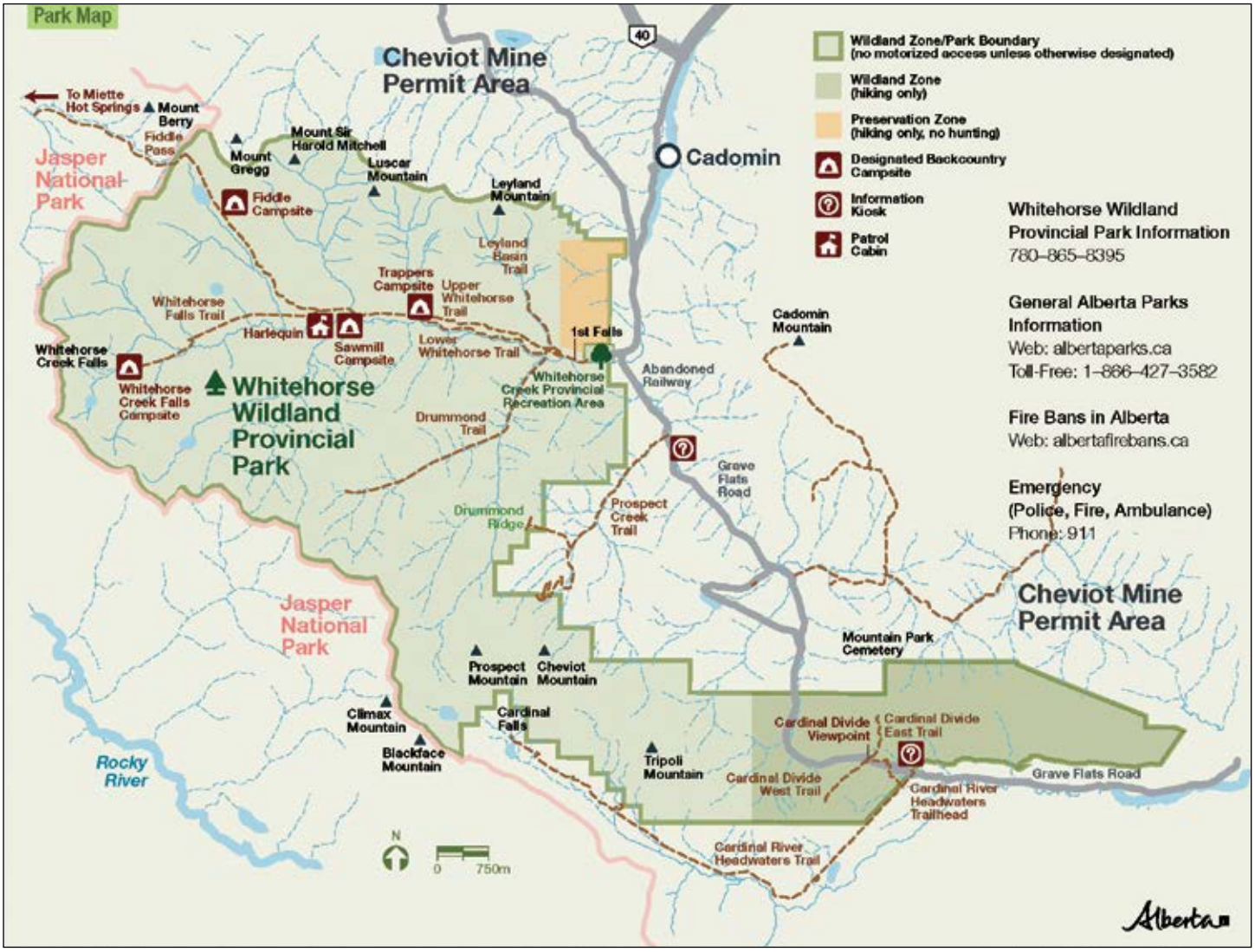
The Cardinal Divide, Whitehorse Wildland Provincial Park, and Their Stewards

By Nissa Petterson, *AWA Conservation Specialist*

The Whitehorse Wildland Provincial Park is a hidden gem, unknown to many within Alberta; if you haven't heard of it, you are not alone. Located about 60 kilometres south of Hinton and a stone's throw from the hamlet of Cadomin, Whitehorse Wildland Park is hidden away in a relatively remote region, comfortably "off the beaten path." In late July, Alison Dinwoodie (an AWA Wilderness Defender), Kristen Anderson, and Elisabeth Beaubien took AWA staff on a guided trip through the park to understand the new and ongoing issues afflicting the area.

At 175 km^2, the park is relatively small, but it is a very important place to protect due to its ecological biodiversity. The Whitehorse Wildland Park is situated in the front ranges of the Rocky Mountain Natural Region, with its western boundary against the eastern border of Jasper National Park.

If you can successfully navigate the rough and bumpy "roadways" of Grave Flats Road (having a spare tire handy is highly recom-



CREDIT: GOVERNMENT OF ALBERTA

mended), your efforts will be rewarded by an exceptional wilderness experience. With the majority of the park located above the tree line, impressive views of the Rocky Mountains and Foothills are endless. And the park is not just appealing to people; its wild spaces are vital habitat for a variety of wildlife including bighorn sheep, elk, moose, wolves, cougars, marmots, mountain bluebird, horned lark, and golden-crowned sparrow. In addition, the Whitehorse Wildland Park contains important habitat for some of Alberta's at risk species; the park is a migration corridor for threatened grizzly bears and the banks of its clear mountain streams are home to the harlequin duck.

Despite its abundant natural splendor, the *pièce de résistance* of the Whitehorse Wildland Park just might be its noteworthy topographical feature: the Cardinal Divide. The Divide is a wide ridge that separates two major watersheds, the Athabasca River to the north, and the North Saskatchewan River, to the east which contribute to the area's famed biodiversity.

The Grave Flats Road passes through Cadomin, then past the extensive Cheviot mine site. For over a century, intermittent coal mining in this area had supported surrounding communities.

In the 1980s, a new extension of the mine was proposed east and west of the Grave Flats Road. Because of the sensitive ecology of the terrain, an Environmental Impact Assessment was carried out. The mine was approved but the Cardinal Divide and the rest of the headwaters would be protected. This resulted in the designation of the Whitehorse Wildland Provincial Park in 1998. No motorized traffic would be allowed, to prevent the destruction of the sensitive alpine and subalpine terrain and its vegetation.

Teck Resources Ltd. currently operates the Cheviot mine extension to the east while the two completed pits west of the Grave Flats Road are now waiting to be revegetated before they will be reopened to the public.

When you arrive at the Cardinal Divide viewpoint parking lot there are two hiking trails – one heading east, the other heading west. The Cardinal Divide East Trail takes you to the top of the ridge and, after a short and relatively easy hike, you can experience and enjoy the heart of the Whitehorse Wildland Provincial Park. The trail winds through lush alpine meadows and subalpine slopes which are the canvas for the unique and beautiful flora communities of the park.

The plant diversity is one of the most exceptional features of the park; it boasts over 250 species of plants, some of which are considered rare or to have unusual distribution. This diversity of flora is thought to be attributed to a glacial refugium or a "nunatak." A nunatuk is an exposed ridge that was high enough to remain glacier-free during the last ice age, allowing its vegetation to survive. Although prominent, this hypothesis hasn't ended the debate surrounding the source of the Divide's biodiversity.

The flower communities of the Cardinal Divide have charmed and made a lasting impression on many people who visit this place; they have captivated people like Alison, Kristen, and Elisabeth. From organizing volunteer reclamation weekends to writing a field guide for the Whitehorse wilderness, these dedicated people have devoted a considerable amount of time and energy to exploring, documenting, and advocating for the responsible management and use of these public lands. We were fortunate to have these people, who work tirelessly to protect the wilderness values of the park, lead AWA's trip to the Cardinal.

As we made our way up the eastward trail, a rock cairn was obvious at the top of the ridge. These human-made stacks of stones have spanned many cultures, and therefore, have a variety of purposes. Historically cairns have been used as burial monuments, for hunting and defence, to indicate food caches, or land guides for marine navigation. Today's cairns in the Rockies are more likely to serve as hiking trail markers or personalized artistic creations. Yes, the modern art of stone balancing is a real thing. But there's one attribute that spans all cultures and era: they're manmade, a sign of human presence, and our guides were not particularly pleased with their contemporary uses. They are just another way in which this fragile environment is disturbed unnecessarily.

Regardless of their origin or significance to their creator, the resurgence of these statues in our wild spaces changes their meaning entirely. Nowadays these cairns often are symbolic of current recreation behaviors – the need to show that "I was here." A more passive approach to exploring wilderness – "leave no trace" – is challenged by the need some have to show they were there.

While constructing a rock cairn may be relatively minor in terms of impact, it is not without repercussions. Rocks provide a

Off-trail OHV damage above Cardinal Falls CREDIT: AWA

The Cheviot Mine PHOTO: © E. BEAUBIEN

multitude of ecological services through the microhabitats they create; their surfaces can be the protection needed for sheltering new growth, or facilitating the attachment and growth of moss and lichen. Beneath them there could be habitat for insect species that will be a meal for the next grizzly bear that comes along. Regardless if rocks are removed from streams or the top of a ridge, relocating these rocks is actively dismantling the biological communities that depend on them. If we cannot acknowledge the complexity and sensitivity of ecosystems, we open the door to less conscientious interactions with nature. Unfortunately, the Cardinal Divide has seen a great deal of this behaviour and curbing it has been an arduous battle for the stewards of this area.

On a much greater scale than building cairns, the Cardinal Divide is currently subjected to a significant amount of motorized recreation. This activity takes place despite the fact that motorized recreation is prohibited in the Park. Scars old and new are carved into the landscape far beyond the boundaries of the single designated off-highway vehicle (OHV) trail, the Cardinal Headwaters Trail, that runs just outside the south/southeastern boundaries of the Park. The Cardinal Headwaters trail transects a subalpine valley sandwiched between the Whitehorse Wildland Provincial Park and Jasper National Park. Over time, the trail has become severely eroded and rutted and now braids in between protected areas. Vegetation cover of the soil has been completely eliminated; continuous traffic closes the window for regeneration. These are the unfortunate consequences of inappropriate land use and the growing epidemic of poorly regulated OHV use.

Near the headwaters of the Cardinal River PHOTO: © J. SKRAJNY

The Cardinal Divide's biodiversity clearly cannot tolerate this form of recreation. More signage and, most importantly, more enforcement of the regulations needs to happen. Without these steps these so-called protected lands will continue to be degraded. What is the purpose of formally protecting unique ecosystems such as the Whitehorse Wildland Park if inadequate protected areas management only facilitates its destruction?

The forms of high-impact recreation that plague the landscapes of the Whitehorse Wildland Park are found in too many of Alberta's wilderness areas. Governments and user groups alike must give a very high priority to re-educating recreationists about the importance of treading lightly in our wilderness areas. AWA hopes that with increased awareness, the likelihood of recreationists choosing to partake in high-impact activities will diminish. This, in turn, will continue to build momentum for caring and protecting Alberta's wilderness areas. We, as members of the public, must act as stewards and task ourselves with the responsibility of propagating an approach to the use of public lands that respects the fragile balance often found there.

So the next time you're out in Alberta's wild spaces, take a minute to think about the impact you may be having before you pick the last beautiful wildflower, disturb the undergrowth to build a rock cairn, or build a dam in a shallow stream to swim in. Such thoughts will encourage us to recognize our duty, as the Cardinal Divide's stewards know so well, to care for these valuable areas.

AWA would like to thank Alison, Kristen, and Elisabeth for taking staff on this hike and to thank Alison for her comments on this article.

Shortfalls of Alberta's Wetland Policy in the Green Area

By Mai-Linh Huynh.

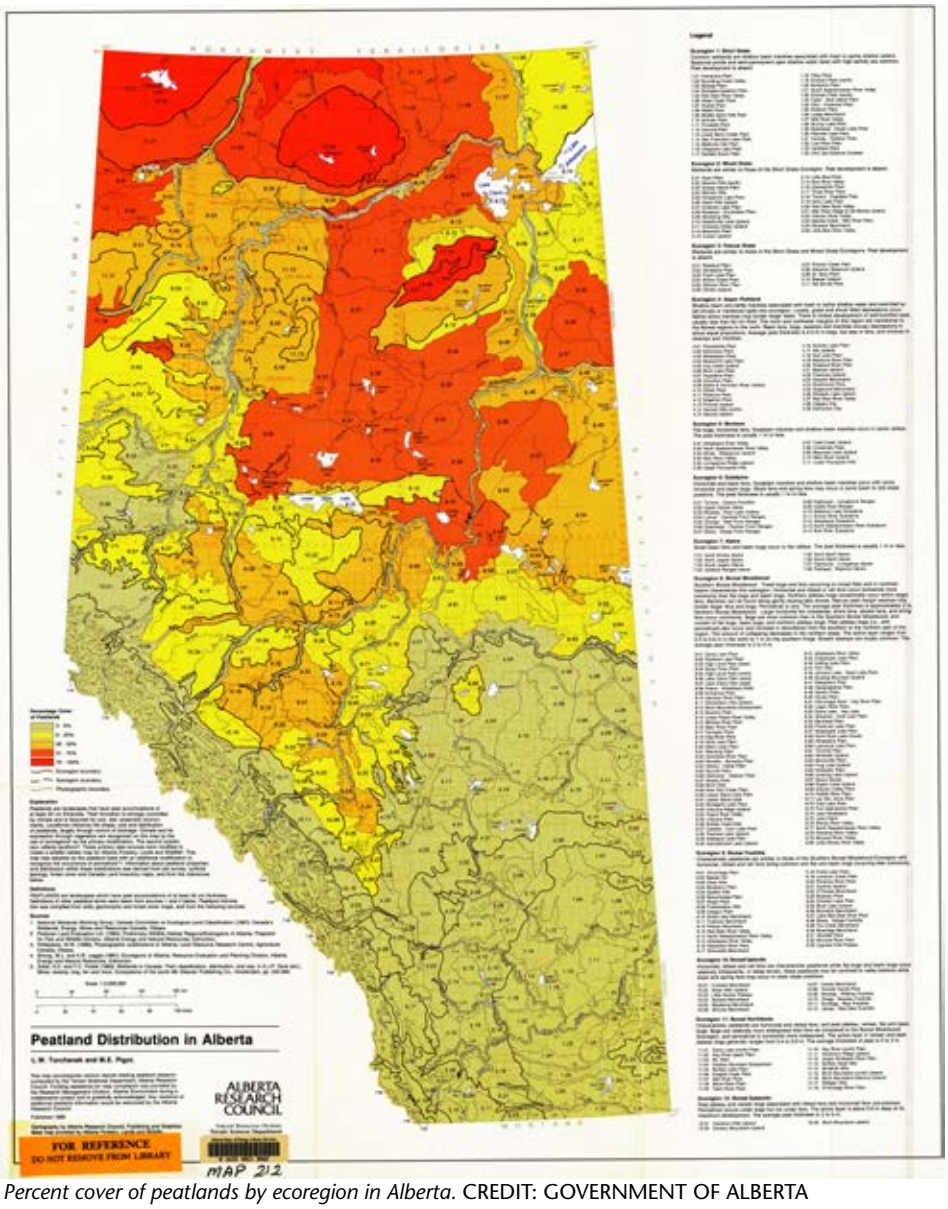
Mai-Linh is a recent volunteer researcher at AWA and has significant former regulatory experience in federal environmental assessment. She enjoys traveling near and afar to discover and experience Earth's natural wonders.

Before GPS devices and smartphones, I used aerial photographs to navigate through the backwoods of the Foothills Region and survey for long-toed salamanders ("Sallys") in my youthful field days. In times when the underbrush would be too much to bear, I would follow animal trails hoping they would eventually lead me to the wetland I intended to survey.

Having worked alone, I recall the serenity and solitude in the presence of these wetlands – a trill of a songbird, the buzzing of flies, the soft rustling of trees and sedges. It was on those hot sunny field days where I would soak my feet in glimmering cool waters, consume my bagged lunch, and review my field notes. How lucky I felt then and now to personally experience and understand the value these wetlands had to offer, while cognizant that not all Albertans will have the opportunity to experience them in their lifetime or to know of their mere existence. Truth be told, it feels gratifying to write an article on a subject very dear to me and one I believe is largely undervalued by and unfamiliar to many.

Boreal Wetlands

Alberta's boreal wetlands are a critical part of the boreal forest region that covers over half the province. Administratively, our forested public lands are called the Green Area. Green Area wetlands consist mostly of organic peat-forming wetlands called "peatlands" (bogs, fens) and also include mineral wetlands (swamps, marshes, and open water). Peatlands occupy 103,000 square kilometres of Alberta, 16.3 per cent of the total land base, and between 30 and 40 percent of northern boreal areas. Peatlands play a vital ecological role for flood and drought/fire attenuation, biodiversity, and as wildlife habitat. They also act as a natural water filtration system and a massive storage sink for carbon.



Percent cover of peatlands by ecoregion in Alberta. CREDIT: GOVERNMENT OF ALBERTA

Across Canada, boreal wetlands are threatened by anthropogenic activities that include commercial forestry, petroleum extraction (oil, gas, bitumen, coal-bed methane), mining (bitumen, coal, peat, ore, and diamonds), agriculture, climate change and major hydrologic construction projects. Here in Alberta, petroleum extraction takes centre stage when it comes to the large-scale loss of peatlands. While some proposed projects have not proceeded, as of January 2018, 8.1 million hectares or 58 percent of Alberta's total oil sands area remains under oil sands leases.

In 2012, University of Alberta scientists Rebecca Rooney, Suzanne Bayley, and David Schindler estimated losses of up to 28,000 hectares of Alberta wetlands over the next several decades from four existing oil sands surface mining projects alone. In 2009, Peter Lee and Ryan Cheng estimated a total of 36,064 hectares of converted peatlands from seven approved and five proposed oil sands mines and as much as 202,411 hectares of peatlands that have been or may be changed from existing *in situ* projects and undeveloped leases. Even on leases that are not ultimately developed, extensive surface disturbances that often accompany seismic assessment of oil, gas and oil sands formations can sever hydrologic connections. This can impair functions of peatlands and other wetlands.

Wetland Policy Scope

Until recently, no wetland policy existed for the Green Area. In 2013, the Alberta Wetland Policy (the Policy) was released and replaced the 1993 Interim Policy "Wetland Management in the Settled Areas of Alberta." The Policy was implemented in the White Area (settled area) on June 1, 2015 and implementation in the Green Area followed a year later on July 4, 2016.

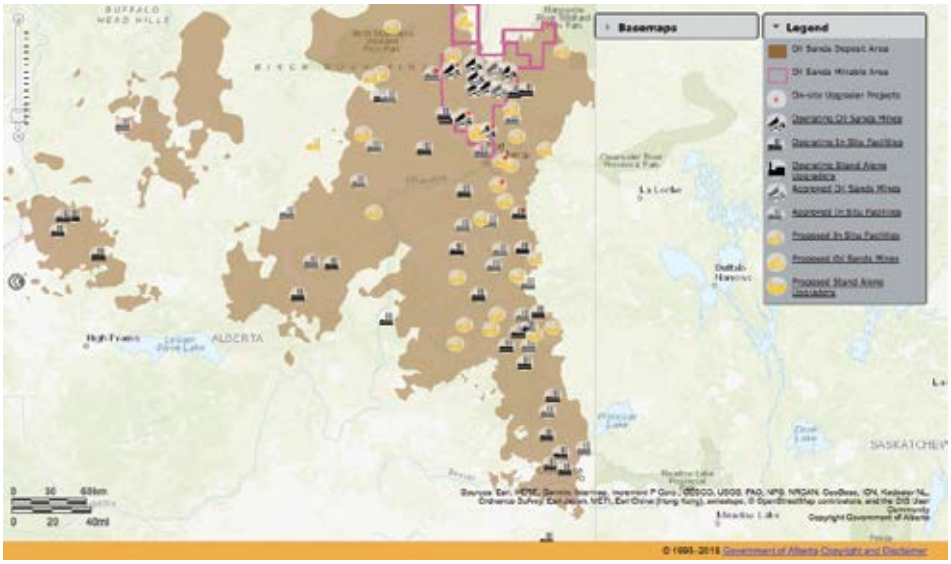
The Policy's primary aim is to protect wetlands of the highest value, to conserve and restore wetlands in areas of high loss, to avoid and minimize negative impacts to wetlands and, where necessary, to replace lost wetland value. The objectives of this Policy are an improvement over the previous policy vacuum for the Green Area – a wetland management system that includes economic and ecological valuation of water resources. At best, the Policy recognizes the protection of high valued wetlands, particularly in the Prairie pothole region (i.e. in settled areas) where wetlands have experienced significant historical losses. In theory, this Policy will conserve and restore wetlands in these areas of high loss.

Boreal wetlands in the Green Area however may not benefit equally from this Policy. There are noteworthy issues of concern – the first being that the Policy **does not apply** to "administratively complete" project applications received prior to July 4, 2016. For example, activities with approved project boundaries, completed environmental impact assessments, and completed pre-disturbance assessments regulated by Alberta Energy Regulator (AER) and Alberta Environment and Parks (AEP) **will not** be subject to the Alberta Wetland Policy.

Future foreseeable projects deemed "administratively complete" prior to July 4, 2016 include Teck's Frontier Oil Sands Mine, the largest proposed open pit mine to date. The Frontier Oil Sands Project's environmental impact assessment was deemed complete under the *Environmental Protection and Enhancement Act* on May 16, 2016. In Teck Resources' supplemental filing (May 2017), it stated that the Policy would not apply to the Frontier Project. Although Teck Resources concurs that wetland offsets might be appropriate for achieving their "voluntary vision of having a net positive impact (NPI) on biodiversity", it does not propose any commitment or mitigation to replace wetland losses incurred on the post-closure landscape.

The fact that the province's highest profile industry of open pit and extensive *in situ* oil sands projects is almost completely excluded from this Policy significantly weakens the Policy in the Green Area. Wetlands were dominant in the mineable oil sands area, however there is no requirement for these operators to restore these wetlands to a pre-disturbance state or to replace wetlands what would be indefinitely lost. Rather, reclaiming land to a productive status equivalent to what existed prior to disturbance, called "equivalent land capability", is provincially required for most landscape impacts. Equivalent land capability does not mean that the original ecosystem must be replicated in the restoration phase.

The Policy also does not acknowledge or require operators to compensate for the temporal loss of wetland function, which can span decades from the start of exploration activities to when the project site is fully decommissioned. Frequent, temporary, and cumulative wetland losses can easily contribute to a consistent and considerable net functional loss over time.



The oil sands industry has escaped the liability of restoring valuable wetlands and their ecological function to their original state. Future foreseeable projects deemed "administratively complete" prior to July 4, 2016 will not be subject to the Alberta Wetland Policy. SOURCE: © GOVERNMENT OF ALBERTA, ACCESSED AUG 2018 (http://osip.alberta.ca/map/).

Policy Challenges

The Policy's focus on minimization and reclamation in the Green Area is based on the premise that wetland losses caused by the petroleum extraction and forestry sectors are *temporary*. Should reclamation be unsuccessful, operators will be required to compensate for wetland loss vis à vis the replacement mitigation option.

The replacement mitigation option includes one or a combination of the following actions: purchasing available credits from a third party *wetland bank*; paying into an *in-lieu fee program* where a third party will expend fees to restore, enhance, construct wetlands; and constructing, restoring or enhancing wetlands in advance or soon after losses occur. The replacement program is still under development.

I spoke to Thorsten Hebben, Director of Surface Water Policy at AEP, about the Policy's potential to protect boreal wetlands in the Green Area. He stated that the Policy's focus in the Green Area is to minimize front end impacts by promoting beneficial management practices, updating codes of practice, as well as developing directives on reclamation and wetland construction. He added that, for grandfathered project applications, the regulatory review process is the current mechanism through which new policy and operational requirements are incrementally introduced into the regulatory system. Hebben also confirmed that financial securities for reclamation remain unchanged.

Without changing the financial security system, industry-led reclamation approaches may continue to cast uncertainty and mistrust as only a small percentage of a project's incurred financial liabilities are held in trust by government until close to the project's end-of-life, when requirements ramp up. Correspondingly, reclamation time frames are measured in centuries and bonding/liability agreements are not. Operators need to be held accountable during the time which reclamation is proven successful or unsuccessful post-closure. As such, liability agreements need to be updated or established to reflect this wetland replacement mitigation requirement. Furthermore, peatland reclamation is highly uncertain because of the "insufficient available area, time requirements for peat development, gaps in reclamation knowledge, and expense," as stated by University of Alberta scientist Lee Foote.

Rooney, Bayley, and Schindler estimated that the closure landscape for most of the mineable oil sands region would be predominantly constructed upland forest instead of peatlands (*refer to the following table below*). The net effect of this landscape transformation on biodiversity and ecosystem functions as well as loss of carbon storage potential has yet to be assessed and remains a serious concern to many conservation scientists.

Wetland Valuation

For Green Area applications received after July 2016, proponents are required to assess the relative value of wetlands where there is proposed wetland loss. They will do so by using the ABWRET-A assessment method developed by AEP. This method includes field observations collected by the wetland assessor, spatial data compiled by AEP, and models to generate scores on wetland functions such as water storage, fish and wildlife habitat, fire barrier, and human use. Regrettably, this valuation method contains no assessment of carbon sequestration, which unjustifiably overlooks the vital role that peatlands play in mitigating climate change.

An overall wetland value category is then assigned (A, B, C, or D; Category A being the highest value) after applying a **local loss rate or abundance factor**. The Government of Alberta states that the category value is "intended to inform planning and regulatory decisions around wetland avoidance, minimization and replacement, and is used to determine the replacement ratios where that is required."

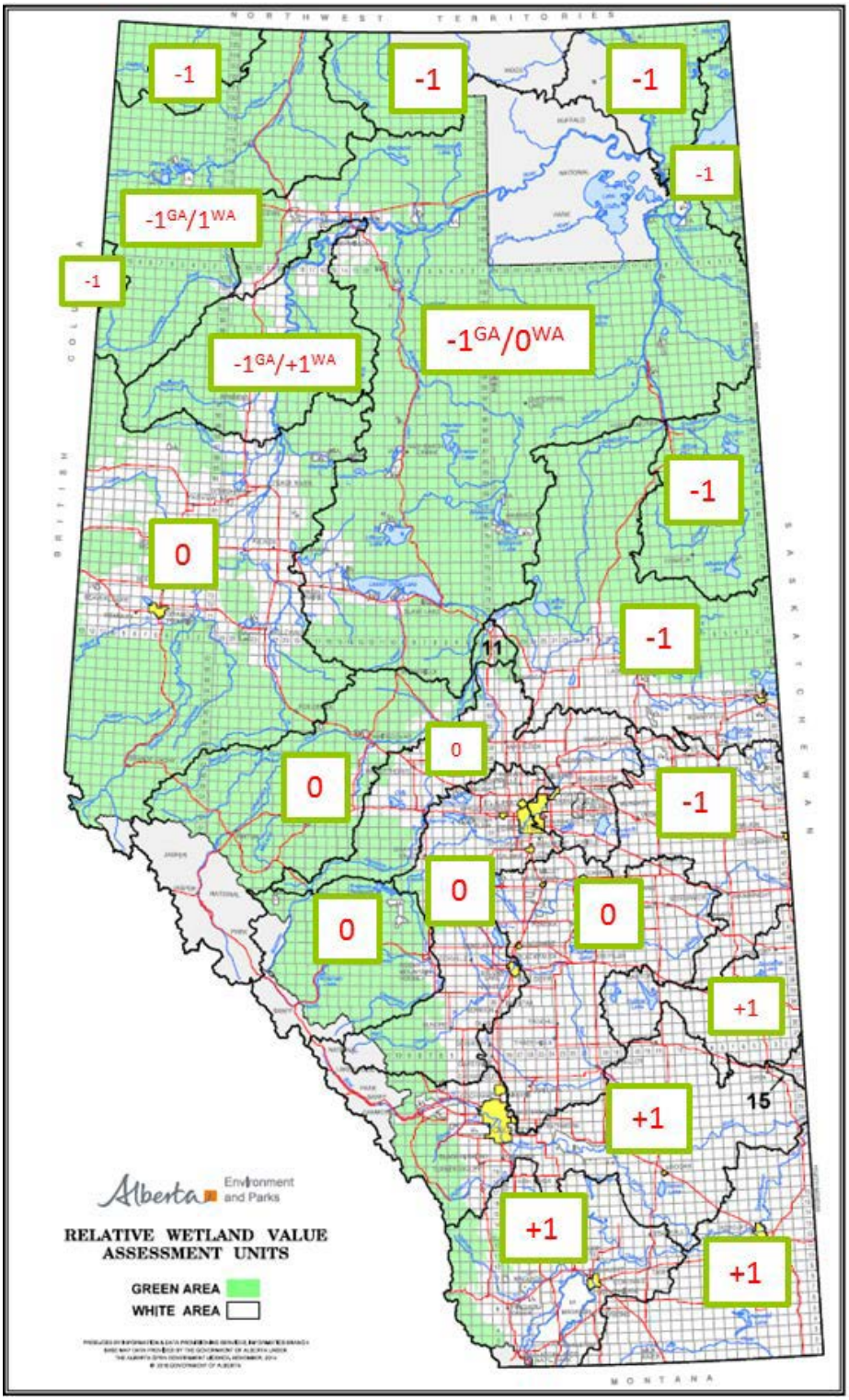
The wetland 'abundance factor' raises wetlands' values by one 'grade' within the assessment unit where there is documented high historic loss. This is appropriate given one of the Policy's primary aims. However, in assessment units where boreal wetlands are estimated to be in relative abundance and have low historic loss, application of this factor results in downgrading their wetland value where A values turn to B's, B's to C's, and C's to D's. These changes in value category would consequently minimize replacement requirements.

Applying neutrality to abundance would have been a more rational approach, considering the important roles that wetlands play in retaining water, carbon, and diverse habitats wherever they occur. However, a discriminatory decision was made to **reduce** almost all wetland values by one grade in assessment where they are now estimated to be 'abundant' (according to Hebben, the top 5 percent of 'A' wetlands will remain 'A', regardless of the abundance factor). Application of this abundance factor in the Green Area explicitly defaces the true value of boreal wetlands. The fact that wetlands in the Green Area are downgraded by this valuation method certainly will not further the cause of protecting peatlands and preventing their ongoing loss and disturbance in the oil sands region and beyond.

Description	Net Change - pre vs post (ha)	Net Change (%)
Upland Forest	15,473	40
Peatland (bog and fen)	-12,414	-67
Wetland (peatland, graminoid, marsh, swamp, shallow open water, riparian scrubland, and littoral zone)	-11,761	-36

Table 1. Net change in landcover types: Upland Forest, Peatland, and Wetland to result from oil sands mining reclamation based on baseline reports and closure plans for the Horizon, Jackpine-Phase 1, Kearl, and Muskeg mines (adapted from Table 3, Rooney et al. 2012).

Hebben explained that the abundance factor was based on research developed by an independent consultant. This research focused on the settled portions of the province and applied spatial modelling of historical loss and wetland abundance that assisted AEP in establishing the abundance modifiers (+1, 0, -1). Despite the little data and low confidence in estimating historical loss and wetland abundance in the Green Area, the abundance factor of -1 was applied and extrapolated to this Area.



Map of regional abundance factors applied to ABWRET-A relative wetland value categories. Wetlands in the Green Area are downgraded by one value category (e.g., from A down to B, etc.) in sub-watershed areas denoted by "-1", which covers a large extent of Alberta's boreal region. WA - White Area. GA - Green Area. SOURCE: GOVERNMENT OF ALBERTA.

Hebben acknowledged that the -1 modifier is only interim until more data is collected in the Green Area. He also implied that loss of wetland function, for example the loss in the capacity to support an abundance and diversity of songbird or mammal species, may take precedence over loss of wetland area or numbers when considering revisions to the abundance factor.

Conclusion

By the end of 2019, AEP's goal is to have a centralized system for the administrative review of wetland applications. As well, it plans to have a provincial database for wetland inventory and monitoring. Currently, information on policy outcomes and reporting is not publicly available.

The Alberta Wetland Policy has disappointing implications for the health of boreal wetlands in the Green Area. Boreal wetlands are not adequately protected by this Policy and, by exempting complete project applications from the Policy, wetland loss and disturbance may not be restored to its original state in the oil sands region. In addition, wetland valuation methods devalue Green Area wetlands by applying the abundance modifier, resulting in diminished replacement requirements. The Policy also has no mechanism to deny applications that propose to destroy high valued wetlands.

As the replacement program under the Wetland Policy is still under development, it is too early to determine whether restoration of wetland area and function could be accomplished. Through established wetland inventories and monitoring, only time will tell whether this Policy is effective in achieving its wetland restoration objectives. It is important for independent researchers, and groups like AWA, to continue to update the public and remain an important stakeholder as the Policy implementation progresses.

Special recognition is owed to Carolyn Campbell, AWA Conservation Specialist, for her guidance and contribution to this article and in whole, to my research on Alberta's Wetland Policy implementation in the Green Area.

Grizzlies, Routes, Roads and How to Measure Disturbance

By Nissa Petterson, *AWA Conservation Specialist*

Grizzly bears once roamed Alberta's expansive prairies, with plenty of habitat and prey to sustain them. Now, their historical ranges have shrunk drastically, with only a mere fraction of the population remaining on Alberta's public lands.

The "threatened" species-at-risk designation of grizzly bears within Alberta is the ultimate result of a series of unfortunate events. Some might say that the bears were in the wrong place at the wrong time – a justification offered to deflect attention from the fact that our patterns of settlement and behaviour have dramatically influenced the predicament grizzlies find themselves in.

In reality then, the blame lies with us. Grizzly bear populations within Alberta declined primarily due to human-bear conflicts. Bear mortality increased over the years due to poaching, misidentification (i.e., "I thought it was a black bear"), collisions, or active removal of "problem bears" from areas frequented often by bears and people. The common denominator amongst all of these mortalities is the lack of secure habitat; bears are running out of space and this is largely due to the ever-increasing network of trails and roads. This network incrementally fragments more and more of Alberta's wilderness.

The negative impact of wilderness access on bears is not a new revelation. Literature has repeatedly demonstrated that roads not only have a direct footprint on ecosystems, but also facilitate human access into wilderness areas that were previously inaccessible, and therefore, "secure" for wildlife.

A meta-analysis released in July 2018 (Proctor, McLellan, Stenhouse, Mowat, Lamb, Boyce) reviewed existing scientific literature on the relationship between grizzly bears, human motorized access, and the efficacy of motorized access control as a conservation measure in Alberta and British Columbia. While circumstances vary between provinces, the evidence made it blatantly clear that motorized access into grizzly bear habitat damages the survivability of the species.

The scientific literature analyzed in the review identified a wide range of impacts to grizzly bears from human motorized access. It placed particular emphasis on improving female grizzly bear survival to increase population trends, with successful conservation efforts focusing on roads. Roads were shown to influence grizzly bear habitat use and avoidance, home range selection, and population fragmentation. Roads within grizzly bear habitat limit access to important food sources and can even displace bears entirely from a "home" area. Safe migration for bears within and between habitat areas is also severely compromised by roads. They have the capacity even to restrict movement entirely, ultimately isolating regional populations from each other.

Given that motorized access has such a large negative effect on grizzly populations, the obvious solution is to manage access – but how? The review notes that much of the literature supports minimal to no linear disturbance if possible, or an open road density threshold, usually noted as a limit on kilometre of road per square kilometre of area (km/km^2). While circumstances vary depending on location, no universal open road density threshold exists; however, much of the literature reviewed adheres to the magic number of 0.6km/km^2. Above this threshold, the overall viability of grizzly bear populations is seen to decrease. Areas with high road densities are likely to become population sinks – habitats where grizzly bear death rates exceed birth rates.

In order to maximize the efficiency of motorized access control as a grizzly bear conservation strategy, the review suggests taking measures if any of the following conditions are met:

1) Roads exist in the highest quality grizzly bear habitats, or in areas with population limiting energy rich food resources (salmon, berries, etc);
2) Open road densities exceed 0.6 km/km^2;
3) Less than least 60 percent of the unit's area is secure habitat (i.e. > 500 m from an open road in patch sizes of at least 10 km^2 to facilitate grizzly bear movement).

So, have managers in Alberta and British Columbia integrated this concept into their conservation objectives? The review details how the two provinces have adopted different management strategies.

With the exception of several local initiatives, the province of British Columbia currently does not manage for road density across the province. The province assesses the conservation status of grizzly bears by means of Grizzly Bear Population Units (GBPU), with each unit being approximately 13,500km^2 in size. The review found that motorized access controls are most effective when extensively monitored and when they are integrated on a smaller scale represen-

tative of multiple female grizzly bear ranges within a larger GBPUs.

In Alberta, the current Alberta Grizzly Bear Recovery Plan Draft (2016) outlines a series of seven Grizzly Bear Management Areas (BMAs) which have a mean size of 24,762 km^2, and are established to manage grizzly bear populations. This draft sets road densities for the Grizzly Bear Watershed Units (GBWUs) that are found in each BMA. GBWUs are approximately 500km^2 in size and typically include several overlapping female home ranges. This approach was intended to partition road density management across the larger BMAs.

In addition to this, Alberta has developed a habitat-structured access management system by subdividing BMAs into two habitat zones, the Recovery and Support Zones. The Recovery zone is then further delineated according to habitat quality and security: Core and Secondary habitat. Core grizzly bear habitat offers high habitat quality and security while Secondary habitat either connects Core areas or buffers them from areas with higher human activity. Alberta's recovery plan draft establishes open road densities for the Grizzly Bear Watershed Units within BMAs as <0.6km/km^2 for Core habitat, and <0.75km/km^2 in the Secondary habitat.

Although the concept of mitigating human motorized access has been integrated into Alberta's grizzly bear recovery plans, this review explores why Alberta hasn't been successful to date. The review points out that there is uncertainty over what is considered an open, closed, or restricted access road, and what vehicles can travel on them in Alberta's Recovery Plan. Recreational trails for off-highway vehicle (OHV) use exist in these Core and Secondary areas, and are not included in the open road density calculations, despite the fact they still disturb grizzly bears. By not considering these trails in road density thresholds, we inadequately depict the level of human access and disturbance in the Recovery zones, and therefore the efficacy of motorized access control on grizzly bear conservation.

The review also notes that the current motorized access thresholds for open road density in both zones are already exceeded in many GBWU's, with some research suggesting the threshold of ≤0.75km/km^2 is associated with sink habitats for wildlife populations.

Readers may remember that Alberta's first Grizzly Bear Recovery Plan (2008), modeled after Montana's approach, also set motorized access thresholds at a limit 0.6 km/km^2. But, that threshold applied to routes, not roads. That difference is crucial. The 2008 draft defines routes as: "Roads and trails that receive motorized use (*including seismic lines)*." (my emphasis) The 2008 definition included more than just roads. The 2008 draft further solidifies this interpretation of human motorized access by stating that: "lower open route densities should reduce rates of human bear interactions and ultimately reduce rates of human-cause mortality" (Alberta 2008). This alternative definition of route is much more indicative of the current access issue contributing to declining grizzly bear populations in Alberta, and could actually facilitate meaningful recovery strategies.

This debate about open roads versus open routes thresholds notwithstanding, neither Recovery Plan sets clear motorized access thresholds for grizzly bears that are legally enforceable or implemented. Thresholds, set through the law and enforced by officials, have been key to successfully recovering the species in Montana.

Erin Sexton, a biologist from the University of Montana, underlined the importance of legal obligations to species recovery in a *Desmog* news release earlier this year. She stated that the key difference between Canadian and American conservation strategies was that "when critical habitat is designated in the U.S., industrial activity is essentially off the table." Sexton claimed that no new roads have been built in the national forests of the transboundary Flathead area of Northern Montana, the area in which she works, for "decades" due to this legal protection of grizzly bear habitat.

While both Alberta and British Columbia seem to recognize that grizzly bear conservation hinges strongly on managing human motorized access, managers in the two provinces are implementing this concept into current recovery strategies in different ways and will likely depict their success or failure. If our network of roads continues to grow, large expanses of secure habitat for grizzly bears will become increasingly rare. We need conservation efforts with legal enforcement that allow a refuge for bears, places that are out of the reach of humans. If we can't make this an urgent priority now, eventually we will leave no other options for grizzly bears. No place will be a safe place.

Featured Artist Helen Jull

Crinoid fossil tile
PHOTO: © H. JULL

How Green is Alberta's Renewable Energy Development?

By Ian Urquhart, *Editor*

Is this a silly question? Does posing it suggest the Advocate's editor has his dates wrong? Recreational cannabis use isn't legal until October 17th.

Electricity Generation: The Importance of Renewables to Alberta's Ambitions

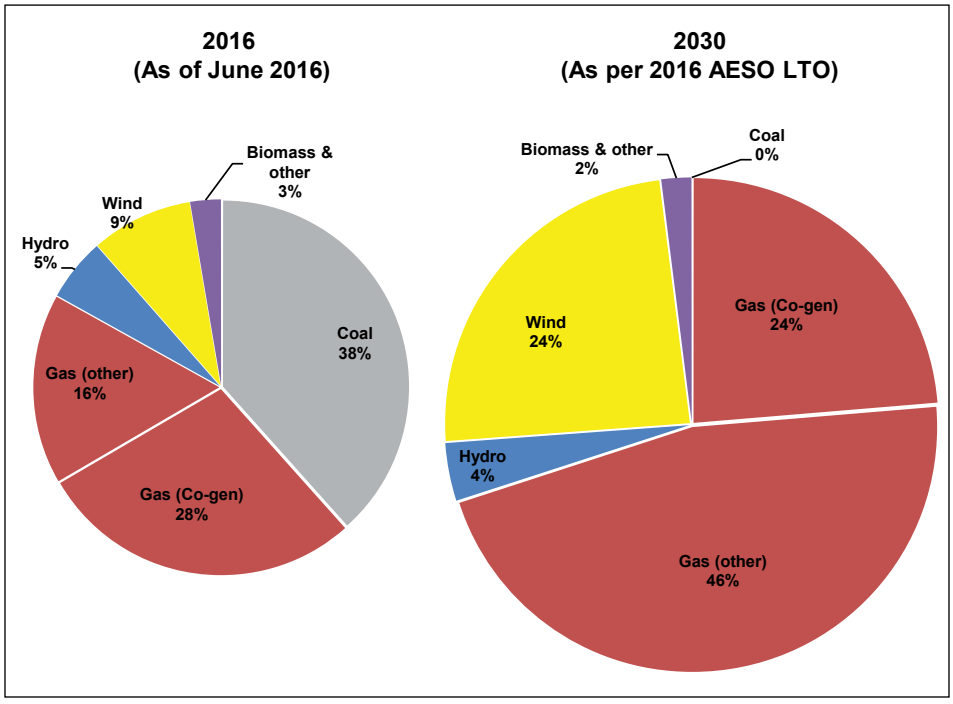
If you believe the question silly or, that I have my dates wrong, you likely will highlight Alberta's ambitious goal for increasing the percentage of electricity from renewables in the provincial grid. The Notley government's effort to address climate change sets a 30 percent target for 2030. By 2030, in other words, 30 percent of the installed electricity capacity in Alberta should come from renewable sources such as wind, solar, and hydro. The table below illustrates well just what a dramatic change this Renewable Electricity Program will contribute to. Coal-fired electricity plants, constituting 38 percent of the installed capacity in 2016, disappear altogether from the power grid. Wind power is projected to make up 24 percent of the electricity system's capacity in 2030, nearly triple its nine percent share in 2016. Natural gas-fired electricity also is expected to grow impressively over the next dozen years. It is projected to constitute 60 percent of the province's installed capacity in 2030, up from 44 percent in 2016. If this path is followed, 5,000 megawatts of electricity from renewables will be added to Alberta's electricity grid by 2030; renewables will constitute a significant portion of the province's electricity supply.

The ambitions of Alberta's Renewable Electricity Program certainly make the case that, when it comes to supplying electricity in the future, Premier Notley intends to green the grid. The program should help reduce Alberta's emissions from one of Alberta's most significant sources of greenhouse gases. If the sources of electricity are all we should consider when it comes to assessing ecological costs and benefits, then Alberta's renewable development efforts merit a "very green" badge.

It isn't that simple though. When it comes to embracing renewable energy we need to do so in ways that don't squeeze the life out of other important ecological values and objectives. Protected areas, ensuring that all of Alberta's natural regions are represented well and effectively in a provincial protected areas network, also need to be considered. The consideration is especially important given the significant positive contribution a healthy network of protected areas may make to preserving and restoring biodiversity.

The Renewable Energy Land Rush

Paying policy making attention to protected areas and biodiversity is especially important now because Alberta is in the midst of a renewable energy land rush.



The acronym "AESO LTO" refers to Alberta Electric System Operator Long Term Outlook.
Source: Government of Alberta, "Alberta Electricity System Overview," https://www.energy.alberta.ca/AU/electricity/AboutElec/Documents/Elec101.pdf. CREDIT: GOVERNMENT OF ALBERTA

Between 2016 and June 2018, the Alberta Utilities Commission (AUC) approved four utility-scale wind electricity projects. During that period, the AUC received another 14 wind farm applications. Together these 18 projects propose to produce more than 3,000 megawatts of electricity. Their turbines and associated infrastructure will spread out over nearly 1,350 square kilometres of the province.

The extra-large size of this footprint may be easier to picture if we compare it to the sizes of Alberta's municipalities. This wind farm footprint is more than ten times the size of Lethbridge, more than ten times the size of Red Deer. Two cities the size of Edmonton would fit snugly in this area. Once these applications cross the 1,650 square kilometer threshold an area twice the size of the city of Calgary will be targeted for utility-scale wind power projects.

This land rush, like other episodes of industrialization in Alberta's history, has the potential to put more negative pressure on lands whose broader ecological values were dismissed by past administrations. This is especially so because the vast majority of these projects intend to locate in Alberta's Parkland, Grassland, and Foothills Natural Regions. Table One shows just how poorly represented these regions are in Alberta's catalogue of protected areas. There has been very little, if any, positive change in their status since 2005. Grasslands constitute 14.5 percent of Alberta – yet only 1.3 percent of this natural region enjoys some measure of protection; the Parkland region makes up 9.2 percent of the province but only 0.9 percent of this region is protected; the Foothills stretch over 10.1 percent of Alberta – only 1.4 percent merits the label "protected."

Respecting and Realizing the Protected Areas/ Biodiversity Link

Elsewhere in this issue Joanna Skrajny and Grace Wark introduce you to Canada's commitment, under the United Nations Convention on Biological Diversity, to ensure that 17 percent of Canada is secured in a terrestrial protected network by 2020. In Alberta, as Table One indicates, 14.8 percent of the province is within that network. But, the fact that Alberta is within striking distance of the 17 percent goal shouldn't invite complacency. It shouldn't divert our attention from a vital condition attached to pursuing Canada's United Nations commitment. In meeting its 17 percent target, governments in Canada should ensure that additions to the terrestrial network "focus on areas that are ecologically representative and important for biodiversi-

Table One: Alberta Natural Regions, Size and Percentage Represented in Parks and Protected Areas, 2018/2005

Natural Region	Total Size (sq. km)	Total Size (% of Alberta)	2018 Size of Natural Region(s) Protected (sq. km)	2018 Percentage of Natural Region(s) Protected	2005 Percentage of Natural Region(s) Protected
Rocky Mtns	49,070	7.4	29,577	60.2	58.1
Foothills	66,436	10.1	944	1.4	1.4
Grassland	95,565	14.5	1,257	1.3	0.8
Parkland	60,747	9.2	570	0.9	0.9
Boreal Forest	378,046	57.3	58,384	15.4	13.2
Can. Shield	9,719	1.5	7,130	73.4	15.5
Total	659,583	100.0	97,863	14.8	12.5

SOURCE: GOVERNMENT OF ALBERTA.

ty and ecosystem services, and to ensure that these areas are well-connected and effectively managed."

The historical failure to adopt this focus or implement this condition in Alberta has influenced the geographical representation of species-at-risk in our province – one indicator of biodiversity. Forty-two species were listed as "at risk" by the Alberta government in 2015; twenty-six of those species are dependent on grasslands. Remembering that preserving biodiversity is the goal of the UN Convention it's imperative that efforts in Alberta to meet the 17 percent target prioritize the natural regions that are so poorly represented currently in the province's network of protected areas.

This combination – Canada's commitment to the UN Convention on Biodiversity plus the prevalence of species-at-risk on grasslands – should put a caveat on Alberta's renewable energy development ambitions. AWA believes that public lands should be excluded from consideration when it comes to locating any industrial/utility-scale renewable energy project. Furthermore, all such renewable energy projects should be subject to a thorough provincial environmental assessment; any project with a proposed capacity of greater than five megawatts should be designated as a mandatory activity in Schedule 1 of the *Environmental Assessment (Mandatory and Exempted Activities) Regulation*. Currently, there is no requirement to conduct an environmental assessment of these projects under Alberta's *Environmental Protection and Enhancement Act* (Sections 44 and 47 of that Act leave it to the discretion of the Director or the Minister to require an environmental assessment of a non-mandatory activity that is not exempted by regulation.).

In Germany, where wind generated 16.3 percent of the nation's power in 2017, environmental impact assessments are mandatory for wind energy projects with 20 or more turbines and conditional for projects involving three to 19 turbines (the conditionality depends on the results of an initial screening process). Mandatory assessments are particularly appropriate given the fact that Alberta, unlike Germany, has not conducted comprehensive "suitable area" or regional/local spatial development plans. Geissler, Köppel, and Gunther wrote in 2013: "These suitable areas are identified by a restriction analysis comparable to the following sequence: (1) mapping all categorical no-go areas (e.g. nature conservation areas, areas with high sensitivity of landscape scenery, forests, residential and industrial areas etc.) and buffer zones, (2) analysing wind potential of remaining sites, and (3) designating the remaining areas."

As someone who has studied both Alberta's pulp mill boom of the 1980s/90s and the more recent tar sands boom, I fear the current provincial government is repeating those histories of industrial development. In both histories, development surged ahead before basic knowledge about the ecological consequences of these types of industrialization was gathered. Today instead, Alberta's policies should be guided by basic knowledge about the ecological consequences of these types of industrialization. AWA believes its essential for government to fund research into and monitor the impacts of industrial/utility-scale renewable energy development.

The need to fund research is vital for several reasons. First, the research of Baerwald, Patterson, and Barclay on the wind turbine mortalities of bats in southern Alberta published in *Ecosphere* in 2014 warns that "fatalities at a single wind energy site have the potential to have far-reaching ecological and population consequences." Policy makers should invest the funds needed to see how serious this potential could be. Second, species such as bats provide important ecological services to economic sectors such as agriculture. Boyles et al estimated in their 2011 article in *Science* that bats, by eating insect pests, likely provided $22.9 billion in ecological services to U.S. agriculture. Those benefits didn't include secondary effects of predation such as reducing the potential for insects to evolve and increase their resistance to pesticides. Nor did it include the similar pest-reduction services bats provide to the forest products sector.

AWA's position contrasts with some who are recommending that public lands should be set aside as sites for utility-scale renewable energy electricity projects. Professor Ingleson, in a recent post on the University of Calgary's ABLawg website (ablawg.ca), urged the provincial government to lease public lands to wind power developers; in his view, the failure to do so "was an obstacle to additional wind farm development in the province." The figures cited earlier suggest that wind farm development is proceeding rapidly despite the absence of an official policy devoting public lands to this type of industrialization.

Since much of the current land rush is taking place on privately-owned lands and those lands are important to biodiversity and species at risk AWA also expects government to adopt certain regulatory positions. For example, if industrial/utility-scale renewable energy projects destroy or disturb native grassland, foothills, or parkland on private lands, the project's owners must restore the native habitat.

As Dr. Joseph Kiesecker, lead scientist for The Nature Conservancy's Conservation Lands Team, stated, a renewable energy plan that doesn't address the "energy sprawl" associated with wind farms isn't necessarily a green one. AWA agrees. If this provincial government wants a build a healthy green energy legacy it must do so in a way ensuring renewable energy development respects other ecological values.

The Slow-Food of Wilderness Adventure:

Canoeing the Red Deer River From Dry Island Buffalo Jump to Dinosaur Provincial Park

By Andrea Johancsik

When the chance to paddle the Red Deer River in sections from Dry Island Buffalo Jump to Dinosaur Provincial Park came up, completing a 174km section of one of southern Alberta's most undeveloped river valley landscapes, I readily agreed. From May to July, my friends and I completed the route in three sections.

You may have scrambled around the unique formations of the Canadian badlands and think you've seen it all, but the river valley is such a uniquely beautiful way to witness this rugged and biodiverse ecoregion. Think of it as the slow-food movement of wilderness adventure. The meanders of the Red Deer force you to exercise patience and your senses are only occupied by the occasional chorus of crickets or chirps of eastern kingbirds; the hot sun is indifferent to the sweat dripping down your back and the soft dip of your paddle echoes in the steep valley walls. But suddenly, drama interrupts this tranquility. A belted kingfisher may hover dramatically over the river like an oversized hummingbird, before diving into the water, scooping up a fish in its large bill. Or, a surprised coyote the same colour as the sandstone glances back at you before it saunters off into the willows. Maybe your trip will be made by a golden eagle, suddenly taking flight before it soars to catch a thermal and spirals overhead. You could even see a crayfish darting back to safety under the mud as you paddle gently by.

Eagles, while seemingly rare to spot everywhere else, are the most common large animal you'll see. Beaver, mule deer, and cattle (this is agricultural country, of course) also will watch your progress. My group saw so many eagles on our weekend between Drumheller and Emerson Bridge that in seven hours we counted 17 bald and golden eagles!

History buffs and palaeontology enthusiasts, like wildlife enthusiasts, can expect to be equally excited by the prospect of finding treasures on the Dinosaur Trail. On a quick snack break on the northwest side of Drumheller, my palaeontologist friend found a complete ceratopsian foot bone lying on the riverbank (the ceratopsians were herbivorous, horned dinosaurs that lived during the Cretaceous period – 145 to 66 million years ago). I went over a hillside to use the "facili-trees" and discovered the ground was littered with petrified wood and fossil fragments. Near East Coulee, abandoned stores and homes reminded us of a coal era long gone. A burnt, broken bridge with a cross on top felt so spooky we quickly paddled onwards.

Long moments of peace came between these encounters with history and wildlife. I quickly found myself becoming comfort-

A golden eagle surveys the river valley
PHOTO: © A. JOHANCSIK

Approaching Drumheller and Its Welcoming Committee
PHOTO: © A. JOHANCSIK

able in the easy company of close friends; I felt my creative brain exercise; ...I became increasingly silly! I began introducing beaver lodges as if they were for sale in real estate ads. "A perfect home for a growing family," or "comes complete with a 'green' roof... just don't mind the muskrat taking residence in the living room..." And then there was the one with "a unique architectural design." After all, exercising our brains was the only thing to keep us busy in a world with no cell service to distract us or help answer the many questions we had. "Why is that culvert there?" "What river animals are making the mud billow like that?" "Why is there a ferry when they could just build a bridge?" "How many eagles did we not see?" We invented reasonable theories to answer most of the questions, but I think the time spent wondering matters more.

I would recommend a Red Deer River paddle to people of all ages and abilities. Providing you've checked water levels and advisories, the paddle is not technical and the routes are adaptable.

Andrea's Pro Tips for Packing for a Red Deer River Paddle

- **Do plan** for weather; what I've made sound like a pleasant trip could turn nightmarish if conditions are different. Expect exposure. Do bring an umbrella for rain, but especially for sun protection! Be cautious if there is thunder in the forecast; shelter is rare.
- **Do check Alberta Rivers** - it's a free app (available for iOS from the Apple App Store or from Google Play at https://play.google.com/store/apps) where you can check flow conditions and other advisories.
- **Do practice low-impact camping** by observing fire bans, camping where legal below the high-water mark, and packing out all waste including toilet paper.
- **Don't expect much cell service** except around Drumheller, but **do bring a rechargeable battery** for your phone and download an offline map before you go.
- **Do bring enough water** – fill coolers with frozen water bottles, which you can drink as they thaw. 4L milk containers work well too. Expect to drink twice as much water as you normally would and bring electrolytes to keep yourself hydrated. I always pack a filter and purifying tablets too.
- **Do wear clothing to cover up** like long pants, long sleeves, a wide-brimmed hat and sunglasses – you will get burned, even if you put on sunscreen! Covering up also helps against any bugs.
- **Don't forget safety equipment required by provincial laws** including an extra paddle, 1L bailing device, and personal flotation devices.
- **Don't be shy to bring a lot** as canoes and kayaks can hold a lot of gear! **Do pack your gear in dry bags or garbage bags.**

Paddling Near Tolman Bridge PHOTO: © A. JOHANCSIK

Louise Guy Poetry Corner

In this issue we are pleased to republish David Mayne Reid's poem "Late Fall Sandy Point" and Betty Milham's poem "Wild Synergy." These poems were featured in the 2014 Louise Guy poetry competition.

LATE FALL SANDY POINT

Breathless after the hot climb.
Nearing the edge of the river-cut gorge.
I flop onto a level patch of sun warmed prairie grass
in a glade of miniature aspen.
Leaves trembling with imperceptibly felt warm wafts of air.

Yellow orange hues everywhere,
readying for winter.
Nutrients flowing from tired leaves
to support fresh young roots.
Plump ground squirrels prepare winter quarters.

I rummage in my pack.
Spread out my succulent orange,
fat left-over breakfast bratwurst,
a Big Rock cooled in a damp t-shirt.
Mouth waters in anticipation.
Stomach utters a pleased tiny murmur.

As I reach for the juicy sausage
a movement
just below.
A stag proudly bearing a regal eight point rack.
Pauses,
peers intently towards me.
We can see the whites of each other's eyes.
His damp nostrils flare.
Neither stage or human moves.
I slow my breathing.

A brief eternity,
silently,
slowly,
passes.
Satisfied I am no threat,
he bows, nibbles a twig,
then gracefully
vanishes behind a golden grove.

My lunch forgotten,
but I am at peace.

WILD SYNERGY

Nature spoke, she heard.

Swishing skis, buzz of bees, whispering trees.
Rumbling, tumbling streams,
Warning howls in wind at mountain tops,
mouse squeak snow.

She walked on moss,
balanced on rock,
fingered pussy toes.
Mist tickled her face to a smile.

She knew the furry tongue of thirst,
Muscles' heat and
earths' blood pulsing life support.

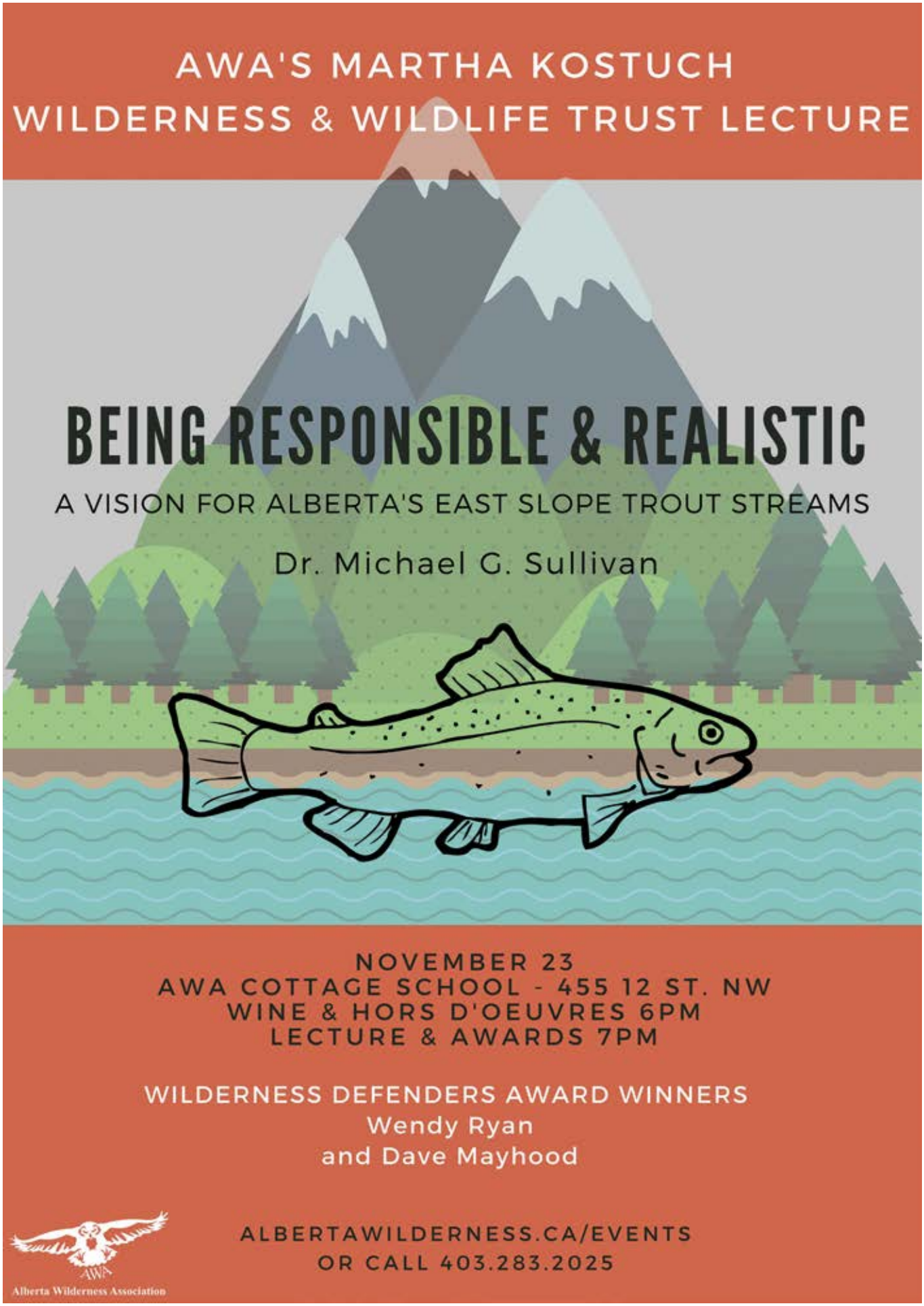
She savored the taste of wild
strawberry, sage memories,
ice water, salt on lips.
She quenched her thirst.

Her sight to see
the lift of eagle's wings.
Her heart lifted too.

In eventide's tinkled stars,
the dance of northern lights
the flush of alpine glow
a silent stillness that contains all.

Wild places where
time recedes, eagles ride,
rivers talk,
hearts lift.

Nature speaks. Listen. Know.

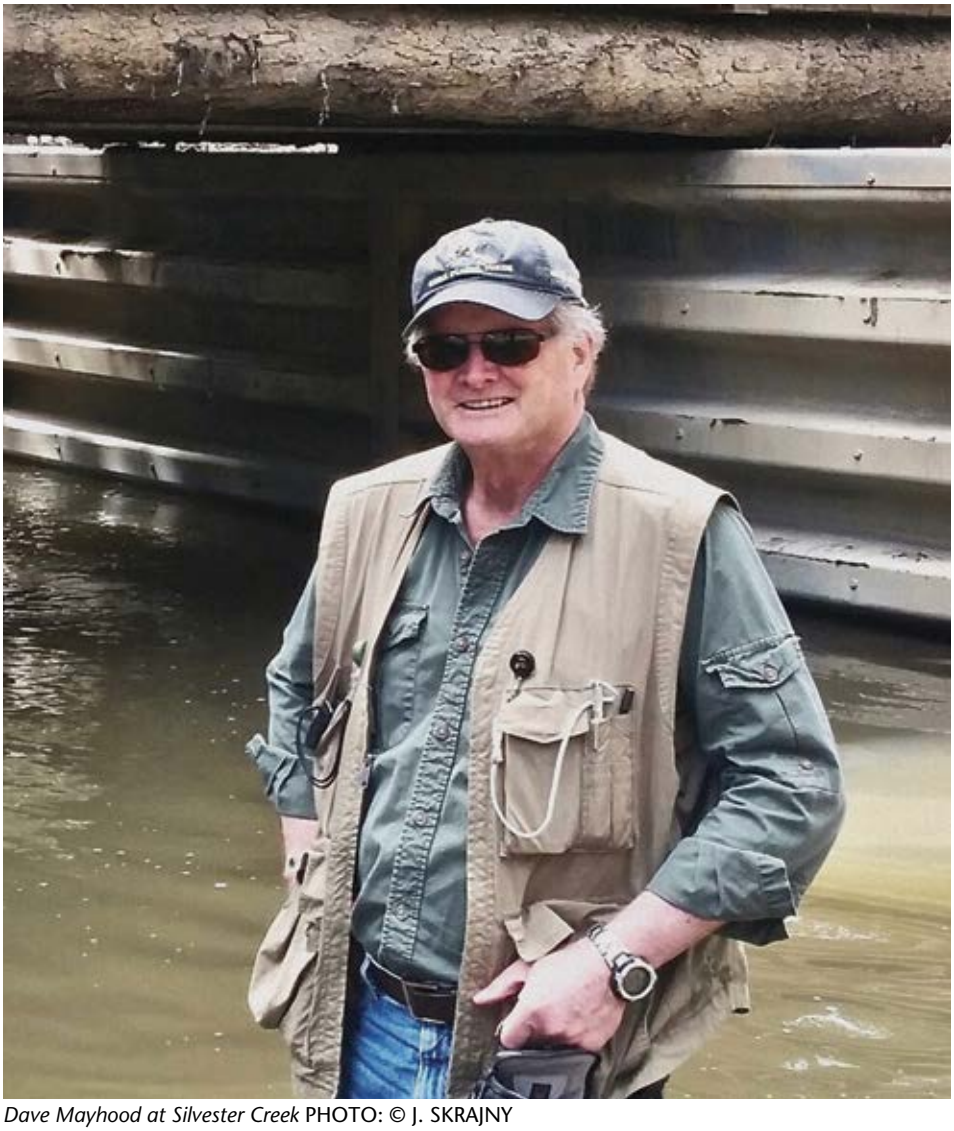

AWA'S MARTHA KOSTUCH
WILDERNESS & WILDLIFE TRUST LECTURE
BEING RESPONSIBLE & REALISTIC
A VISION FOR ALBERTA'S EAST SLOPE TROUT STREAMS
Dr. Michael G. Sullivan
NOVEMBER 23
AWA COTTAGE SCHOOL - 455 12 ST. NW
WINE & HORS D'OEUVRES 6PM
LECTURE & AWARDS 7PM
WILDERNESS DEFENDERS AWARD WINNERS
Wendy Ryan
and Dave Mayhood
ALBERTAWILDERNESS.CA/EVENTS
OR CALL 403.283.2025
AWA
Alberta Wilderness Association

From Rotifers to Westslope Cutthroat Trout:

Honouring a Social Contract

By Ian Urquhart

Dave Mayhood's trajectory in life was confirmed on a cold Christmas day in Regina in the 1950s. On Christmas morning the microscope Dave had asked for was under the Mayhood Christmas tree. Earlier that year when the book mobile that served as his school's library had made its regular stop Dave borrowed the book *Fun With Your Microscope* by Raymond Yates. The book was full of all sorts of fascinating projects and, with his Christmas wish granted, he started to explore the world his microscope invited him to enter. He tore up old grass, mixed it with snow water, and let it ferment. Rotifers, protozoa of various kinds such as paramecia all starred on the stage Dave's microscope provided. "I knew from about that age, nine or ten," he said, "that I'd like to work as a biologist." He was so set on that vocation that he fudged his answers on school aptitude tests to ensure he would fit the outdoor profile he associated with being a biologist.



Dave Mayhood at Silvester Creek PHOTO: © J. SKRAJNY

Organizations like AWA and Timberwolf Wilderness Society are very grateful to Dave for making that occupational choice (and to his parents for that generous Christmas gift – microscopes didn't have to be of the electron variety to be very dear in the 1950s). Whether as an Honors or Master's student at the University of Calgary or as the President and chief aquatic ecologist of Freshwater Research Limited Dave has dedicated himself to the high quality scientific research that helped to make him one of this year's AWA Wilderness Defenders. Our province would be a better place if the populations of native trout species such as westslope cutthroat were as healthy as Dave's publication record on those and other aquatic subjects.

Before we got together for coffee Dave had mentioned how instrumental he felt the Alberta public education system had been in his life. When asked to elaborate Dave outlined the sense of obligation he has felt towards his fellow Albertans for the high quality, then-affordable, university education he benefited from in the 1970s. Then summer jobs were more often than not full-time jobs; a month's pay, maybe less than that, paid for a year of tuition. Today's norm for university students – working part-time on top of taking out student loans in order to go to school – was much rarer then.

Listening to Dave talk about his perspective on what university offered him and what

Baker Lake, one of Dave's favourite lakes in the Canadian Rockies PHOTO: © D. MAYHOOD

he thinks he owes society was to listen to someone talk about a social contract – the idea that for a society to function well there needs to be an understanding between people about what their obligations and rights are relative to each other. If a high-quality, affordable university education was one side of the bargain, Dave's saw his side as one asking him to give back to the community. The pro bono research and other activities he has done over the years testifies to the idea's importance to Dave.

Dave's summer jobs during those university years deepened his appreciation for wild spaces. He worked in the limnology section of the Canadian Wildlife Service and was seconded to Parks Canada; there didn't seem to be an aspect of the science of freshwater that he wasn't exposed to during those summers. This work took him throughout western Canada, to prairie National Parks such as Prince Albert and Riding Mountain, and outside the prairies to the world-renowned experimental lakes set aside for freshwater research in northwestern Ontario.

His Master's work also nurtured that appreciation of the wilder parts of our natural world. His thesis was very ambitious and focused on the secondary production of six mountain lakes at different elevations in the vicinity of Lake Louise. During that research they worked very hard but they did so "in some of the most beautiful country in the world and we got special privileges to work there." Any sane person who heard Dave describe Baker Lake, one of the alpine lakes he studied, would have to add it to their list of "must see" places in the Rockies.

When Dave finished university the era of government public service cutbacks had started in earnest. Public service biologist jobs were scarce. Dave smiles when he says that, with hindsight, that was probably a good thing. As a government employee he had sometimes landed in a bit of hot water because "I would just say what I thought and I wasn't too circumspect about the way I thought things should be run." After he finished his Master's he turned to the world of contracts and consulting instead of the public service. This work again took him throughout the West, to the Stikine in B.C. and to the tar sands mining area in northeastern Alberta.

Certainly some of this work fueled his inclinations to defend wilderness and wildlife. Given Dave's predispositions it was impossible to do anything else when companies tried to explain away significant declines in fish populations that their activities likely caused or contributed to. It was maddening to hear him describe situations where, in the face of a population crash, a company would turn its back on baseline data and the methods used to gather that data. Instead of asking "why did this population crash" they instead claimed they couldn't conclude anything if the traps used to measure populations today were only catching a sliver of what they caught years ago.

One of the most notable and satisfying moments in Dave's career came through a very

big project he did for Jasper National Park. The Park wanted to develop a fish management plan that stressed conservation rather than sport fishing. This suited Dave perfectly. The opportunity arose at the time when conservation biology was a novel, but rapidly developing, field of biology. Ironically perhaps, the plan never got beyond the draft stage because the conservation orientation was too controversial. But regardless, the Park's "overall focus changed from producing fish for fishermen…including a lot of introduced species to protecting and conserving what was left of the native fish." In the end, Dave concluded, Jasper did the right things from the conservation perspective, an approach subsequently picked up by Banff National Park.

In recent years AWA, and other organizations, have benefited importantly from Dave's work on westslope cutthroat trout. Dave was the first person to prepare a conservation assessment of Alberta's westslope cutthroat trout population. That work from 1999 has remained an accurate account of the general state of the population, that "they have been obliterated from most of the streams and likely there were only a very few populations of the pure form left." His conference paper helped stimulate a realization among angling-oriented conservation organizations of the dire straits this native trout was in and of the need to strengthen protection and restoration initiatives.

Today, Dave's encouraged by the infusion of cash Alberta Environment and Parks received to support westslope cutthroat work and the ambitious, enthusiastic outlook of the young cohort of biologists who are tasked with strengthening the place of this native trout in our streams. If that cohort receives the support they need, then the future of westslope cutthroats may be brighter.

Dave is less charitable when it comes to the federal government and its neglect of what he believes are its clear constitutional/legal duties. An action plan to recover the Alberta population of westslope cutthroat trout, required by the federal *Species at Risk Act,* was due more than three years ago. Information received through access to information requests from AWA and Timberwolf Wilderness Society make it clear that the federal Department of Fisheries and Oceans has identified critical habitat that must be spared from industrial activity. Rather than use that knowledge to fulfill the legal obligations under SARA the federal department appears to prefer to force ENGOs to take them to court to see the law obeyed.

We ended our conversation by talking about the role of science and scientists in policy making. Dave's Wilderness Defender plaque will contain, in part, this statement: "Scientists have an explicit obligation to fight for what they have shown to be true." I asked him why he felt that way. Dave's answer revealed he's certainly not naïve about the relationship between science and politics. Political decision-making often is about making compromises between different interests; it has been, and perhaps always should be, about more than just science and scientific research. But, the public should know the extent to which those compromises respect and incorporate accurate scientific information bearing on the decision. This is why scientists must speak out.

For the sake of Alberta's westslope cutthroat, a native trout species Dave knows so very well, I hope scientists heed his advice and that their studies will be used to carve out some desperately-needed space on Alberta's landscapes for this and other species at risk. I, for one, would like the cohort of biology students entering university today to have the opportunity to study the westslope cutthroat's recovery rather than its extirpation.

Featured Artist Helen Jull

Plesiosaur fossil tile
PHOTO: © H. JULL

Dill Flowers
PHOTO: © H. JULL

Great Gray Owl Awards – 2018

By Jim Campbell, *AWA 1st Vice-President*

This year's Great Gray Owl Awards recognize a remarkable duo who have contributed so much to the liveliness of a multitude of Alberta Wilderness Association events. Murray Little and George Campbell have provided the music at the Climb for Wilderness and at many fine evenings of Music for the Wild at the AWA offices. They are passionate about their music and their commitment to conservation – a powerful combination indeed.

Murray Little

Murray Little grew up in Saskatchewan as a "town boy" in Saskatoon with many memories of great fishing trips in Northern Saskatchewan with his father. After high school, Murray enrolled at the University of Saskatchewan in Chemical Engineering and after graduation migrated west, like thousands of other prairie people, to the allure of the oil and gas industry in Alberta.

After a successful career, riding booms and surviving busts, he launched himself as an independent consultant. That new career lasted for more than twenty years. His decades of success were based not only on his competence but also on his character. He never hesitated to "fire a client" if their values transgressed his thus maintaining his reputation for quality work done with great integrity.

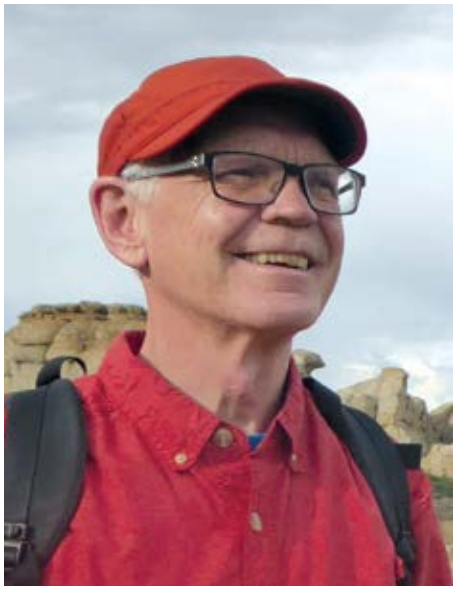
Murray's second career has been in the Calgary music scene. Not only does he play mandolin, guitar, and bass but he has led the Foothills Acoustic Music Institute (FAMI). Since 2000 the Institute has operated an annual camp for 150 musicians at Camp Kiwanis west of Calgary where they hone their skills, create impromptu bands, and develop long-lasting friendships. The rent the musicians pay to Camp Kiwanis is used to create "camperships" for disadvantaged young people to enjoy a summer camp experience thereby creating even more good will and good memories in the community. More recently, Murray has launched the "Little Concerts" series at Fort Calgary to give local musicians a platform to become known across the City. He also provides concerts at Wellspring Calgary for people coping with cancer. Just to show that "old dogs can learn new tricks" he has created websites for 32 musicians, an essential tool for any performer working to build a public profile today.

Murray's involvement with Alberta Wilderness Association over the past seven years stems from the friendship he struck up with George Campbell at the FAMI music camp. Murray felt an immediate affinity for the work of AWA from his boyhood in Saskatchewan and many family camping trips with his wife, Diane, and their two now adult daughters. He has always been drawn to the outdoors and has a special attraction to places with bodies of water be they rivers, lakes or ponds.

A love of wilderness and a career in oil and gas resource development has not been without its contradictions and conflicts. A wonderful memory for Murray is his interactions with the legendary Martha Kostuch during his career when she was representing the ENGO sector while he was representing the energy sector and its needs for infrastructure. From that experience he learned the importance of mutual respect and the need to see the situation from the eyes of the "other."

Through the work of AWA and other like-mandated organizations Murray sees a growing awareness of the impact of human presence coupled with an understanding of the limited nature of natural resources. Looking to the future Murray sees that to build on this growing awareness there is a compelling need to teach environmental ethics to people of all ages so that everyone will all act in a way that makes us "tread lightly on the land."

George Campbell



George Campbell was raised in Amherst, Nova Scotia and attended Acadia University in Wolfville before migrating westward first to Edmonton and then to Calgary to work for Dome Petroleum in the heady days of yet another oil and gas "boom." His work with Dome took him to their exploration work in the Beaufort Sea in Canada's Arctic reaches; while those efforts ultimately came to naught they nevertheless left an indelible impression on all who experienced the vastness of the Arctic and its remarkable, challenging environment. George became as an independent consultant to industry in 1986 and it is a testament to his competence and character that he has been steadily employed – as much as he wants to be – ever since.

George is certainly no exception to what I see as a rule – music is deeply embedded in the DNA of Maritime folk. George was the founder and first President of the Foothills Acoustic Music Institute (FAMI) where he met his fellow Great Gray Owl recipient, Murray Little. A decade ago he created "Music for the Wild" to generate interest in the AWA and to provide a stage for local musicians to perform and become better known. These events have provided a great synergy for two fine purposes. Since Music for the Wild began he has arranged 38 concerts at AWA's Hillhurst Cottage School; each concert offers an opportunity for two distinct groups to perform. It is a measure of the concerts appeal that they are virtually all "Sold Out" well in advance. In addition, George plays guitar himself at many AWA events including the annual Climb for Wilderness.

It is not surprising that that George's first introduction and attraction to the AWA was though his wife, Carolyn Campbell, one of AWA's highly regarded Conservation Specialists. Beyond that obvious connection George continues to be drawn to the AWA by the contribution he can make through "Music for the Wild" and the people who patronize the events.

Over his time with AWA George has come to more fully realize the vital role the ENGO sector plays in the environmental world. George believes any environmental protection system, as challenged as it is to be relevant, would collapse entirely without the commitment of the full spectrum of ENGOs. He cites the wonderful example of Dorothy Dickson who conducts tours of the Rumsey Block, a unique unsullied area of Alberta's Parkland. Dorothy's personal knowledge of the area and commitment to conservation makes such an enormous difference. From a business perspective, George continues to be impressed by the leveraging ENGOs use to have big impact with remarkable small budgets. With regards to AWA, George says AWA is "expert" at engaging and supporting volunteers as a natural part of their way of working and this vastly improves the organization's impact as a result.

George sees the biggest challenge facing the conservation movement as our proclivity to "love a place to death." Fragile wilderness places are particularly susceptible to this because, once damaged beyond a certain point, wilderness may not recover. The physical distance of wilderness from the day to day lives of most people means it is often not a part of most people's thinking. So for George the importance of good "stewards" who educate people about the importance of wilderness cannot be overstated. His hope for the future rests on the large numbers of people who are willing to take on this role in any number of ways. This group includes many corporate leaders George has met who are driven not just by the search of profits but also by supporting long term views and policies aimed at a healthy world for all.

Notice to Members

Annual General Meeting of Alberta Wilderness Assn

Nov. 24, 2018

10 am

AWA Hillhurst Cottage School
455 - 12 St NW, Calgary

Featured Artist Helen Jull

Yellow Feather Vase PHOTO: © H. JULL

Leaves (a random drop of glaze added a blue beetle) PHOTO: © H. JULL

Updates

National Parks, Nakiska, and Calgary's Potential Bid for the 2026 Winter Olympics

Should Calgary bid to host the 2026 Olympic and Paralympic Winter Games? This question is being debated and will be the focus of a plebiscite in Calgary on November 13, 2018. Then Calgarians will have the opportunity to answer this question: "Are you for or are you against Calgary hosting the 2026 Olympic and Paralympic Winter Games?" Depending in part on how Calgarians respond in November, the City will decide whether or not to submit a bid to the International Olympic Committee in January 2019.

In the second week of September, Calgary 2026 – the corporation established to explore and develop the potential – submitted its Draft Hosting Concept Plan Concept to Calgary City Council. Alberta Wilderness Association was pleased to see that this plan does not propose to locate any Olympic or Paralympic venues in Banff National Park. In April 2018, AWA wrote to Mayor Nenshi, Premier Notley, and Environment and Climate Change Minister McKenna asking them to insist that "any Olympic bid exploration by Calgary must recognize National Parks are not a suitable venue." Calgary 2026 proposed Nakiska as the venue for the alpine, snowboard cross, and ski cross events; Canmore is the proposed venue for the cross-country and biathlon events.

AWA's view now, as it was for prior Winter Olympics proposals, is that Olympic and Paralympic events will further threaten and compromise Banff National Park's ecological integrity. In 2016 Parks Canada assessed Banff's ecological integrity as only "Fair." Although the Park's ecological integrity hadn't declined it also hadn't improved. The days of more development and growth in Banff should be over if Parks Canada is committed genuinely to respecting the 2010 Banff Management Plan mandate to give "first priority to maintenance or restoration of ecological integrity."

If Calgary presses ahead in 2019 with a bid to the International Olympic Committee AWA intends to keep a close eye on how that bid evolves. Our institutional memory remembers well the efforts to shift alpine events to Lake Louise in 1988 despite the original bid's selection of Mount Allan, the site of the Nakiska ski resort, for those competitions. Any effort to shift Olympic or Paralympic events will redouble AWA's opposition. If a bid for the 2026 games is made you also can expect AWA to press organizers to ensure that any upgrading of infrastructure for the alpine events at Nakiska remains within the current footprint of the resort.

- Ian Urquhart

Caribou Range Decisions Approaching

Woodland caribou in Alberta are in real trouble. But, the next few months could produce a crucial, positive turning point. In late April and early May (as reported in the last *Wild Lands Advocate*), Environment and Climate Change Canada (ECCC) issued several important findings under the federal *Species at Risk Act* (SARA). The findings cover both types of Alberta's woodland caribou. For *boreal* woodland caribou, ECCC concluded that Alberta's existing laws do not protect critical habitat. For *mountain* woodland caribou, which migrate between summer alpine and winter foothills ranges in both Alberta and B.C., ECCC Minister McKenna declared in a separate report that there was an imminent threat to their recovery.

The two findings oblige the ECCC Minister under SARA to recommend to the federal cabinet that it issue a safety net order to protect that crucial habitat. Federal officials have indicated that one path provinces could take to avoid a protection order is to negotiate conservation agreements that commit to timely, effective protection of habitat. With the next federal progress report on boreal caribou recovery due in late October, Alberta must demonstrate and commit to protecting caribou habitat to promote self-sustaining populations.

AWA believes the ongoing habitat destruction associated with years and years of ineffectual 'talk and log/drill' discussions must end. We believe an interim federal habitat protection order in one or several ranges is needed to spur the completion of Alberta range plans. The order could last for several weeks or months, and be removed once a binding range plan is in place.

AWA and other ENGO colleagues have met with federal and provincial officials to urge *interim* protection measures and swift completion of enforceable range plans. We have provided concrete suggestions for solutions that optimize economic activity in caribou ranges, consistent with the minimum 65 percent undisturbed habitat threshold caribou need to survive and recover. For example, energy surface footprint can be clustered in corridors using longer distance directional drilling, tenure extensions, reversions and pooling, and shared infrastructure are all options that facilitate, not shutter, industrial activity on the land. Unsustainable forestry surge cuts must end and regional timber allocations can be shared and optimized to protect jobs. Caribou habitat restoration can provide both an economic stimulus to communities and environmental benefits to forests. The energy industry can fund reclamation of legacy seismic lines, redundant roads, and abandoned oil and gas wells. Pipeline and transmission line operators can narrow today's wide corridors.

To underscore this point, a new report commissioned by AWA, David Suzuki Foundation and Harmony Foundation, authored by expert economic consultants, has

found that caribou conservation and continuation of existing economic activities are *not* mutually exclusive for the Bistcho and Yates ranges in northwest Alberta. The Caribou4ever.ca website will have all the details, including a shareable fact sheet. Please use the quick letter template on that website to let the Premier know why saving caribou and their habitat is important to you, and encourage your conservation-minded friends to do the same. Citizens' voices are really needed now; this is a decisive time for our caribou.

For decades, Alberta governments have allowed too much industrial disturbance to destroy and fragment the older forests and wetlands caribou need to reduce their contact with predators. Our federal and provincial elected decision makers can now choose to embrace a restoration economy – an economy where optimal solutions are identified to provide forest-based jobs while maintaining and restoring the habitat our caribou need.

- Carolyn Campbell

Fall 2018: A Good Time to be a Greater Yellowstone Grizzly Bear

In late September Judge Dana Christensen gave the Greater Yellowstone grizzly bear population some very welcome news. The United States District Court judge ruled the United States Fish and Wildlife Service (USFWS) exceeded its legal authority in 2017 when it delisted the Greater Yellowstone grizzly bear from the U.S. *Endangered Species Act* (ESA). Judge Christensen restored this grizzly bear population's ESA status. The decision quashed the plans of the states of Wyoming and Idaho to re-introduce limited hunts this fall for this iconic species, hunts those states haven't allowed since 1974 and 1946 respectively.

The judge concluded that delisting these bears could not stand for two reasons. First, the USFWS failed to consider what impact delisting Greater Yellowstone grizzlies would have on grizzly populations in five other ecosystems in the Lower 48 states. Second, the USFWS "arbitrarily and capriciously" applied the ESA's threat analysis in this case.

Judge Christensen's comments on how federal Fish and Wildlife officials applied the threat analysis struck me as scathing. When it came to how the grizzly bear population would be estimated in the future the judge concluded that, in dropping a key USFWS commitment to recalibrating population estimate models, "the Service illegally negotiated away its obligation to apply the best available science in order to reach an accommodation with the states of Wyoming, Idaho, and Montana." He also criticized how the USFWS used two studies to support its claim that delisting wouldn't threaten the genetic health of the Greater Yellowstone bears. The Service's use was "illogical, as both studies conclude that the long-term health of the Greater Yellowstone grizzly depends on the introduction of new genetic material."

Reading this decision is enlightening for a variety of reasons. Most obviously, it underlines how our cousins south of the 49th parallel often face very similar conservation challenges to the ones we do. For those who are unfamiliar with the extent of the grizzly's decline in North America, it details well the history of the grizzly's precipitous decline in the Lower 48 states. In considering those who challenged the USFWS decision, the case also illustrates the common ground that should be looked for between First Nations and ENGOs. The decision is also striking for what it insinuates about politics and science. Western states had put considerable political pressure on the Fish and Wildlife Service to delist the Greater Yellowstone grizzlies. That political pressure, in Judge Christensen's view, improperly influenced how the USFWS considered and weighed the scientific information bearing on the delisting issue.

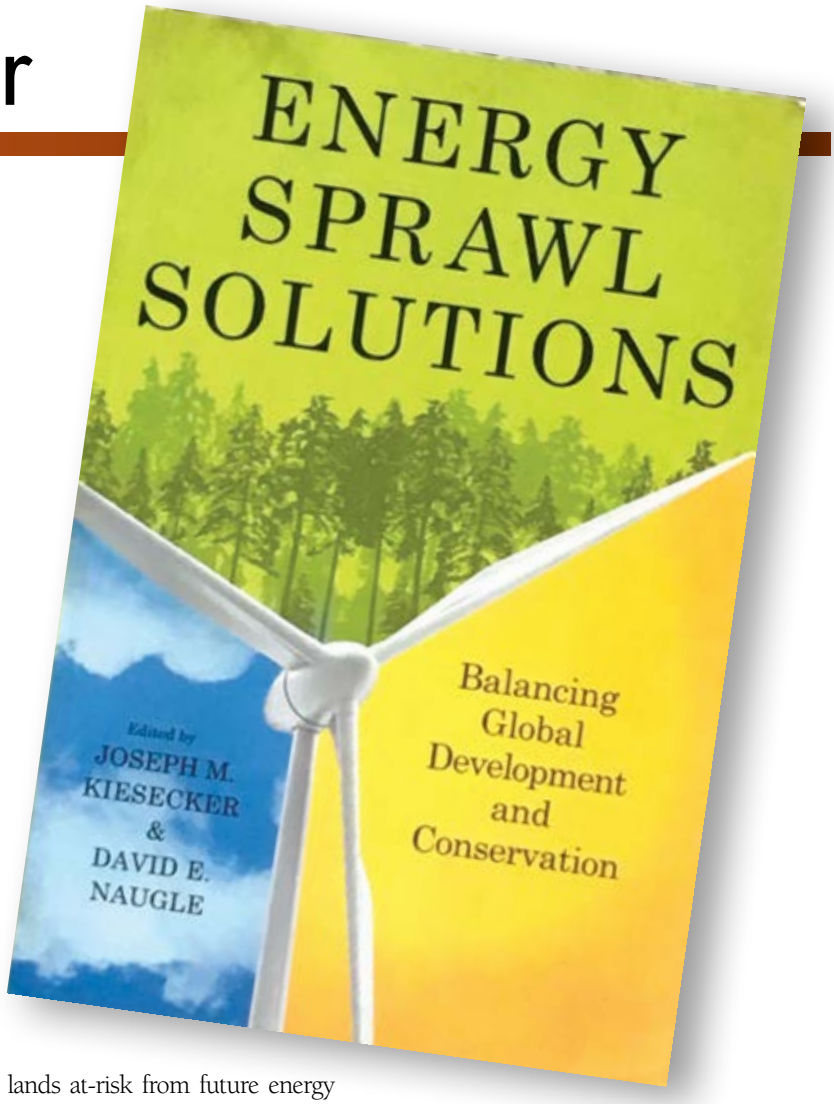
I also wondered if one aspect of this case wasn't quite analogous to a damaging change Alberta has proposed in its 2016 draft of a new Grizzly Bear Recovery Plan. This is the proposed change to "open road" density thresholds from the "open route" density thresholds that were established in the 2008 Grizzly Bear Recovery Plan. We described this change in a letter to Minister Shannon Phillips as "incredibly concerning." AWA believes the scientific evidence clearly shows this shift will not assist recovery efforts. The shift defines out of existence the linear disturbances associated with open routes (such as seismic lines), disturbances the scientific literature clearly links to the risk of mortality.

The analogy in Judge Christensen's decision is the choice the USFWS made, under the political pressure from the states, about how to estimate grizzly bear populations for the purposes of the ESA. The issue was "recalibration" – a mechanism where officials would bring population estimates from a new model into line with those of the model used to set the Final Rule. Recalibration was intended to be based on the "best available science" in order to maintain a strong level of protection for grizzly bears. In order to strike a deal with the states, the USFWS abandoned recalibration and the commitment to the best available science. "Rather than maintain heightened protections in the face of a recognized threat to the health of the Greater Yellowstone grizzly," the judge wrote, "the Service accepted a 'compromise' that was in effect a capitulation."

In the cases of both the USFWS recalibration/population estimator model choice and the Alberta "open routes to open roads" choice government officials preferred options that posed greater threats to the health of grizzly bears. The vital difference between the cases is that legal action in the U.S. under the ESA was available to American tribes and ENGOs. They took advantage and Judge Christensen agreed with them that the USFWS failure to include a recalibration provision in a conservation strategy was "arbitrary and capricious." No such legal recourse is available to defend those Alberta grizzlies that will face continued or increased mortality risks if the open roads threshold is adopted by the provincial government.

- Ian Urquhart

Reader's Corner



Joseph M. Kiesecker and David E. Naugle (ed.), Energy Sprawl Solutions: *Balancing Global Development and Conservation,*

(Washington: Island Press, 2017).

Reviewed by Ian Urquhart

This book is an important addition to the literatures on biodiversity and energy. It adds to those literatures by marrying them. Through the conservation concept of "development by design" the authors in this edited collection investigate how we can meet two pressing needs – increasing energy production and protecting biodiversity.

Peter Kareiva's foreword reminds us of the one ongoing global imperative that inspired this collection of 11 chapters – the need to deliver electricity to the over one billion people who don't have access to it today in ways that contribute to the climate change campaign and protect habitat and wildlife. The premise of development by design is that we use our knowledge to identify open zones for energy development as well as areas where energy projects will be prohibited in order to enhance biodiversity.

The focus of the collection is multinational. Part One of the book makes the case for why this is a challenging global imperative. Part Two presents seven case studies that speak to the need to reduce energy sprawl while supplying future energy demands. Part Three tackles the vexing problem of how we make best practices, common practices.

The enormity of the challenge is underlined early in Part One. The first chapter examines the geographical distribution of risks to natural lands from increased energy production. Its mapping of cumulative development threats and natural lands at risk provides a very good overview of why and where planning to mitigate the effects of energy development is most urgent. This urgency is underlined by the fact that only five percent of the natural lands at-risk from future energy production enjoy some measure of legal protection today. That is compounded in turn by the projection that 20 percent of the earth's remaining natural lands will be affected by future energy development. It ambitiously calls for shifting regulatory and mitigation efforts upwards, to a regional level.

Chapter Two's importance rests, in part, in the uncomfortable reminder that a tremendous amount of land is going to be needed to decarbonize energy production. The spatial footprint of a renewable energy system is exponentially larger than that of one based on fossil fuels. We may be asked to face the inevitability of a scenario where, in order to mitigate the impact of climate change, we industrialize the landscape via the vast spatial claim utility-scale renewable energy will make.

Part Two's seven case studies touch on challenges around the globe; Canada (petroleum), the United States (wind, petroleum, solar, and dams), Venezuela (offshore petroleum), Colombia (mining), Peru (energy infrastructure), Brazil (bio-fuels and dams), Mexico (dams) and China (dams) all are featured.

All merit commentary but this review only discusses three of those chapters – those that touch on Canada and wind/petroleum/solar in the United States. Mark Hebblewhite looks at the intersection between energy sprawl and wildlife conservation in northern Alberta and the western U.S. He focuses his attention on woodland caribou in Alberta and greater sage-grouse in the western U.S. For woodland caribou, he details what might appear as the impossibility of protecting and restoring woodland caribou. This possibility that this task is an impossible one arises first from the fact that the *Species at Risk Act* demands a "save it all" regulatory approach; each and every caribou population in Alberta must be addressed by the recovery plan. And the economic costs of this path are far too high.

Hebblewhite may be right to say that the law is mistaken in demanding that a recovery strategy/action plan address all the provincial populations of woodland caribou. But, it also should be noted that caribou are in dire straits because successive governments had a "develop it all" mindset when it came to the tar sands and the boreal forest. This mindset was captured notoriously in how the term "sterilization" was used by Alberta's energy regulator – it referred to any decision, such as establishing protected areas, that would keep a barrel of commercially-exploitable bitumen in the ground. To protect the landscape from development was to sterilize the petroleum resource; it was a heresy to suggest the brake should be applied to petroleum development in order to avoid sterilizing other objectives such as biodiversity.

Hebblewhite's second case, greater sage-grouse, is one that members of the AWA conservation community should wish could become the norm in Alberta and Canada. In the western U.S., the "develop it all" mindset was not allowed to govern policy making. Instead, a proactive planning approach that prioritized some, but not all, areas of the sage-grouse range was implemented successfully. The outcome seems to be good for sage-grouse and acceptable to petroleum and other commercial interests (not least because this outcome has succeeded in avoiding listing the greater sage-grouse under the *Endangered Species Act*).

Chapters Four and Five look at wind power development and solar development in the U.S. respectively. The chapter by Kiesecker, Evans, Sochi, Fargione, Naugle, and Doherty, like Hebblewhite's discussion of greater sage-grouse, offers sound advice on how biodiversity goals may be balanced with energy development. One of their recommendations is to site wind farms on previously disturbed sites. They write: "It makes sense to put new wind facilities on converted land areas that are low-quality habitats and already altered to such an extent that they can no longer viably support natural communities." And, as in Part One, the message here is that environmental assessments of these projects need to consider the cumulative effects.

The chapter on the development of utility-scale solar in the U.S. examines regional/conservation planning in California's Mojave Desert ecoregion. One of the constraints on developing solar in the region "was the lack of a landscape-level vision to balance energy development, resource protection, and other land uses." The Nature Conservancy's 2010 Mojave Desert ecoregional assessment built on important federal and California planning and assessment initiatives. The Nature Conservancy assessment's conservation value was strengthened by its focus on the entire, 33 million-acre, ecoregion. The desert lands were placed on a continuum ranging from Ecologically Core to Highly Converted. The conservation assessment was complemented by a regional analysis incorporating factors important to the solar industry. This approach determined that seven times the energy needed to meet California's 2020 renewable energy target could be produced on Moderately Degraded or Highly Converted Lands. Ecologically Core and Ecologically Intact lands could be spared from development if decision-makers adopted this approach.

Part Three advocates comprehensive energy planning and asks what interested parties need to do in order for sustainability to have an important place in the world's energy future. Balance and compromise are called for. Environmental groups, for example, could meet renewable energy developers halfway by prioritizing conservation lands, by identifying areas where they would accept the massive spatial footprint and areas where that footprint couldn't be tolerated.

The last chapter, written by the editors, outlines six themes that are seen as important to realizing a better balance between global energy development and conservation. They are: increase society's sense of urgency about the need to act, accept conservation trade-offs from renewables, reduce the time it takes to incorporate more renewables into the energy mix, facilitate master/landscape-level planning, catalogue policies and conditions that enable sustainable energy change, and prepare more case studies illustrating the social and economic benefits developing countries may garner from the sustainability approaches outlined in the collection.

The breadth of this collection is welcome. However, there are some notable geographical gaps. Readers interested in how African countries or those in the Indian subcontinent are addressing the challenge of sustainably producing the energy so many people in those regions need so desperately may be disappointed. No case studies from those regions are found in this collection.

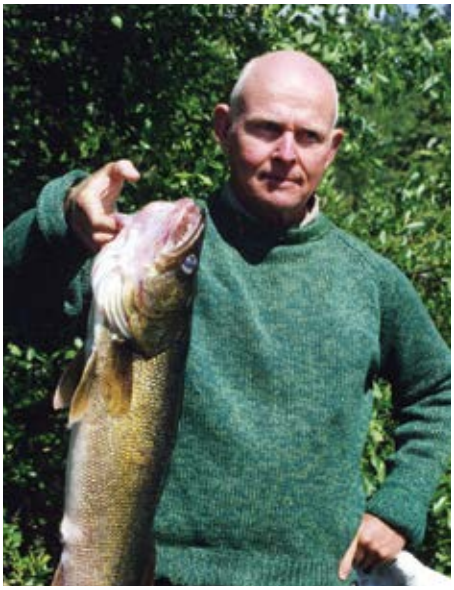
I also would have liked to see more attention paid to examining the obstacles that prevent the widespread adoption of what the collection regards as "best practices." For example, to what extent do countries have the institutional or administrative capacity to embrace the approaches recommended here. The chapter on Colombia and Peru raises this issue. As attractive and appealing as Colombia's minister of environment found the maps of ecosystem services he saw, he frankly didn't think his government had the administrative capacity needed to use them well. Capacity at the planning level then will affect the ability to bring good ideas to life; so will administrative capacity at the local level where implementation will take place. Cultural and economic contexts also need to figure more prominently in our thinking about generalizing "best practices' from one case to other countries.

Finally, there is an unspoken tension between the factors needed to better balance global energy development and conservation. Urgency, accepting conservation trade-offs, and increasing rapidly the percentage of renewables in the grid can conflict with what I felt a crucial message of this volume was, the need to plan for conservation well at the landscape/regional level. Alberta's recent history underlines well that this type of tension is not confined to developing nations that may not have the financial and educational resources needed to build planning capacity. The commitment to that planning has not been a strong suit in Alberta – the type of ecosystem assessment conducted in the Mojave Desert, for example, remains just a hope in Alberta as government and industry rush ahead to build wind and solar farms in southern Alberta.

In Memoriam

Richard (Dick) Pharis,

March 13, 1937 – July 3, 2018



Following nearly a month in Foothills hospital, Richard (Dick) Pharis passed quietly away July 3rd.

Dick was a founding member of the Alberta Wilderness Association, serving two terms as President. In later years, Dick remained active in AWA in projects including the annual maintenance of the historic Big Horn equestrian Trail west of Nordegg. He supported approximately 50 conservation/environmental groups in Canada, the US, Australia and New Zealand. Early involvement with the Civil Liberties Association chapter of Calgary was an indication of his humanitarianism.

Dick was born in Indianapolis, Indiana. As a young boy in Kentucky he fell in love with fishing. Later, growing up in the state of Washington, he learned to love the mountains and camping through the Boy Scouts. For the rest of his life Dick lived by the rule "Be Prepared."

After completing an undergraduate degree in Forestry at the University of Washington Dick went to Duke University where he received his PhD in Plant Physiology in 1961.

After working as a research scientist for the U.S. Forest Service in Oregon, Dick accepted a Post-Doctoral Fellowship at California Institute of Technology in Pasadena. At CalTech he had the pleasure of working with renowned scientists such as Linus Pauling.

From CalTech, Dick came to Calgary where he was hired in 1965 as a Professor of Botany at the University of Calgary. The Rocky Mountains definitely influenced this choice. Thus began a 53 year association with the University of Calgary and with Alberta's Eastern Slopes.

In 1967 he met and married Vivian Marilynn Baker, a former student in the Botany section of the Biology Department. They shared a love of wilderness and took many mountaineering trips on foot and horseback in Canada, the U.S., and New Zealand. In Australia, remote outback adventures were often two to three-week camel safaris. The two became a dynamic team in defence of wilderness and land conservation.

They built a house on an acreage north of Cochrane in the 1970s and kept pack and saddle horses for traveling Alberta's eastern slopes. From Willmore Wilderness Park to the Whaleback friends, students, and visiting scientists joined them on their sometimes lengthy trips.

Dick's lifelong passion was fishing. Hunting was another abiding passion enjoyed by both Dick and Vivian. It could have been for birds on the prairies with their Labrador retrievers or, more often, for big game in Alberta's foothills. As a prolific and accomplished photographer, Dick carried heavy camera equipment wherever he traveled in the world's wild places to document landscapes, wildlife and native plants. He often purchased local landscape paintings, some of which were donated to AWA for fundraising events.

Dick's research into the plant hormone gibberellin was internationally recognized in the field of hormone physiology. This work attracted researchers from around the world to his lab. He published extensively, with over 400 peer reviewed papers in prestigious journals.

He was recognized with Stacy and Killam Fellowships and in 1988 was invited to join the Royal Society of Canada because of his outstanding contributions to Canadian science.

Tributes from graduate students he mentored, now in many parts of the world, poured in during his final weeks. These students now carry on his high standards of scientific endeavor. Many others were welcomed into Dick and Vivian's personal lives, often sharing wilderness adventures and learning first hand, their conservation values.

Helping a friend plant the first vinifera vineyard in Oregon was a catalyst that led to his being one of the original members of the Grand Cru Wine Society in Calgary. When the opportunity arose in New Zealand, he became an owner and director of Torlesse Wines, a boutique winery located in the Waipara Valley north of Christchurch. For the past 25 years, Dick and Vivian have lived on their vineyard five months of each year, producing ten varieties of grapes for Torlesse.

Tributes from around the world indicate Dick influenced and shaped many lives, professionally and personally. In the words of a colleague "beneath his brusque, shy personality was a heart of true gold and a man of absolute honesty." He will be remembered for his passionate dedication to scientific excellence, high standards of professionalism, and dedication to conservation.

Dick is survived by his wife Vivian, his sister Lynne, as well as six brothers-in-law, seven sisters-in-law and eleven nieces and nephews.

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