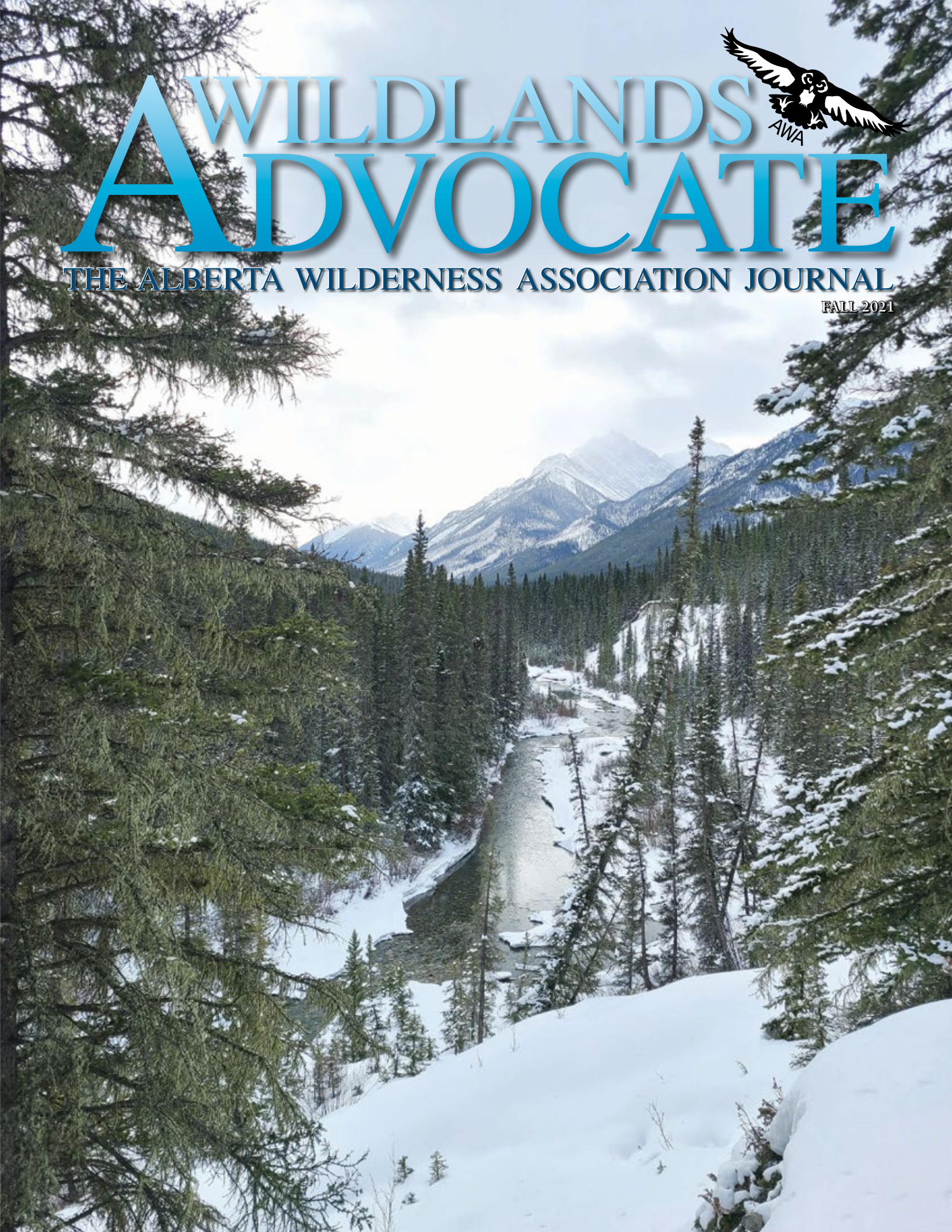

WILDLANDS ADVOCATE

THE ALBERTA WILDERNESS ASSOCIATION JOURNAL

FALL 2021

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Lindsey Wallis takes us cross-country skiing with this photo from along the Spray River. PHOTO: © L. WALLIS

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ALBERTA WILDERNESS ASSOCIATION

"Defending Wild Alberta through Awareness and Action"

Dedicated to the conservation of wilderness and the completion of a protected areas network, **Alberta Wilderness Association** is a voice for the environment. Since 1965, AWA has inspired communities to care for Alberta's wild spaces through awareness and action. With a provincial office and library in Calgary, AWA has active members, volunteers, and sponsors throughout Alberta and beyond. AWA is a non-profit, federally registered, charitable society. Donations and financial support are greatly appreciated, please call 403 283-2025 or contribute online at AlbertaWilderness.ca

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The Fellowship of Nature: Protecting the Rosebud River Valley

Fellowship is synonymous with December's holidays. They are opportunities for us to gather with family, friends, or those with whom we share an interest or sentiment. They are opportunities to enjoy the company of likeminded people.

One privilege of working with AWA is seeing a nature-focused fellowship blossom over the years. This fellowship grows when we build relationships with kindred spirits, when we join together to push for passing on healthy natural legacies to future generations.

Developing this nature-inspired fellowship is the conservation long-game. Being ahead in that game won't necessarily show up on today's score card. It may be the case, and certainly is in Alberta, that this fellowship grows while governing parties ignore it. For example, Yellowstone to Yukon Conservation Initiative released a poll in early December showing a strong majority of Albertans want to see a new park or protected wilderness in the Bighorn. Minister Nixon made it clear during second reading debate on the *Trails Act* that he's proud to be opposed to that ambition.

For now, one way to measure the success of nurturing a nature-inspired fellowship is seeing the commitments people make in their personal lives to privilege conservation values.

This is what brings me to the Rosebud River Valley, critical habitat for bank swallows and nesting sites for golden eagles. For years now, local landowners and people in the hamlet of Rosebud have opposed, using every conceivable means, the nightmare that a car racing enthusiast imagines for the valley – a car racing resort with multiple racetracks and accommodations.

This fall I met with Rick Skibsted and the Clarks (Richard and Wendy), three of those landowners. Their recent efforts to stop this madness will be featured in the next issue of the Advocate. Here I want to focus on the fellowship of nature they have helped to maintain and strengthen with respect to this very special valley in the heart of the Badlands.

Their families settled in the valley more than 100 years ago. At times, it must seem to them that their opposition to the racetrack has lasted as long. These landowners walk their conservation talk. Conservation animates their daily lives. In May 2020, for example, they placed conservation easements on more than 4,000 acres of land they own in the valley.

Wendy made the point to me that the opposition to the racetrack isn't just their show; many in the community are part of a growing fellowship intent on sparing the valley from the insult of the racetrack. Dozens and dozens and dozens of individual letters have been sent to NDP and UCP leaders alike; nearly 1,000 copies of their form letter have been sent to our last two Premiers (visit their website to see how involved they have been: https://www.savetherosebud.ca).

And then there's the issue of identifying/protecting critical habitat for the bank swallow, a threatened species under the federal *Species at Risk Act*. The Clarks and Skibsteds are part of an informal coalition of 18 landowners with properties stretching along more than 16 kilometres of the Rosebud Valley. They support efforts to help the bank swallow recover in their community. "We will continue to steward the critical habitat in the Rosebud River Valley," they wrote to Ottawa about the proposed recovery strategy for the swallow, "recognizing that keeping the valley in its natural state is the best protection for the bank swallow and all wildlife and native plants."

Today in the realm of politics and policy, the landowners in Rosebud haven't stopped the racetrack…yet. But they can claim to have contributed to mobilizing friends and neighbours to join them in developing a nature-inspired fellowship. Eventually, the growing conservation ethic they are part of will not be denied. The powers that be today will either bow before that ethic or be swept aside.

I hope that 2022 will be a year when we bring that future closer to becoming a reality.

- Ian Urquhart, Editor

Space — A Frontier No Longer?

By Lorne Fitch, *P. Biol.*

Outer Space may still be a frontier, but the space we call wilderness, a place to recreate in Alberta's Eastern Slopes is getting increasingly crowded. The refrain I hear, from people who remember the Eastern Slopes from a previous era echoes Yogi Berra's enigmatic statement that "no one goes there, it's too crowded." I know I'm reluctant to visit there based on my memories of a place much quieter, with less traffic and fewer people.

Some might retort with some accuracy this is typical complaining from an old grump. There is though a yin and yang aspect of growing old. On the minus side is constantly forgetting where you left the car keys. On the plus side are vivid memories of the "good old days" which form a significant benchmark against which to measure changes.

My formative years were spent in the Rocky-Clearwater and Bow-Crow forests, from the late 1950s through to my entry as a biologist in the early 1970s. During family excursions on the Forestry Trunk Road we would rarely encounter another vehicle. When camping at Ram Falls, we mostly had the place to ourselves. As I started independent hunting, fishing and hiking journeys it was similar—few other people and you could scan for game from the middle of the road without getting run over. I thought it was paradise.

That might not have been evident to Henry Stelfox who immigrated to Alberta in 1906 and became a conservationist and unpaid game guardian based near Rocky Mountain House. He would have found the Forest Reserve in the 1970s crowded by comparison to his earlier memories. Stelfox roamed the upper Clearwater watershed when caribou were still present, prior to the construction of the Forestry Trunk Road in the early 1950s. The Eastern Slopes might have been described as the "Big Empty" in Stelfox's time. Without benchmarks the sense of paradise shifts and paradise erodes imperceptibly to a shadow of a former time.

History teaches lessons in limits. Alberta has been through an earlier era of abundance; we are now in an era of over-exploitation. We need to move the dial to an age of prudent conservation and protection of what's left.

It's said, with evidence, that "the army of ecological destruction comes by road." It might be just as evident that the decline in recreational quality does so as well. Crowding, noise and declining fish and wildlife populations have those of us with long memories sensing the balance has tipped, or is close to it.

At least 20 cumulative effects studies of portions of the Eastern Slopes by government and arm's length organizations provide a compelling picture that road density and the logging footprint will shortly reach or has reached/exceeded ecological thresholds and the risks to water quality, hydrologic response (including more and bigger floods), threatened trout species, and several wildlife species are clear.

It's also clear that recreational interests are at odds with one another. We can't continue to do everything, everywhere, all the time, any time and not start running over each other, literally and figuratively. It's time for a day of reckoning and that includes all of us who recreate in the Eastern Slopes.

Space, once abundant and taken for granted has shrunken, to the point the Eastern Slopes are not the place to "get away from it all" but rather the place where "all have come to get away." AWA's Ian Urquhart sums it up with, "To boldly go where too many go now."

Added to a very busy landscape of logging, livestock grazing, petroleum development, gravel mining, coal exploration (and a few struggling coal mines) are random campers, off highway vehicle users, mountain bikers, e-bikers, hikers, anglers, hunters, geocachers, climbers, cross-country skiers, equestrian riders, paddlers, wildlife viewers, photographers, snowmobilers and drive-through tourists. The landscape is crowded and if the Covid years are any indication, our love affair with the Eastern Slopes isn't over, it is just beginning.

When I started my rambles in the Eastern Slopes Alberta's population was 1.3 million. Now it's 4.4 million with an average annual growth rate of 1.4%. That sounds low, but the math tells us that in another 25 years an additional 2.0 million people with economic and recreational interests will make Alberta home. Like the principle of compound interest, if the Eastern Slopes are busy now, imagine the future.

Fire marshals set capacity limits for buildings, restaurants can only serve those who can find tables and chairs and there are only so many seats on the bus. There is a direct parallel to the Eastern Slopes—it is not an expanding universe, like Outer Space. It is a fixed one with only so much room for our economic and recreational pursuits. The

Random camping in the Castle CREDIT: CASTLE CROWN WILDERNESS COALITION

more we ask to do and the more of us doing it in the Eastern Slopes, the less able these landscapes are to provide watershed function, a haven for fish and wildlife, and quality recreational opportunities. Recreation management is not about adding more to the Eastern Slopes but increasing the quality of recreation by resisting the things that will diminish the experience.

All of us have experienced the frustration of a decline in quality whether from a product, a service or an experience - such as a poorly designed coffee mug that leaks, inept, unhelpful sales clerks or too many bad trips to the Eastern Slopes because too many people got there before you. It leaves us feeling cheated somehow, that things could be better. But as quality continues to decline, we realize that without an intervention it's just going to get worse.

For decades we have set limits on livestock grazing on public lands through assessments of carrying capacity. If we can do it for cows, we should be able to tackle human carrying capacity in the Eastern Slopes although it would seem easier to describe the limits for cows instead of people.

Recreational carrying capacity is concerned with determining the number of users that can be accommodated by a given area without loss in the quality of the natural environment and/or the recreational experience. It is challenging, but not impossible to integrate human values into resource management decisions.

Other jurisdictions facing human population pressures have addressed how to protect landscapes and essential ecological functions while at the same time providing quality recreational experiences. A spectrum of options has been used but the consistent theme is that other jurisdictions treat recreation as a land use requiring planning, management, evaluation and enforcement.

While there is no magic formula for setting recreational capacities, the beginnings might be found in the policies that initially set up the Eastern Slopes into Forest Reserves, national parks and provincial parks and protected areas. Watershed protection, either explicit or implicit, leaps to the front as a priority in all these areas, in spite of repetitive resource management decisions that run counter to the good words and intents. What we need the Eastern Slopes to be and do should be the foundation, not just satisfying every want, often at the expense of sacrificing our needs, like protecting water.

If we can agree there are ecological capacities that shouldn't be exceeded, there is a starting point. That is a big if, since some refuse to acknowledge their recreational pursuits diminish environmental quality. Paradigm shifts are hard because Albertans seem hard wired to view use of the Eastern Slopes as an entitlement. Despite this, we have been given the gift of a common problem, how to effectively manage the Eastern Slopes.

To a degree the argument might hinge on how one defines "quality." Recreational quality can be related to perceptions of crowding, or exceeding physical capacity. It can be tied to facility capacity, as in what amenities like campgrounds, parking lots or restrooms are available. How one defines quality is also tied to social capacity, freedom of choice or how one reacts to crowding, competition, noise and possibly the perception of threats or danger from other recreationalists.

To some, a Dogpatch-like accumulation of recreational vehicles scattered over every level piece of a stream-side meadow, at the hub of a spider's web of muddy off highway vehicle trails, with random firepits, hacked off trees and no toilet facilities might be considered as a quality recreational experience. This does not meet the test for environmental quality because of compacted soils, loss of water infiltration, erosion and sediment additions to streams, displacement of wildlife, loss of riparian vegetation and possible contamination of water quality from no toilet facilities.

Since this is an issue of regional planning, where is the Alberta government headed? Only two of seven regional plans have been published and there are glaring deficiencies in these. The rest are dead in the water and indicate an antipathy to regional planning, the logical place to have discussions on a variety of land uses, including recreation.

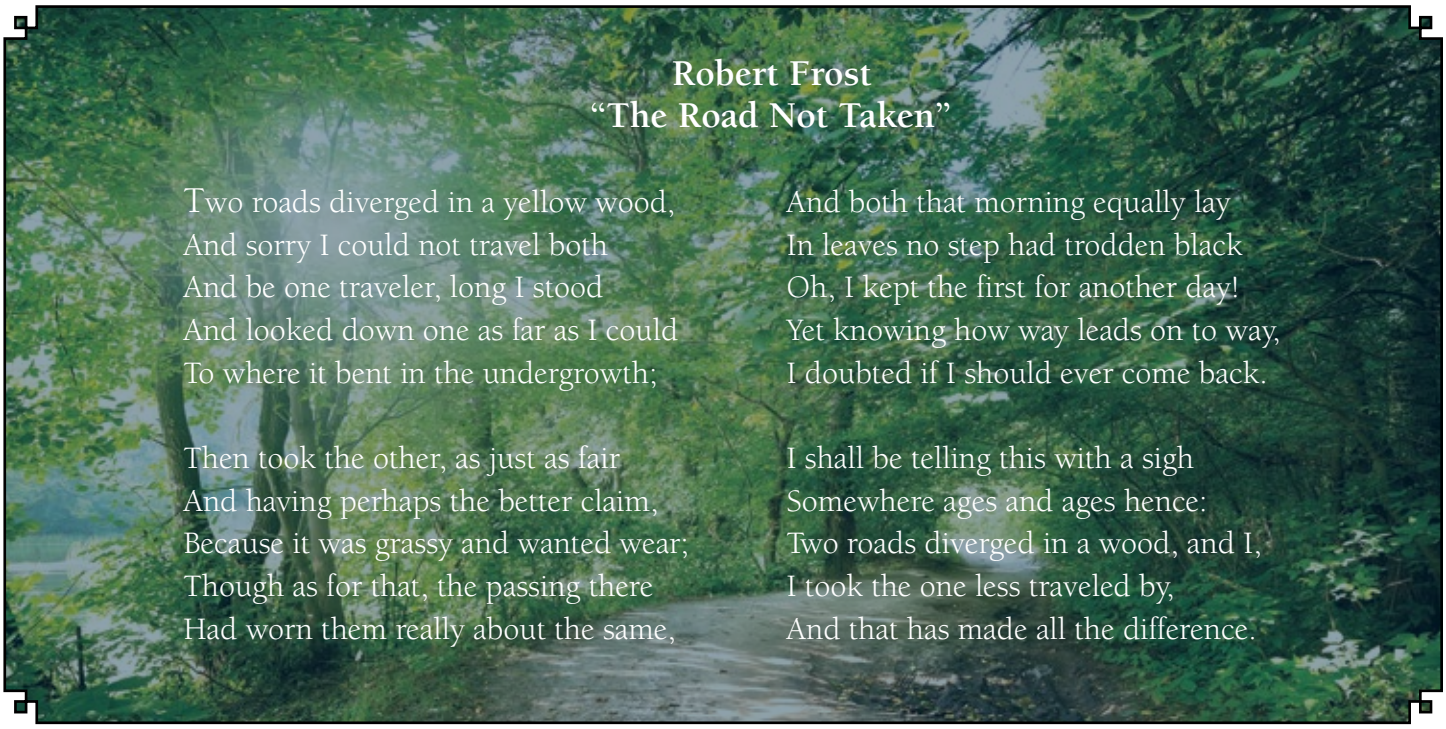
In southern Alberta, the Livingstone-Porcupine Hills (L-PH) Land Footprint Management plan plotted a course to deal with a very busy landscape that, like a boiling kettle, was screaming for attention. The issue of road and trail density was addressed with a line in the sand threshold. This was subsequently blown out of the water with the Alberta Energy Regulator approving new coal exploration roads which now exceed the thresholds for linear density. The recent *Trails Act* is a blatant attempt to circumvent the ecological thresholds for road density and jump over a subregional plan that had broad public involvement and consensus. Promised, in the L-PH plan was the setting of spatial footprint thresholds to deal with industrial land uses like logging. Three years later there is no indication that the spatial footprint is being addressed. Continual failures to address carrying capacity compound over time.

For recreation the direction seems oblivious to the existing and future recreational pressures in the Eastern Slopes. It's hard to see clearly when there are loonies over your eyes. A government funded study by the Tourism Industry Association of Alberta (2021) had six recommendations about growing recreation, but made no mention of how to manage growth to protect ecological values or how to maintain recreational quality. We have yet to learn that more is not better.

Would limiting recreational use to enhance recreational experiences be easy to implement in the Eastern Slopes? Hardly! Given our tendencies of redneck freedom, this would not be viewed as visionary, but rather of overreach and too restrictive. However, if we took a clear view of crowded parking lots, increasing levels of frustration and anger between recreational interests, biodiversity concerns, an increasingly trashed landscape and a decline in perceptions of recreational quality we might at least be moved to start a conversation.

The reality, with population pressures and expectations is we are not going backward to an era of abundant empty space and fewer people. What we can do is start, with vision and restraint, on a way to salvage recreational experiences in the face of increased population pressures. It's not too late, but it will be soon. If we don't acknowledge the trends, the fear is we will kill the goose (the Eastern Slopes) that lays the golden eggs (quality recreational experiences).

Lorne Fitch is a Professional Biologist, a retired Fish and Wildlife Biologist and a past Adjunct Professor with the University of Calgary.



Robert Frost
"The Road Not Taken"

Two roads diverged in a yellow wood,
And sorry I could not travel both
And be one traveler, long I stood
And looked down one as far as I could
To where it bent in the undergrowth;

Then took the other, as just as fair
And having perhaps the better claim,
Because it was grassy and wanted wear;
Though as for that, the passing there
Had worn them really about the same,

And both that morning equally lay
In leaves no step had trodden black
Oh, I kept the first for another day!
Yet knowing how way leads on to way,
I doubted if I should ever come back.

I shall be telling this with a sigh
Somewhere ages and ages hence:
Two roads diverged in a wood, and I,
I took the one less traveled by,
And that has made all the difference.

Provincial Grazing Reserves and Grasslands Conservation

By Ruiping Luo

Conservation of Alberta's grasslands is inescapably linked to the agricultural use of the land. In particular, many grassland ecosystems support grazing livestock and some of the province's best remaining native prairie landscapes are contained within Provincial Grazing Reserves. As public lands, these reserves are managed under the multiple use framework. Grazing needs are balanced with recreational and industrial uses, as well as conservation goals. While Provincial Grazing Reserves can help preserve native grasslands, how much do these reserves truly protect vulnerable habitats?

Introduction to grasslands

As an ecosystem, grasslands are often overlooked. Distinguished by large open areas of grass and grass-like vegetation, grasslands, also known as prairies or rangelands, are estimated to cover 30% of land globally. Thus, they constitute one of the most common environments on Earth. Contained within the northern end of the Great Plains of North America, the grasslands region of Alberta covers an area of 95,566 km2, accounting for 14.4% of the province. Included in that area are some of the world's best and largest remaining tracts of native prairie.

These grasslands are essential for biodiversity. They provide habitat for a variety of reptiles, amphibians, birds and mammals, and have been historically known for their large grazers, including bison, pronghorn, elk, and deer. The Great Plains contain over 460 rare and imperiled plant and animal species, with 70% of those considered as endemic or near-endemic, meaning these species are only or mostly found in the grasslands of North America. The North America Breeding Bird Survey has noted Alberta's grasslands for their diversity in breeding bird species and many animals rely on grasslands for at least a part of their lifecycle.

Additionally, grasslands provide many benefits through ecosystem services. Not only do they allow places for recreation but healthy grasslands filter pollutants from air and water, improve and stabilize soils, prevent nutrient loss and regulate flooding. As well, native grasslands store carbon. Alberta's native grasslands alone store three times the annual greenhouse gas emissions of Canada, according to one report prepared for the Alberta Sustainable Resource Department (ASRD). They provide a massive aid to mitigating climate change. Carbon storage in grasslands is mainly belowground, in soils and roots, and as these underground stores are less impacted by seasonal fires and drought, this carbon can remain in soil for centuries. Losing these lands would mean more than losing their beauty; it would mean losing the benefits they bestow, along with many of the iconic species that rely on them.

Grassland threats and conservation

Grasslands are already greatly threatened. In 2008, the International Union for Conservation of Nature (IUCN) declared grass-

Sage flats in the Sage Creek Watershed in southeastern Alberta PHOTO: © L. FITCH

lands to be the world's most endangered ecosystem, and temperate grasslands, like those in Canada, to be at particular risk. The declaration was reinforced in 2020 with a call for greater understanding of and protection for these vulnerable environments. The Canadian Parks and Wildlife Society (CPAWS) states Canada has already lost nearly 75% of its natural prairies and less than half of Alberta's native grasslands remain. With their loss, many of the species that rely on native grasslands are also in decline and approximately three-quarters of Alberta's species at risk are found in the grasslands region.

In Alberta, grasslands are under continued threats from human activity. The Alberta Biodiversity Monitoring Institute (ABMI) found conversion of native prairie for settlement, industrial development and agriculture has altered over 60% of Alberta's grasslands. Agriculture has had the largest impact. Human activities continue to encroach on the remaining areas through resource extraction, conversion of land for farming, and urban expansion. Only 1.25% of these grasslands are protected, a disproportionately low amount compared to the over 60% protection enjoyed by the Rocky Mountain region. Conservation of the remaining native prairie needs to be a priority, before the remains of this once-vast ecosystem are entirely lost.

Grassland use and management

Protection of Alberta's grasslands is complicated by their inclusion primarily in the White Area. Alberta's lands are categorized into two distinct areas: the Green Area, which encompasses the province's northern forests, mountains and foothills, and the White Area, encompassing the southern prairies. Compared to the Green Area, the White Area is more populated, and most of the land is owned privately. The White Area also contains the vast majority of agricultural activities. As a result, conservation of Alberta's grasslands requires consultation and collaboration with several different interest groups and management of competing uses for the remaining lands.

Many economic benefits derived from these lands, such as mineral extraction or cropland production, involve large-scale destruction and conversion of native prairie. These disturbances eradicate precious habitat, increase erosion, alter the plant community, and disturb the underlying carbon stores. They reduce the ability of the ecosystem to provide essential services and contribute positively to climate change. Recovery from disturbances, when attempted, is slow and not guaranteed. This is especially true where the altered environment attracts invasive species, which can displace native flora and fauna, permanently changing the landscape.

Livestock grazing is an important use of these lands. In contrast to most other economic uses, well-managed livestock grazing has relatively few damaging impacts on grassland ecosystems and the activity is capable of occurring on unconverted native prairie. Just as the prairies evolved under grazing by large herbivores, grazing can also aid in grasslands management. Studies have found a moderate amount of grazing can positively alter the prairie ecosystem, increasing biodiversity, improving water filtration and potentially encouraging carbon storage. When well-managed, livestock grazing can promote healthy grassland ecosystems.

Grazing on Alberta's public lands is managed through grazing dispositions. A large area of these public lands are managed under Grazing Leases, which cover 5,200,000 acres, and Provincial Grazing Reserves, which cover another 720,000 acres. Under the provincial government, Grazing Leases are defined as "long-term authorizations to individuals, corporations or associations," while Provincial Grazing Reserves are "community pastures located throughout the province, providing a significant amount of local public land grazing." Though Grazing Leases have been under intense public scrutiny recently, Provincial Grazing Reserves have been largely ignored.

The difference between Grazing Leases and Grazing Reserves lies in how the lands under dispositions are managed. Grazing Leases are issued directly to the individuals or organizations maintaining livestock on the lands. These actors are responsible for management of the area, including access for industrial or recreational use. In contrast, Grazing Reserves are often managed by an association. The association manages livestock foraging from multiple individuals, while the province maintains control over other land uses. As a vast amount of the remaining native prairie in the province occurs in areas of livestock grazing, the management of these lands is of critical importance to grasslands conservation.

History of Provincial Grazing Reserves

During the Great Depression, the Grazing Reserves program was launched in response to local farmer and rancher requests for pastureland. The first reserve was established at the Twin River site in 1934 and, in 1957, the first irrigated reserve was established at Purple Springs. Since then, 32 Grazing Reserves have been established throughout Alberta, with the last reserve launched in 1986. Of these, eight are located in the grasslands, covering nearly 260,000 acres. By 1999, responsibility for the management of livestock and forage resources on all reserves had been transferred to grazing reserve associations under grazing management agreements. These grazing associations maintain the land and structures, including fences. Access to and activities prohibited in these lands remains under the control of the provincial government.

The establishment of new reserves in the 1970s and 1980s caused difficulty with hunters and recreational users already using the land. The contested land contained resources that were coveted by other sectors, as well as harboring wildlife habitat. To resolve these conflicting demands on the land, the multiple use concept was developed. This land management philosophy attempts to balance the requirements of different groups and maintain sustainable natural resources, and is currently used to

manage all public lands in Alberta.

However, the focus of the Provincial Grazing Reserves remains on agricultural use. The Alberta government writes: "The main purpose of these reserves is to provide summer pasture for Alberta's farmers and ranchers on public land" although the regions remain open for recreational activities and development, including drilling for oil and gas. While the provision of suitable habitat for wildlife is mentioned, this goal is largely secondary to maintaining a productive and sustainable forage for livestock.

Conservation in Provincial Grazing Reserves

Despite the primary focus on forage, Provincial Grazing Reserves can provide protection to large sections of native prairie. Grazing Reserves prevent conversion of prairie habitat for other uses, such as cropland, and well-managed livestock grazing can benefit the grassland environment. As well, to maintain sustainable forage, a carryover of 50% is required. Carryover is the amount of forage produced during the growing season that remains ungrazed and a carryover of 50% indicates half the vegetation must remain after grazing. This requirement helps to protect plants and soil, enhance water filtration and provide habitat for wildlife. In this way, the provision of pastureland can benefit grasslands conservation goals.

Conservation efforts vary greatly between reserves. Some attempt to manage grazing in ways that account for wildlife. For instance, at Sage Creek, one of the most intact and diverse areas of the Great Plains, the Provincial Grazing Reserve has set a higher carryover of 70% as an allowance for grazing wildlife. At Lonesome Lake, where developed water basins provide nesting habitat for waterfowl, grazing near these areas is deferred until nesting is completed. Others, such as Bow Island, are noted for their abundant wildlife populations, including deer, antelope and upland birds, although no active efforts to protect these populations have been announced.

However, Provincial Grazing Reserves do not always protect grasslands ecosystems. While reserves prevent large-scale conversion for other uses, recreational and industrial activities are allowed, including oil and gas wells, pipelines and roads. These activities can reduce grassland health as well as encourage invasive species growth. In addition, sections of reserves have been cleared and seeded to tame forage or irrigated. Tame forage is less desirable to wildlife, and can result in lower soil health and carbon sequestration compared to native prairie. Similarly, irrigation displaces dryland plant species, changing the grassland community, sometimes irreversibly. Projects for continued industrial development or additional irrigation could depose many native plants and should be limited to prevent further loss of irreplaceable prairie habitat.

As well, although well-managed livestock grazing has been praised for its benefits, poor management can have severe consequences for the ecosystem. Overgrazing not only results in extensive loss of vegetation that many species rely on for habitat, it can lead to erosion and loss of fertile soil. An inch of topsoil forms over 500 or more years, so any losses in soil require time to recover. Livestock grazing can also cause conflict with native wildlife, through competition with other grazing species or predation on livestock. Careful monitoring of Provincial Grazing Reserve use is crucial to ensure sustainable forage growth and prevent conflict and degradation of prairie ecosystems.

Provincial Grazing Reserves may prove an economically viable method for helping to conserve Alberta's remaining grasslands. The reserves protect against large-scale conversion of native prairie for other land uses and good management of grazing livestock can benefit the grassland ecosystem. However, to prevent further damage to these fragile ecosystems, use of these lands needs to be carefully monitored, and further development limited. Provincial Grazing Reserves allow the province more direct control than many other grazing dispositions – control that could be used to restrict industrial access and preserve the health of the remaining native prairie. Additionally, while some concessions to conservation have been made, these efforts can and should be expanded on. Grasslands continue to be under threat from agricultural, industrial and urban expansion. With so much of Alberta's native prairie already lost, every remaining acre is precious and steps must be taken to protect these vulnerable lands.

Three grasslands species at risk: Great Plains Toad, Mountain Plover, and Short Horned Lizard PHOTO: © C. WALLIS

No money, no answers

By Phillip Meintzer, *AWA Conservation Specialist*

Alberta's Oil Sands Region (OSR) spans 142,000 square kilometres across northern Alberta, encompassing more than one fifth of our province's land area. Approximately 30% of this region is comprised of two types of wetland ecosystems – bogs and fens. These wetlands are productive landscapes dominated by the presence of sphagnum (aka. peat) mosses which play a crucial role in the maintenance of healthy watersheds and provide much needed habitat for a host of wildlife species such as migratory waterfowl. Over the past several decades, industrialization has increased pressure on Alberta's wetlands resulting in the loss and degradation of these ecosystems. Continuous monitoring and mitigation of human impacts is a paramount precondition for maintaining healthy wetland ecosystems into the future.

The Oil Sands Monitoring program (OSM) began in 2015 as a collaboration between the Governments of Canada and Alberta. It replaced the previous Joint Canada-Alberta Oil Sands Monitoring (JOSM) program that operated for three years beginning in 2012. The OSM program was created to monitor, evaluate, and report on the environmental impacts of oil sands development in the OSR, to assess the risks of impacts, and improve our understanding of the state of the environment in an open and transparent manner. OSM seeks to answer the following three questions which guide all monitoring and research efforts of the program: A) Is there a change in ecosystem state? B) Is the change due to oil sands development? C) What proportion of the observed cumulative effects can be related specifically to oil sands development?

Alberta Wilderness Association (AWA) has participated in the OSM program since its inception (and the transition from JOSM); AWA has been the sole ENGO representative on a number of Technical Advisory Committees (known as TACs), which are accountable for designing monitoring programs to address the priorities set out by the Oversight Committee. TACs work in conjunction with an Indigenous Community Based Monitoring Advisory Committee to identify opportunities and develop recommendations for the funding of key components within the annual work plan cycle and report directly to the Science and Indigenous Knowledge Integration Committee. TAC delegates are selected to serve a maximum three-year term and AWA currently participates on the wetlands, terrestrial biodiversity, and groundwater TACs.

Alberta's Wetland Policy – published in September 2013 – dictates the Government of Alberta's strategic intent for the management of wetlands in the province. It proclaims the explicit goal of conserving, protecting, and managing Alberta's wetlands to sustain the benefits they provide to the environment, society, and the economy. OSM's wetland monitoring program is intended to support the Alberta Wetland Policy through evaluation of, and reporting on, the status of wetlands areas over time. To achieve this objective, research projects need to be funded as part of the annual work plan cycle, and these projects require continuous funding to ensure that their research can remain ongoing and adequately track wetland status over time as intended.

However, this isn't always the case.

Since 2009, Dr. Kelman Wieder (Villanova University), Dr. Melanie Vile (West Chester Univeristy), and Dr. Dale Vitt (Southern Illinois University) have been involved in the wetlands monitoring portion of the OSM program. They are studying the impacts of oil sands development on both bogs and fens in Alberta's OSR and are making important findings in the process. One of the key findings from their research is the observation that atmospheric nitrogen emissions produced through oil sands operations have continued to increase over the past 20 years. This has greater concentrations of nitrogen to be taken up by wetland ecosystems – leading to significant changes in ecosystem species composition and mineral deposition regimes.

For context, bogs are classified as ombrogenous and ombrotrophic. This means they receive all water and nutrients from precipitation. Fens, on the other hand, are considered geogenous – connected to a ground or surface water source, yet minerotrophic – receiving nutrients from both precipitation and groundwater. These characteristics make both bogs and fens highly susceptible to mineral deposition from external sources, such as the nitrogen and sulfur produced through oil sands operations. The effect of this mineral uptake could have negative consequences for Alberta's wetland ecosystems in the OSR.

Across two studies conducted over a five-year period, the researchers from Villanova University experimentally added nitrogen to bogs and fens within the Mariana Lake peatland complex, a wetlands area south-

The patterned fen of the McClelland Lake Wetland Complex. The patterned character of this remarkable fen is the result of flarks (depressions) and strings (raised ridges where spruce and other trees grow). PHOTO: © C. WEARMOUTH

west of Fort McMurray. These experiments simulated rainfall according to various nitrogen deposition scenarios in order to assess the responses of both ecosystems to nitrogen addition – much like what can happen as a result of oil sands operations. The uptake of excess nitrogen by these environments resulted in a shift in species composition within both bog and fen ecosystems. It led to a decrease in peat moss abundance and an increase in the growth of shrubs. This transition could change the landscape further because increasing shrub cover can shade peat mosses from sunlight. This hinders their productive abilities and further decreases their abundance. This transition from a moss-dominant to shrub-dominant landscape reduces the primary productivity of bogs and fens, meaning that oil sands operations are likely a source of direct harm to the the productivity of nearby wetlands through atmospheric deposition.

Following these two studies, in 2020 the Villanova University research team published another paper which outlined a standardized protocol for monitoring plant responses to changing nitrogen deposition regimes in Alberta's bog ecosystems. This paper recognized that, at the time, there were no detailed or established protocols for monitoring the potential changes that nitrogen deposition could elicit in these sensitive boreal ecosystems. Therefore, they saw the need to create and publish one of their own. The protocol outlined in this paper is intended to be user friendly. It will allow for monitoring potential plant and lichen responses to future nutrient inputs into wetland environments while providing a structured and replicable method for collecting data.

The development and application of this monitoring protocol should be paramount to ongoing wetland monitoring activities under OSM to ensure that the impacts of mineral deposition on wetlands are recorded over time. Unfortunately, in June 2021, the Villanova University research team was ordered to suspend their work, because their research was not going to be funded under the current year's budget. Instead, the project team was instructed by the Oversight Committee to focus on transitioning to core monitoring work in consultation with the TAC. This news came as a shock to Dr. Wieder as well as others involved in the wetlands monitoring TAC. In response to the decision, Dr. Wieder penned a letter to AEP, outlining a summary of the important work completed to date, and sharing his own disappointment at the decision not to fund their research under the current work plan.

The atmospheric deposition research was not the only study that suffered in the 2021 budget, as the wetlands TAC overall only received 45% of the funds it requested. Part of the issue is that the total funding available for OSM each year is set at roughly $50 million, which was negotiated with oil sands companies nearly a decade ago at the onset of the original JOSM program in 2012, and has remained static ever since. This constant sum must be distributed amongst all OSM programs annually. Because it loses value each year due to inflation, it becomes more and more difficult to fund all the intended, and much-needed, research. It is important that monitoring activities be cost effective to ensure that the available funds are mobilized in a suitable manner. However, the cost of monitoring is only increasing and this arbitrary limit of $50 million merits reevaluation if it is insufficient to fund the research needed to protect these important ecosystems. Looking at inflation alone, the Bank of Canada inflation calculator states that that $50 million in 2012 dollars is equivalent to $58.5 million in 2021, yet the monitoring budget continues to remain static regardless of inflation or the need for additional monitoring resources.

Following the funding announcements, several TACs have raised a shared concern about the lack of transparency regarding the reasons why projects are funded or not. Using Villanova University's situation as an example, there seems to be no clarity on why their research was deemed suitable in previous years, but not in 2021. If their research met the priorities set by the OSM Oversight Committee last year, then has something changed over the past year to make this monitoring work unsuitable? The lack of any clearly communicated justifications makes this decision difficult to understand and to support, especially given the importance of their research to date.

AWA has supported Dr. Wieder's research over the time that we have been involved in the OSM program and we were hoping to see it continue into the future. The long term impacts to wetlands from industrialization need to be monitored to ensure that Alberta maintains the health of its wetland ecosystems and meets its own goals outlined in the Wetland Policy. There can be no benefits of wetlands for us to enjoy without the wetlands themselves, so we need to ensure that adequate checks and balances are in place to protect them. We hope to see Dr. Wieder's research funded appropriately in the future.

Ground level view of a flark and string in the McClelland Lake Wetland Complex. PHOTO: © C. WEARMOUTH

Sterilizing Alberta's Forests

By Devon Earl, *AWA Conservation Specialist*

The use of herbicides and pesticides in agriculture is a contentious issue as more and more emerging research elucidates the negative effects that these chemicals have on the environment and human health. However, many people don't realize that forests worldwide are also treated with herbicides, specifically glyphosate, and have been for many years. Given that herbicides are designed to kill living organisms, there is good reason to be concerned about their effects on human health and on the environment. Altering the microbial, fungal, aquatic, and plant communities of our ecosystems can have drastic cascading effects throughout the ecological community.

Although a growing body of research details the potential harmful effects of glyphosate, it continues to be the most widely used herbicide in the world. Glyphosate is often applied to agricultural crops to prevent weed species from growing. Crops like soybean, maize, and cotton are often genetically-modified to be resistant to glyphosate, allowing them to grow while other plant species are killed. The International Agency for Research on Cancer considers glyphosate a probable carcinogen for humans. Its use has been banned or restricted in several countries, including Austria, Oman, and Vietnam.

Glyphosate is not only a concern in our agricultural lands, but also in our forests. Glyphosate-based herbicides are sprayed on regenerating cutblocks to kill deciduous trees like aspen and birch. These trees compete for space, light, and nutrients with the coniferous trees like spruce and pine that many forestry companies want to grow. Planting forests with a single species of conifer, while spraying glyphosate to kill deciduous trees, promotes forests that are much more like plantations than natural ecosystems. This is part of a much larger issue – our forests are managed primarily for their timber value, disregarding the many other vital values that they provide. Applying glyphosate reduces competition for conifers, allowing them to re-establish faster and thus shortening the harvest rotation. In Alberta, over 30,000 hectares of land (300 square kilometres) were sprayed with glyphosate in 2017.

Glyphosate doesn't only have detrimental effects on deciduous trees. It also can alter the survival and growth of understory vegetation. An example of glyphosate's detrimental effects on vegetation is the prickly rose (*Rosa acicularis)*; glyphosate damages its reproductive ability. Research indicates that glyphosate reduces the forage (food) availability for wildlife drastically by killing various shrub species. This may have contributed to the decline in moose populations in British Columbia. Glyphosate is touted as safe because it supposedly breaks down rapidly and doesn't persist in the environment, but research indicates that it is detectable in some understory vegetation species for as long as a year after it has been applied. This raises concerns about potential health effects on species that feed on these plants, including on people who use them as food or medicine.

Perhaps the greatest concern is the effect of glyphosate on the smallest of organisms. Soil bacteria and fungi are vital to the health of a forest, similar to how the gut microbiome is vitally important to human health, and both are affected by glyphosate. Glyphosate alters the bacterial composition of soil, and in some cases glyphosate could lead to nutrient deficiency in soil by suppressing nitrogen-fixing and assimilating bacteria. Mycorrhizal fungi are species that form symbiotic relationships with most plants, allowing plants to communicate with one another and obtain nutrients from the soil. These fungal communities are altered by the use of glyphosate, and in some cases glyphosate may favour the growth of pathogenic fungal species. Fungal and bacterial communities are poorly understood, but are known to be vitally important to ecosystem function.

An important ecosystem function of Alberta's forests is in supporting vital headwaters, which host important aquatic ecosystems and provide drinking water for Albertans. A 2014 study on U.S. waterways found glyphosate and its degradation product AMPA in the majority of rivers, streams, and ditches that the researchers tested. These herbicides are particularly detrimental to amphibians, because shallow ponds and wetlands where they reproduce can accumulate pollutants. One study showed that Roundup, a glyphosate-based pesticide, killed all individuals of two species of tadpoles and nearly wiped out a third species. Glyphosate can also adversely affect fish species such as trout by inducing oxidative stress. In Alberta waterways containing dwindling populations of threatened bull trout, Athabasca rainbow trout, and westslope cutthroat trout, we can't afford to add herbicides to the list of stressors that these species are subjected to.

Glyphosate's impact on invertebrates is another reason for concern. Honeybees are particularly sensitive to glyphosate, and can experience cognitive decline in the presence of this herbicide. The effects of glyphosate

*Fish such as the Threatened westslope cutthroat (*PHOTO: © D. MAYHOOD*) and invertebrate pollinators such as bees (*PHOTO: © K. MIHALCHEON*) are harmed by glyphosate*

on insects and pollinators is important because it adds to the ongoing global decline of pollinators and the biodiversity crisis. Earthworms, another crucial organism to ecosystem health, experience decreased body weight and reproduction in soils treated with glyphosate. Invertebrate species provide food for wildlife, so the effects of glyphosate flow through the food chain, affecting insectivorous species who rely on these organisms as food and then carnivores at the next level of the food chain.

One issue that may hit closer to home following the summer of 2021 is forest fires. All Albertans have been affected in recent years by the terrible wildfires in Western Canada and the accompanying plumes of smoke that cover the sky and suffocate the sun for weeks each summer. Alberta forestry claims that their logging practices are actually designed to reduce forest fires, but this is questionable in important respects. As mentioned above, reforestation practices often involve spraying forest stands with glyphosate to kill deciduous trees, and replanting with conifer monocrops. While these conifers may have a higher timber value, they are much more susceptible to fires than natural, mixed forests. Deciduous trees like aspen keep forests cooler and are less likely to catch fire and to burn. So, by killing all the aspen, we destroy natural fire buffers and create forests that are susceptible to burn hotter and over a larger area. In a world where the climate is warming, and drought is becoming more prevalent, this can hardly be considered a good choice. The government of Alberta and forest companies should understand the importance of allowing deciduous trees to grow in regenerating forests, if only to protect their precious timber supply from wildfire.

Alberta's forests are managed based on the concept of "sustainable yield." This means the annual allowable cut of forests is based on the amount of timber that can be regrown each year. This calculation is made to ensure there will continue to be trees to harvest in the future. The concept of sustainable yield is also a way for the forest industry to convince the public that they are environmentally responsible. In reality, this is a very narrow view of sustainability. It doesn't demand that forests will be sustainable according to biodiversity, water quality, or any other ecosystem service that forests provide aside from timber. Sustainable yield means that the quicker forestry companies can regenerate the type of tree they want to harvest, the more they can harvest each year. This encourages widespread use of glyphosate. Conventional sustainable yield models don't treat seriously enough the increasing risk of forest fire with both climate change and the decrease of deciduous trees like aspen with glyphosate use. The timber-centric focus of forestry overlooks and ignores other forest values.

Glyphosate use should be governed by the precautionary principle. Rather than using glyphosate until its negative consequences are overwhelmingly evident we should not allow glyphosate use until it is proven to be safe. We should not be risking our province's ecological integrity, and the biodiversity of the world, to be able to harvest timber at a faster rate. The more responsible understanding of the value of forests lies well beyond just the economic value of the timber that they provide; A truly sustainable forest management regime should recognize and appreciate all these values. Ecosystems like forests are interconnected in complex ways that aren't fully understood yet. Altering components of the forest like the fungal, microbial, and plant communities is likely to have far-reaching effects that we don't even know to look out for. It is much better to proceed with caution, rather than assume that introducing this toxic herbicide to our forests will have no effect until those effects are undeniable and irreversible.

Native Trout Critical Habitat Trip

By Phillip Meintzer, *AWA Conservation Specialist*

Back in September, I had the unique opportunity to join Dave Mayhood – an aquatic ecologist and the president of Freshwater Research Ltd. – on a trip to visit critical habitat sites for threatened species of native trout along Alberta's Eastern Slopes between Calgary and the Crowsnest Pass. From Calgary we drove to Longview and then west along Hwy 541 to its junction with the Forestry Trunk Road. We then took Highway 40 south to Coleman and then continued south through Blairmore into Castle Provincial Park. As we worked our way south, we stopped at numerous creeks and rivers and I was able to witness first-hand the impact industrial development is having on critical habitats that are crucial for the recovery of trout populations in Alberta.

Westslope cutthroat trout (WSCT), bull trout (BT), and Athabasca rainbow trout (ART) are three species of trout native to cold water streams in Alberta. As of 2019, all three are listed on the federal Species at Risk Act (SARA) as either Threatened or Endangered. Under SARA, the killing, harming, harassing, capturing and taking of listed species is prohibited and this includes activities that destroy identified critical habitat. During my trip with Dave, we stopped at many listed WSCT and BT critical habitat sites. The majority of these watersheds display evidence of nearby natural resource extraction. Logging, coal exploration and mining operations, gas wells, pipe and seismic lines, as well as all of the road networks servicing these industries pose serious risks to the recovery of these imperiled fish. My trip with Dave helped me better understand the magnitude of these threats and their cumulative impacts near and in designated critical habitats.

According to Dave, Alberta hasn't conducted environmental impact assessments

A section of Lynx Creek in Castle Provincial Park showing bank stabilization efforts along the right hand side of the image. Lynx Creek drains into the Carbondale River and is designated as containing critical habitat for pure strain WSCT.
PHOTO: © P. MEINTZER

to investigate the cumulative impacts of logging and associated linear disturbance (i.e., forestry roads) to fish and fish habitats. One of the major realizations that I had about the problems facing fish recovery during this trip was just how easy it was to access many of these critical habitat sites due to the number of roads that are present throughout the landscape. Not having traveled in rural Alberta for years, I was surprised at just how many creeks we were able to drive right up alongside or across, as I had naively expected many of these sites to be significantly more isolated from the footprint of human development. This certainly was not the case. SARA recovery strategies recognize these streams as critical habitat for population recovery efforts. Yet roads and stream crossings often increase sediment loads within these streams during the spring thaw and rainfall events and compromise what little habitat remains for these fish. This is why it is important to prevent human activities both within and near critical habita.

Another major issue Dave sees as posing a threat to trout recovery efforts is that some recovery efforts seem to be misplaced or misguided, despite their best intention. At one location where the Forestry Trunk Road crosses Speers Creek a new bridge was constructed with a rock feature below. This rock feature – essentially a manufactured waterfall – replaced a hanging culvert which was previously below the bridge. The culvert limited the passage of hybrid cutthroats upstream into WSCT critical habitat. However, this new rock barrier does not appear to be as tall as would be required to prevent fish from migrating to the upper reaches of Speers Creek – especially during times of greater runoff. The few remaining populations of pure strain trout need their critical habitats protected from introduced species to avoid competition and hybridization which was listed as a threat in the federal recovery strategies for BT, ART, and WSCT. This reconstruction is an example of a recovery effort that doesn't seem to help to recover pure strain WSCT.

We witnessed a second example of poorly implemented recovery efforts at a section of O'Hagan Creek. From Dave's previous experience with this watershed, he had noted this creek has very limited flow even during seasons with increased runoff. The site offered examples of extensive stabilization and habitat construction efforts along the bank, features designed to create artificial habitat and prevent bank erosion. But they are not needed in a stream with such limited flow and would be much better suited to other critical habitat sites than at O'Hagan Creek. Transplanting such large boulders and trees into this area likely requires a great amount of time and money and Dave is concerned this money could be spent more wisely with proper planning and consultation with experts to ensure that recovery efforts actually serve to benefit at-risk trout populations.

My trip with Dave highlighted the urgent need to better understand the cumulative effects of industrial development on fish populations along Alberta's Eastern Slopes. For recovery efforts to be successful, we need to understand the magnitude of the risk posed by our existing human footprint on the landscape and ideally prevent any further degradation in or near trout critical habitats. If the recovery of at-risk species is truly a priority for governments at both the federal and provincial levels, then a rigorous investigation into cumulative effects should be implemented as soon as possible. Recovery efforts – such as those we observed during our trip – need to be better planned in consultation with experts. We don't have the money or time to waste.

One of many tributaries containing WSCT critical habitat along the Atlas Road which passes west of Crowsnest Mountain connecting Coleman to Highway 40. The Atlas road is primarily used for logging and offroad vehicles and crosses numerous creeks along its length. PHOTO: © P. MEINTZER

Waiting for Alberta to Finish its First Two Caribou Sub-regional Land-Use Plans

By Carolyn Campbell, *AWA Conservation Director*

Deadlines for important caribou range plans are approaching. Alberta has committed to adopt enforceable land-use plans, plans detailing how we will pursue economic and social priorities within important wildlife habitat thresholds. The province promised that, by the end of 2021, it will finalize its first two such land-use plans covering the Bistcho caribou range in the northwest, and Cold Lake-Christina caribou ranges in the northeast (see maps).

For the first time, decisions by all land users will be integrated across a significant area of Alberta public lands to reduce human-caused land disturbance. The benefits could be profound for our vital forest and wetland ecosystems and the multiple wildlife species that depend on them. Here's a brief round-up of what has already happened and what we're looking for.

The Goals

Two aspects of 'critical habitat' must be managed in each range for caribou to recover to naturally self-sustaining levels. First, Alberta must achieve and maintain a minimum 65% area of 'undisturbed habitat' in each range, within 50-100 years. Today only 6% of Bistcho and 8% of Cold Lake caribou range is undisturbed. Industry, not wildfire, is responsible for most of that disturbance. The second part is that Alberta must maintain enough good quality older forest and wetlands habitat ('biophysical' habitat) for caribou life cycle needs while disturbed habitat recovers. Thirty-nine percent of Bistcho and 46% of Cold Lake is now considered biophysical habitat.

Alberta only agreed to manage ranges to meet these evidence-based caribou 'critical habitat' requirements when it signed the October 2020 Caribou Conservation Agreement with the federal government. In turn, AWA believes that the 2019 lawsuit Ecojustice filed on behalf of AWA, Athabasca Chipewyan First Nation, Mikisew Cree First Nation, and David Suzuki Foundation motivated Alberta to sign this Agreement. That lawsuit sought a habitat protection order under SARA for northeastern Alberta boreal caribou. We discontinued the lawsuit on Oct. 22, 2020, after receiving word that the Minister of Environment and Climate Change had recommended that Cabinet approve such an order. A day later the federal government indicated that, for the time being, it would pursue the new collaborative agreement with Alberta instead of an order under the *Species at Risk Act*.

The Canada-Alberta Agreement specifies deadlines for Alberta to finalize enforceable range plans, with Bistcho and Cold Lake-Christina due by the end of 2021.

The Approach

Alberta has committed to create enforceable land-use plans for sub-regions that are larger than caribou ranges. In November 2019 it launched three task forces composed of rights holders and stakeholders to make recommendations for three sub-regions: Bistcho Lake, Cold Lake and the Upper Smoky. The Upper Smoky plan is due in 2022. AWA was a member of all these task forces.

Operating on a consensus model, the task forces provided recommendations to support sub-regional plan development. The Cold Lake task force met until April 2020 and provided 41 recommendations, of which 39 had consensus. The Bistcho Lake task force also met until April 2020 and all 29 of its recommendations achieved consensus.

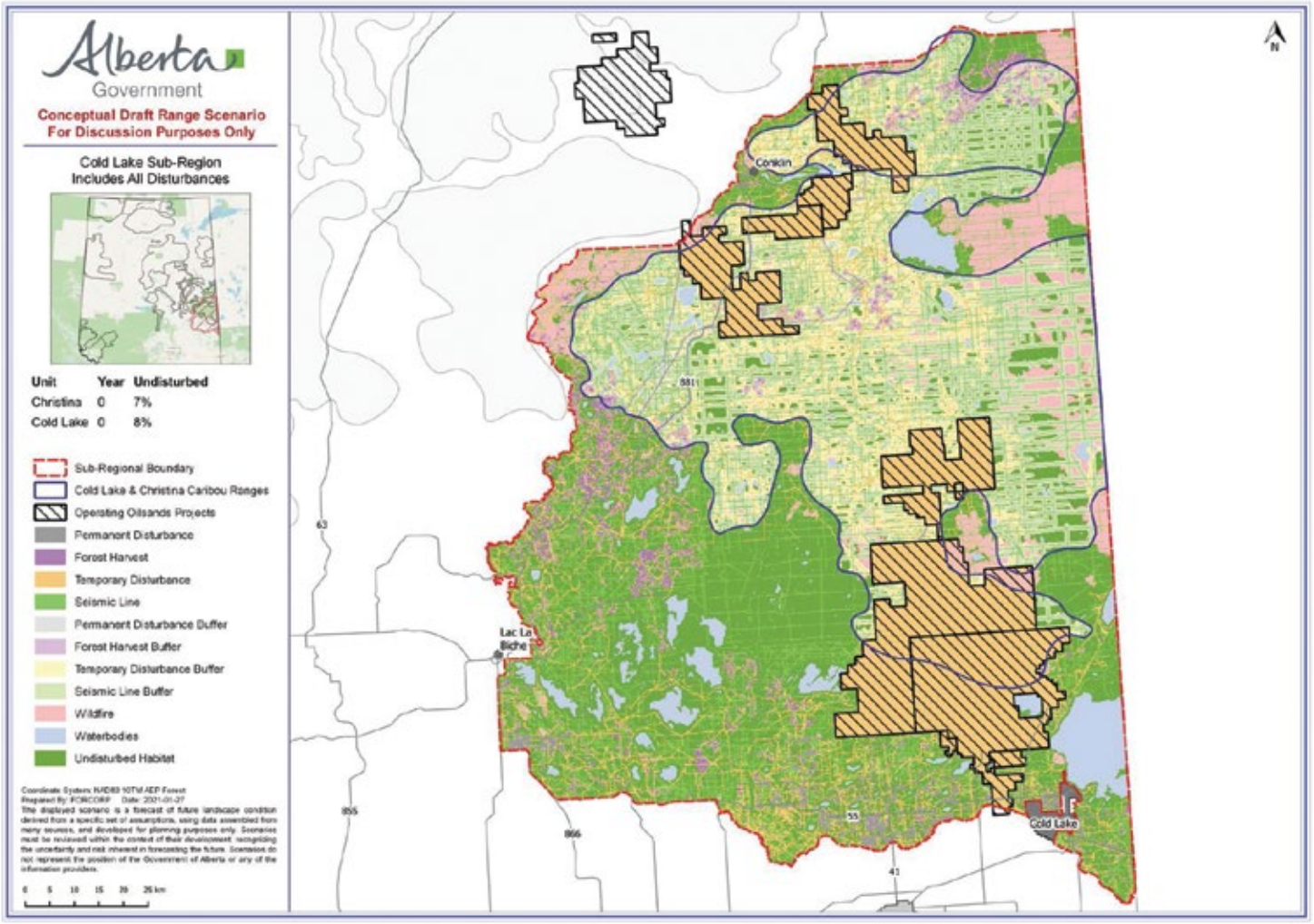
Both Bistcho Lake and Cold Lake draft sub-regional plans were released in March 2021 for public, stakeholder and Indigenous engagement. At that time the Bistcho Lake and Cold Lake task force recommendations became public. As of November 2021, the government had not released final plans.

The draft plans

AWA commented on the draft plans to government and encouraged our members and the general public to provide comments too.

On the positive side, both draft plans reflect a landmark shift towards compulsory integrated land management by all land users to minimize cumulative land disturbance. This management focus covers infrastructure, cutblocks, and all forms of access. Active pipeline corridors and transmission lines will be revegetated to much narrower widths by operators. The plans intend to restore thousands of kilometres of wide seismic lines that have not recovered to conform to the surrounding native vegetation. AWA supports the draft Cold Lake Plan's concept of setting specific wetland disturbance limits in each planning unit to advance biodiversity goals; we were disappointed that Bistcho didn't do this.

AWA believes that three big flaws of the draft plans must be corrected. First, there must be a much stronger commitment to a process of collaborating with Indigenous communities to support their land use goals. To align with consensus statements by both task forces, both plans must commit to a



Only 8% of Cold Lake caribou ranges are considered undisturbed caribou habitat. A year-end deadline is approaching for Alberta to adopt enforceable plans for these ranges that, for the first time, will integrate land-use decisions across significant areas of public lands to maintain and recover wildlife habitat. CREDIT: GOVERNMENT OF ALBERTA, 2021.

process to identify opportunities to establish conservation areas important for Indigenous people. In the Bistcho Lake area, AWA strongly believes that this process should produce an Indigenous protected and conserved area (IPCA).

Second, in the crucial first decade, neither plan addresses urgently enough the need to restore seismic lines and temporary roads. If actions are taken over the next ten years to restore significant amounts of seismic and other low value legacy features it will set these features on a trajectory to reach 'undisturbed' status some 40 years from now. Deadlines for removing oil and gas infrastructure and short-term roads are also missing. Comprehensive mandatory actions and funding arrangements are urgently needed in the next five years to set this course. Instead, the plans vaguely assume the work will be done over 40 years. As well, forestry impacts grow rather than shrink in the first decades. Too many hard decisions still seem very far off.

Related to the above problems, the map of Bistcho Lake's draft Access Management Plan seems to anticipate building new roads in all of the many planning units, including in areas that are largely intact now and provide important wildlife habitat connectivity. Not a single planning unit is dedicated to long-term legal protection and roadless areas. The permafrost soils and extensive inter-connected peat wetlands of this northern boreal landscape are highly sensitive to disturbance and difficult to restore. the Bistcho plan should recognize the need to preserve large intact landscapes.

Third, the plans assume zero new wildfire, in sub-regions that experience frequent natural fire disturbance. Today both Bistcho and Cold Lake ranges are about 20% disturbed by wildfire. Without considering wildfire the plans assume that the undisturbed habitat thresholds can be met sooner than is likely to be the case. When only industrial and road disturbance is considered, the Bistcho caribou range is projected to reach roughly 80% undisturbed status in eight decades. Without considering the inevitability of wildfire, the Cold Lake-Christina range will reach the 65% undisturbed threshold in 100 years. This severely over-estimates future caribou habitat availability. While the draft documents are upfront about this assumption, it's still unacceptable. Anticipated wildfire should be included and anthropogenic disturbance must be managed accordingly.

As we anticipate the release of these finalized sub-regional plans, AWA will continue to hold Alberta and Canada to their commitments to ensure caribou ranges are at last responsibly managed.

Monitoring Efforts to Recover Athabasca Rainbows in Apetowun Creek: Year Two

By Phillip Meintzer, *AWA Conservation Specialist*

The day started before dawn, waking to the sound of my alarm at 5:30 AM in a hotel bed in Hinton Alberta on a dark September morning. I was in Hinton to visit the site of the Obed Mountain coal mine disaster – a tailings pond failure which saw 670,000 cubic metres of coal wastewater tear down the mountainside on October 31st, 2013. It destroyed much of Apetowun Creek and its neighbouring vegetation in the process. I was visiting as a follow-up trip for Alberta Wilderness Association (AWA), as we had visited the site during the summer of 2020, just over a year prior to monitor the rehabilitation efforts at Apetowun Creek following the legal settlement against Prairie Mines and Royalty who pleaded guilty in 2017. The restoration efforts are being led by a team from Hatfield Consultants and I met with two of their team members in the hotel lobby at 6:00 AM.

Joanna Skrajny and Ian Urquhart conducted our 2020 site visit. They received a tour of the Obed mine site that included observations of the dewatering and reconstruction along the length of Apetowun Creek, as well as electrofishing, tagging, and fin-clipping of rainbow trout along the waterway. The electrofishing efforts hoped to catch pure strain Athabasca rainbow trout (ART) – a genetically distinct subpopulation of rainbows native to Alberta, with the goal of establishing a population of 100 individuals (ideally 50 breeding pairs) in an upper segment of Apetowun Creek to aid in their recovery. As of 2019, Athabasca rainbow trout are listed as Endangered under the *Species at Risk Act* (SARA). In September 2020, Fisheries and Oceans Canada (DFO) finally released their Recovery Strategy for this distinct subpopulation of rainbow trout in Alberta. The Recovery Strategy identified hybridization with species of non-native trout as a major risk to Athabasca rainbow recovery. Therefore, the Apetowun Creek restoration efforts seek to provide these trout with a habitat to call their own in the upper reaches of the creek, segregated from other trout through the use of an impassable barrier. Rainbow trout were collected in 2020, tagged for identification in future surveys, and fin clips were sampled for genetic analysis to determine which tagged fish correspond to true pure strain Athabasca rainbow trout. The goal of my follow-up visit was to check in on the reclamation efforts along the creek, to observe subsequent electrofishing for the recapture of those pure strain individuals caught in 2020, and to witness the relocation to their new private residence.

We departed our hotel in Hinton shortly after 6:15, coffee in hand, heading east for 24 kilometres, before turning at Obed Mountain Road which would take us downhill and then back uphill another 10 kilometres to reach the mine site and parking area near the summit of Obed Mountain. The drive was dark and heavy with fog, but the roads were empty and it made for a swift trip from Hinton to the turn off for the mine. I hadn't anticipated the need for a vehicle with off road capabilities, which made traversing Obed Mountain Road in my rent-

Dave Evans and Alex Kamprath electrofishing Apetowun Creek…and part of the day's catch PHOTO: © P. MEINTZER

al Camry a bit of a thrill. Wet, slippery sand would is the only way to describe the road quality that morning and I was concerned I wouldn't even make it to the site as my tires started spinning out as the Toyota crawled up the mountain at five kilometres per hour – but I got there in the end. The sun was beginning to rise in a vibrant pink as the Hatfield duo (Dave Evans and Alex Kamprath – a former peer of mine during our undergraduate days) prepared their electrofishing gear and packed up their truck and "side-by-side" – an off road vehicle used to navigate the restoration area and carry their equipment between locations. Dave and Alex gave me a thorough safety walkthrough for our planned activities as well as more general information for safety at the mine before we departed for the staging area where we would begin our fishing.

After a quick drive along a gravel resource road, we arrived at the staging area for the morning's activities. At a small pond known as Sediment Trap 2B, the three of us donned our waders while enjoying the company of a beaver which was navigating the pond and slapping its tail on the surface of the water. Dave and Alex picked a section of the creek known as APC 9 which they had hoped would lead to a better catch of tagged pure strain ART than their previous efforts had yielded, and we headed off downstream so that we could work our way upstream and end our sweep back at the staging area for fish processing. Prior to my arrival, the two of them had caught 34 of the 100 tagged individuals intended for capture and relocation and they hoped that this new segment of creek and my presence might bring good luck to their day.

Coming from a background in marine fisheries, most of my previous experience was at-sea on commercial fishing boats and not in waders in shallow freshwater streams. This meant it was my first experience with electrofishing – a process by which fish get stunned by a quick shock that immobilizes them for anywhere from 10-seconds to one minute depending on their size/maturity and the distance from the source of the shock. Alex and Dave explained to me that the electrofisher is typically set anywhere between 200-250V, and that there's no guarantee that the fisher will stun all fish in a given vicinity during a single sweep. Some fish can avoid the stun or the stun just might not reach all fish in a given area. As our electrofishing was taking place in a moving stream, I quickly learned that to be an effective electrofisher you need to move quickly, especially if you're the person in charge of netting the fish. Typically, one person will be in charge of stunning, while another uses a net to catch any individuals that float to the surface while incapacitated. Moving quickly is essential otherwise even stunned fish can get away from you as they drift downstream with the current. On this day, Dave was in charge of wearing the electrofishing equipment while Alex was on netting duty. I followed along the banks of the stream with a cooler for the safe storage and transportation of any caught fish and to keep an eye out for predators or ungulates we might encounter along the way. Electrofishing began at 8:34 AM and we started our travels upstream.

Over the course of two hours, we traversed the length of APC 9 from our starting point and back to the staging area, covering a distance of roughly 350 metres of the creek and catching 28 fish in total – a good haul by Alex and Dave's standards for the length of time we spent fishing. All 28 of those fish ended up in the cooler which I was responsible for safekeeping during our travels back to the truck for processing. My safekeeping during transit role made me nervous. It felt like far too great of a responsibility to shoulder for such an important recovery process – any individual lost to my mistreatment would only put this species further at risk to extirpation. Upon our return to the truck and side-by-side, all of the caught fish were placed into a much larger cooler, with fresh stream water and multiple aerators to ensure ample oxygenation for the fish inside. On such a calm morning, the woods around the staging area were alive with the buzz of aerators as processing was about to begin.

Processing consisted of a series of measurements including fork-length, weight, and maturity code (estimated from both length and weight), which were all recorded in a logbook along with species. Species was determined visually for any non-rainbow trout captured – such as brook trout, bull trout, or sculpins. But all rainbow trout had to be scanned for the presence of a PIT tag which were inserted into the rainbows caught

Dave and Alex preparing to take the vital statistics of….this Athabasca Rainbow Trout PHOTO: © P. MEINTZER

during the previous summer's electrofishing. Scanning for PIT tags requires a specially designed reader, shaped like a wand with a loop at the end - that somewhat resembles a high-tech version of a child's bubble toy. The reader is shaped to allow users to pass any fish through the loop to check for the presence of PIT tags. If a tag is present, the wand gives off an audible beep. All rainbow trout captured in 2020 were subsequently tagged, however not every tagged fish was guaranteed to be a pure strain ART. Following genetic analysis, tag IDs were assigned a percentage of pure strain DNA, which was recorded in a spreadsheet, which Alex would refer to as she processed each fish. A beep would signal to Alex that she needed to reference her database, where she could determine whether a fish was truly pure strain and should be kept for relocation in the upper portion of the creek or released back into the stream it was taken from initially. Despite our successful haul of fish, only two of the 28 fish were guaranteed pure strain Athabasca rainbow trout – bringing the yearly total to 36 of the 100 needed for even a slim chance at recovery according to Dave.

Once all 28 fish were processed and sorted into their respective coolers, Dave released the non-ART back into the stream and then we departed for an upper reach of Apetowun Creek to release our two pure strain Athabascas into their new home. This gave me the opportunity to observe the reclamation efforts at another part of the watershed – a stretch known as APC 5. I had seen photos of this section of the creek from our previous visit in 2020, so it was encouraging to see just how much of the vegetation had already started to regrow along the length of the banks. Dave commented that he was impressed by the amount of regrowth he was seeing along the whole length of the reconstruction area. But APC 5 in particular stood out for him as he had visited earlier in the summer and it wasn't nearly as grown over then as it was during my visit. Dave released our two Athabasca rainbow trout at a bend in the creek under the cover of a reconstructed bank and checked to ensure that both fish seemed to be in good condition after their difficult morning of unwillingly participating in human exploits. Now all we can do is wait and hope that, by providing these fish with their own habitat - away from the threats of hybridization and competition with other species, they will have a better shot at recovery.

One of the many concerns with the recovery of Athabasca rainbow trout as well as other at-risk fish species is that severely depleted populations (relative to historical abundances) are known to have extreme difficulties recovering – as seen with the collapse of Atlantic cod in eastern Canada (1). The goal of transplanting and segregating 100 ART into the upper reaches of Apetowun Creek might help avoid the hybridization issue with introduced trout but it's no guarantee this population of fish will grow substantially or ever reach historical numbers - especially if other threats aren't managed appropriately. The cumulative effects of industrial development on Alberta's landscape harms our populations of native fish, especially our three species of native trout (ART, Bull Trout, and Westslope Cutthroat Trout) classified by SARA as either Threatened or Endangered. Logging, fossil-fuel energy exploitation, and the linear footprint associated with these industries (e.g., roads or seismic lines) have significant impacts on the recovery of these imperiled fish species even without disaster events like the Obed spill. Even if these reclamation efforts at Apetowun Creek are successful, the bigger issue of fish recovery in our province still needs to be addressed in a meaningful way to ensure that all of this effort at Apetowun doesn't go to waste.

Robert Frost
"A Winter Eden"

A winter garden in an alder swamp,
Where conies now come out to sun and romp,
As near a paradise as it can be
And not melt snow or start a dormant tree.

It lifts existence on a plane of snow
One level higher than the earth below,
One level nearer heaven overhead,
And last year's berries shining scarlet red.

It lifts a gaunt luxuriating beast
Where he can stretch and hold his highest feat
On some wild apple tree's young tender bark,
What well may prove the year's high girdle mark.

So near to paradise all pairing ends:
Here loveless birds now flock as winter friends,
Content with bud-inspecting. They presume
To say which buds are leaf and which are bloom.

A feather-hammer gives a double knock.
This Eden day is done at two o'clock.
An hour of winter day might seem too short
To make it worth life's while to wake and sport

Analysis and Actions:

Reflecting on Climate Change Developments in 2021

By Ian Urquhart, *Editor and Executive Director*

This article began as a straightforward review of what I believe to be the most important climate change document the public should read in 2021 – the August 2021 Summary for Policymakers that prefaced the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). It's become more than that and is now a reflection on the climate change analysis and policy making we've seen in the last half of this year. The reflection begins with the Summary's release in August and ends with the Glasgow Climate Pact. This was the agreement reached at the conclusion of the 26th conference of the parties (COP) that signed the United Nations Framework Convention on Climate Change (UNFCCC) more than a generation ago, in 1992.

What is the IPCC? How Has Its Language about Climate Changed From 1990 to Now

For years climate change figured importantly in my teaching about international and Canadian environmental politics. My conclusion about the "must read" character of the 2021 Summary for Policymakers is based on that experience. In the classroom, I told my students there were good reasons to take the analyses and conclusions of the IPCC seriously.

Before getting to those reasons I'll offer a few words about the IPCC for those unfamiliar with the history of this United Nations institution. Given the messaging in today's IPCC analyses and conclusions, there's some irony in its creation. In 1979 the United Nations' World Meteorological Organization held the First World Climate Change Conference. Approximately 350 specialists from the natural and social science worlds gathered in Geneva for this conference. The conference ended with a call to investigate urgently climate knowledge and "to foresee and prevent potential man-made changes in climate that might be adverse to the well-being of humanity."

The IPCC was fathered by American concerns about what this agenda could mean for economic and corporate activities. The Bush Administration worried that quite a small number of eminent scientists from the International Council of Scientific Unions would produce analyses calling for important restrictions on economic activity. To try to minimize this risk the United States urged the establishment of a much larger, open-ended intergovernmental panel to assess climate change science. This panel is the IPCC and it was born in 1988. It is composed of 195 governments. Its Working Groups draw on the expertise of hundreds, thousands of scientists.

Involving hundreds, thousands, of scientists in writing and assessing the reports IPCC assessment reports is one reason I told my students they should be confident in the credibility of the IPCC's work. There may be other examples of where so many experts focus their attention on a set of related subjects. But, if so, they're unlikely to be many of them. With extensive scientific comment should come greater confidence in their conclusions.

A second reason was at least as important. This was the refusal of the scientists to rush to judgment in their assessment reports. Their analytical reach didn't go beyond what the evidence available to them suggested. Their assessments were careful, measured. This is seen very well through comparing the language used over time, as the scientific community produced and assessed more climate change related data. And, as we've moved from the first assessment report in 1990 through to the sixth one of 2021 the careful, measured language of those assessments has become more and more certain about the causes of climate change. We are primarily responsible.

In 1990 the IPCC wasn't prepared to say anything definitive about the human contribution to climate change. It left the door open to the possibility that the amount of warming the climate models appeared to show could have been due to natural variability. In 1995, after analyzing more data, the IPCC said the evidence suggested there was "a discernible human influence" on the climate record. However, it didn't conclude human activity was the most important influence on global climate, just that our influence was discernible.

In 2001, the IPCC's assessment was more certain of our responsibility. But, even then, it was cautious about the amount of influence it would grant to our activities. It wrote: "There is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities." By the time of the fourth assessment report in 2007 the cumulative research record left little doubt where most of the responsibility for climate change rested. Our greenhouse gas emissions were "very likely" responsible for "most of the observed increase" in global average temperatures in the last half of the

Twentieth Century. It was "extremely unlikely" that the recent record could be explained without considering those emissions. As more and more evidence was gathered, as more and more scientists evaluated the data, the human responsibility for climate change evolved from a possibility to a near certainty.

Some eminent contributors to our knowledge and awareness of climate change likely see this cautiousness as fulfilling the American desire to protect business. Tim Flannery, for example, sees the IPCC's assessments as "lowest-common-denominator science." The IPCC's consensus decision-making model has given too much influence over the years to governments in league with the fossil-fuel industry. "If the IPCC says something," Flannery wrote in 2005, "you had better believe it – and then allow for the likelihood that things are far worse than it says they are."

So, what is the IPCC saying now? The language of this year's sixth assessment report is even more categorical.

The Current Climate

Have humans warmed the planet? There is no hedging in the IPCC's 2021 answer: "It is unequivocal that human influence has warmed the atmosphere, ocean and land." Increases in greenhouse gas (GHG) concentrations in the atmosphere since the 18th Century "are unequivocally caused by human activities." And, as the Chart below shows, we are warming the climate at an "unprecedented" rate – unprecedented at least in the last 2000 years!

What is responsible for the retreat of glaciers, Arctic sea ice, and the melting of the Greenland Ice Sheet? The IPCC concludes: "Human influence is *very likely* the main driver of the global retreat of glaciers since the 1990s and the decrease in Arctic sea ice between 1979-1988 and 2010-2019…" (emphasis in the original; all italicized text was emphasized by the IPCC's authors) It is also *very likely* we have contributed to the melting in Greenland over the past 20 years.

How severe is this retreat? In the last decade, the IPPC concludes with *high confidence*, the annual average level of Arctic sea ice was at the lowest level it's been since 1850. With *medium confidence*, the IPCC offered the following two conclusions. Arctic sea ice in the late summer was smaller than at any point in the previous 1,000 years; the global retreat of glaciers since the 1950s, like the rate of global warming, is unprecedented at least in the last 2,000 years.

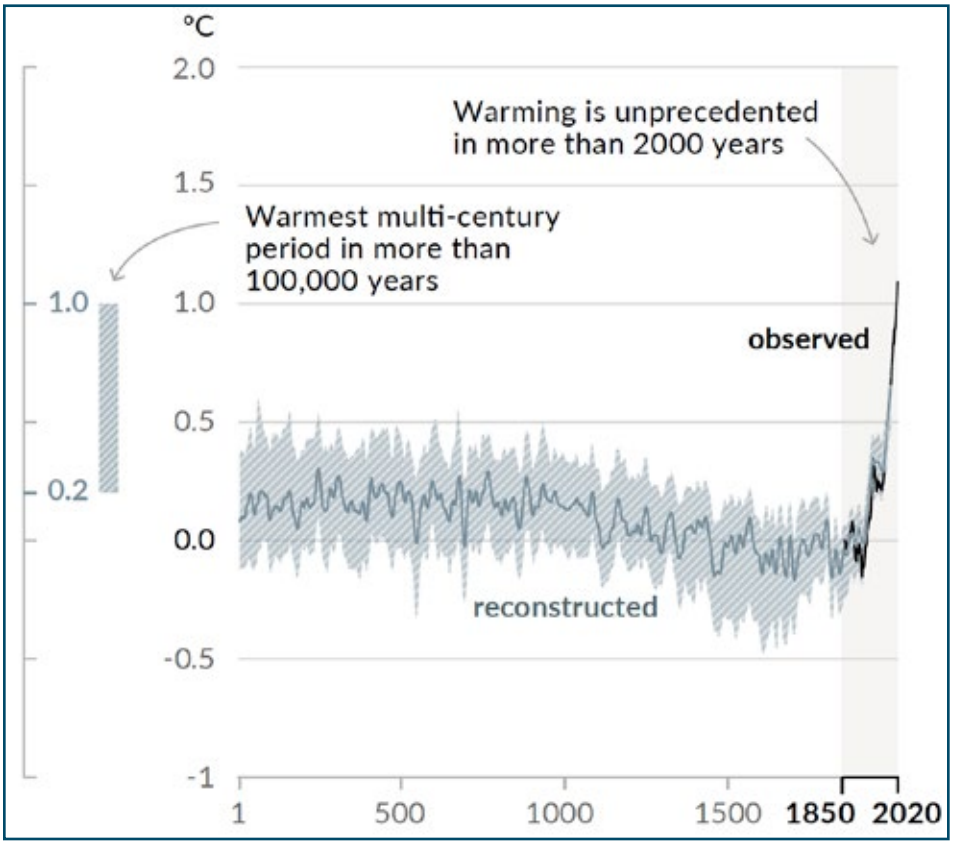


Figure SPM.1(a) of Climate Change 2021: The Physical Science Basis shows that the speed and scale of warming since 1850 is unprecedented in over the last 2000 years.

And what about the oceans? "It is *virtually certain* that the global upper ocean (0-700 m) has warmed since the 1970s and *extremely likely* that human influence is the main driver. It is *virtually certain* that human-caused CO_2 emissions are the main driver of current global acidification of the surface open ocean."

With *high confidence*, the sixth assessment reports that the global mean sea level has risen more rapidly since the start of the Twentieth Century than in any earlier century in the last 3,000 years, at least.

With respect to the state of the climate currently the sixth assessment report has much more to say. None of it is soothing.

A Lost World

One of the most disturbing aspects of the summary for policymakers found in the latest assessment report is the section on possible climate futures.

Barring a catastrophic global cooling event, the world we see outside our windows today is already lost. The possible climate futures section of the summary presents several climate change scenarios, each one based on different assumptions about the trajectories GHG and CO_2 emissions will take in the remainder of this century.

Whether the globe follows a low or high GHG emissions scenario, the world's surface temperatures will continue to increase until at least the middle of the Twenty-first Century. Here the ambitions of the 2015 Paris agreement on climate change are worth considering. That much-celebrated agreement put numbers on the goal of reducing the risks and impacts associated with human-caused climate change. It aspired to hold the average global temperature increase "to well below 2° C above pre-industrial levels and (to) pursuing efforts to limit the temperature increase to 1.5° C above pre-industrial levels."

"Global warming of 1.5° C and 2° C will be

Celebrating the Paris Agreement in December 2015, an Agreement that is no closer to being realized today than it was in 2015. CREDIT: UNCLIMATECHANGE, CREATIVE COMMONS ATTRIBUTION 2.0 GENERIC (CC BY 2.0) LICENSE.

exceeded during the 21st century," says the report, "unless deep reductions in CO_2 and other greenhouse gas emissions occur in the coming decades." In the IPCC's intermediate GHG increase scenario, the last twenty years of this century are likely to be characterized by an increase of 2.1° C to 3.5° C relative to temperatures in the last half of the Nineteenth Century. With *medium confidence* the IPCC states that the last time global temperatures were 2.5° C higher than the 1850-1900 period was…over three MILLION years ago.

We might take a small dose of encouragement from the suggestion that under the very low GHG emissions scenario it is "just," in the IPCC's words, "more likely than not" that the 1.5° C global temperature increase will be exceeded by 2040.

Is today's world lost? Yes, our new world is one where the damaging impacts of climate change are expected to increase "in direct relation to increasing global warming." We can expect to see increases in the frequency and intensity of heatwaves, droughts, tropical cyclones, the shrinking of Arctic sea ice, and heavy precipitation.

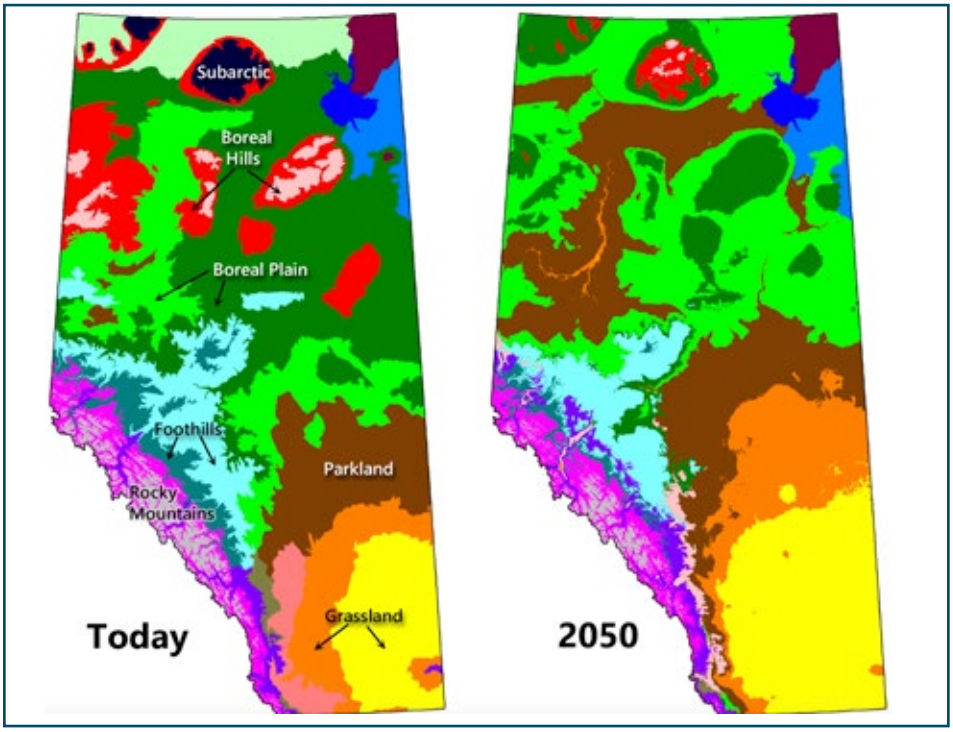
Furthermore, the report concludes that many of the changes caused by past and future GHG emissions "are irreversible for centuries to millenia." This is especially likely for the oceans, ice sheets, and global sea level. It is *virtually certain*, notes the report, that the Greenland Ice Sheet will continue to lose ice throughout this century. Such certainty also is attached to the report's conclusions about rising global sea levels in this century.

And What About Alberta?

A regional or local analysis of how climate change will affect Alberta over the medium to longer term is found in the Prairie Provinces chapter in *Canada in a Changing Climate: Regional Perspectives*. Here I focus on only one theme of that chapter – the shifting, transformation, and likely disappearance of ecosystems.

A warmer future likely will see Alberta's grasslands ecosystem expand significantly. Both the mixedgrass/fescue and dry mixedgrass subregions are predicted to expand northward. The mixedgrass/fescue's northward shift will come at the expense of the central parkwood subregion. The dry mixedgrass may nearly double in size by 2050 as it moves north and west to cover lands now home to the mixedgrass/fescue environment.

The most dramatic change may occur in the Rocky Mountains and the boreal natural region. In the Rockies, the alpine subregion seems at risk of nearly disappearing altogether by the middle of this century. Species of flora and fauna that must have alpine conditions to survive likely will be extirpated from the Rockies by the end of this century. They will disappear from Alberta's landscape. The boreal subarctic subregion is likely to disappear altogether; virtually all of the boreal highlands (shaded light pink) will disappear. The lower boreal highlands subregion is expected to shrink dramatically. And, the cen-



Temperature changes according to an intermediate climate change scenario are likely to change Alberta's distribution of natural regions. It will take decades for the actual ecological transitions to occur. Source: Nature Alberta Magazine, Summer 2021. PHOTO: © R. SCHNEIDER

tral mixedwood boreal subregion, the largest ecosystem in Alberta today, loses that status as it transitions into the dry mixedwood (boreal) and central parkwood (parkland) subregions. These changes are expected to take place in a millisecond of geological time.

It's important to note that, as Richard Schneider points out in *Nature Alberta Magazine*, as quickly as these ecological transitions will take place they will not appear in a blink of an eye. It will take decades for the ecosystem changes to catch up to the increases in temperature we can expect.

COP 26 in Glasgow: More Than "Blah, Blah, Blah?"

Between October 31st and November 13th the Conference of the Parties to the United Nations Framework Convention on Climate Change met for the 26th time. Alok Sharma, the British Member of Parliament who was the President of the Glasgow Conference proclaimed the Conference to be an important success. He described the Glasgow Climate Pact as "a historic achievement. We kept 1.5 in reach." Teenage climate change campaigner Greta Thunberg wasn't impressed; she harshly characterized COP 26 as "blah, blah, blah."

The smart money favours Thunberg's view. On the one hand, Sharma is right – the 1.5° C objective remains in reach and will be until the day when the global average increase exceeds that value. But, collectively governments do not have the world on a path where it can be realized. If governments meet what they've pledged to so far, the IPCC estimates we will experience an increase of 2.4° C over the course of this century. This is a scenario where the much-celebrated promises made in Paris in 2015 won't be honoured. The Glasgow Climate Pact, despite recognizing the urgent need for more action, kicked that can down the road again. The Pact "invites" Parties, "urges" Parties to do more. In that vein, Parties are asked to come to the next COP with strengthened plans. We've heard this song before.

It's still hard to believe that, 26 years after the COP first met in Bonn, the fact coal is finally mentioned in a COP document is regarded by some as a major achievement. Such a delay supports well Flannery's point about how the IPCC's consensus decision-making style dilutes serious action. And, his point is reinforced by the semantic gamesmanship surrounding how the obvious damage to the current climate from burning coal would be described in the Glasgow Climate Pact. To call for a "phase out" of coal was a bridge too far for some coal-producing and coal-burning nations. Instead, India and China, the two countries that together burn two-thirds of the world's coal pushed back and succeeded in replacing the call for a coal phase out with one to "phase down" coal.

A Reason to Hope?

At Glasgow we saw the largest gap yet emerge between the IPCC's scientific assessment of the current and future climates and the actions of governments. This may provide a reason to hope we can avoid the worst impacts of our changing climate as we move deeper into this century. The science, natural and social alike, leave little to no doubt about what awaits us if we don't finally act decisively to address this growing emergency. This knowledge is an important political resource we can expect to see used domestically and internationally to try to secure the dramatic changes needed to rescue us from the dangerously warmer planet we are stumbling towards.

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Scottish primary school children plead for action at COP 26 in Glasgow. CREDIT: UNCLIMATECHANGE, KIARA WORTH, CREATIVE COMMONS ATTRIBUTION 2.0 GENERIC (CC BY 2.0) LICENSE.

Greenhouse gas emissions must peak within 4 years, says leaked UN report

By Fiona Harvey and Giles Tremlett,
The Guardian, August 12, 2021, reprinted with permission

Global greenhouse gas emissions must peak in the next four years, coal and gas-fired power plants must close in the next decade and lifestyle and behavioural changes will be needed to avoid climate breakdown, according to the leaked draft of a report from the world's leading authority on climate science.

Rich people in every country are overwhelmingly more responsible for global heating than the poor, with SUVs and meat-eating singled out for blame, and the high-carbon basis for future economic growth is also questioned.

The leak is from the forthcoming third part of the landmark report by the Intergovernmental Panel on Climate Change, the first part of which was published on Monday, warning of unprecedented changes to the climate, some of them irreversible. The document, called the sixth assessment report, is divided into three parts: the physical science of climate change; the impacts and ways of reducing human influence on the climate.

Part three is not scheduled to be released before next March, but a small group of scientists decided to leak the draft via the Spanish branch of Scientist Rebellion, an offshoot of the Extinction Rebellion movement. It was first published by the journalist Juan Bordera in the Spanish online magazine CTXT.

Bordera told the Guardian that the leak reflected the concern of some of those involved in drawing up the document that their conclusions could be watered down before publication in 2022. Governments have the right to make changes to the "summary for policymakers".

The top 10% of emitters globally, who are the wealthiest 10%, contribute between 36 and 45% of emissions, which is 10 times as much as the poorest 10%, who are responsible for only about three to 5%, the report finds. "The consumption patterns of higher income consumers are associated with large carbon footprints. Top emitters dominate emissions in key sectors, for example the top 1% account for 50% of emissions from aviation," the summary says.

The report underlines the lifestyle changes that will be necessary, particularly in rich countries and among the wealthy globally. Refraining from over-heating or over-cooling homes, walking and cycling, cutting air travel and using energy-consuming appliances less can all contribute significantly to the reductions in emissions needed, the report finds.

Eating patterns in many parts of the rich world will also need to change. "A shift to diets with a higher share of plant-based protein in regions with excess consumption of calories and animal-source food can lead to substantial reductions in emissions, while also providing health benefits Plant-based diets can reduce emissions by up to 50% compared to the average emission intensive western diet," the report says. Providing modern energy to all those who currently lack it (800m people have no access to electricity) would have a "negligible" effect on increasing emissions, the report notes.

Cutting emissions in the next decade will be crucial to any hope of holding global heating within 1.5° C of pre-industrial levels, beyond which the impacts of climate breakdown will cause widespread devastation. "Weaker near-term action would place limiting warming to these levels out of reach, as it would entail assumptions about subsequent accelerated policy development and technology development and deployment, inconsistent with evidence and projections in the assessed literature," the report warns.

The report reaffirms the need to halve emissions in the next decade to stay within 1.5° C and reach net zero emissions by 2050.

The investment needed to shift the global economy to a low-carbon footing is also missing. Current investment falls below what is needed "by a factor of five", even to hold warming to the higher limit of 2° C, according to the report. About $546 bn went towards cutting greenhouse gases and building resilience to the impacts of the climate crisis in 2018.

"Existing and planned infrastructure and investments, institutional inertia and a social bias towards the status quo are leading to a risk of locking in future emissions that may be costly or difficult to abate," the scientists say.

Stranded assets will be a growing problem, as coal-fired and gas power plants with working lives usually measured in decades will have to be decommissioned within nine to 12 years of construction, the report finds. The scientists echo the recent advice from the International Energy Agency that no new fossil fuel development can take place if the world is to stay within 1.5° C of heating.

"The combined economic impacts of stranded fossil fuel resources and capital

could amount to trillions of dollars," the report says. This risk could be reduced by shifting investment to low carbon goods and services.

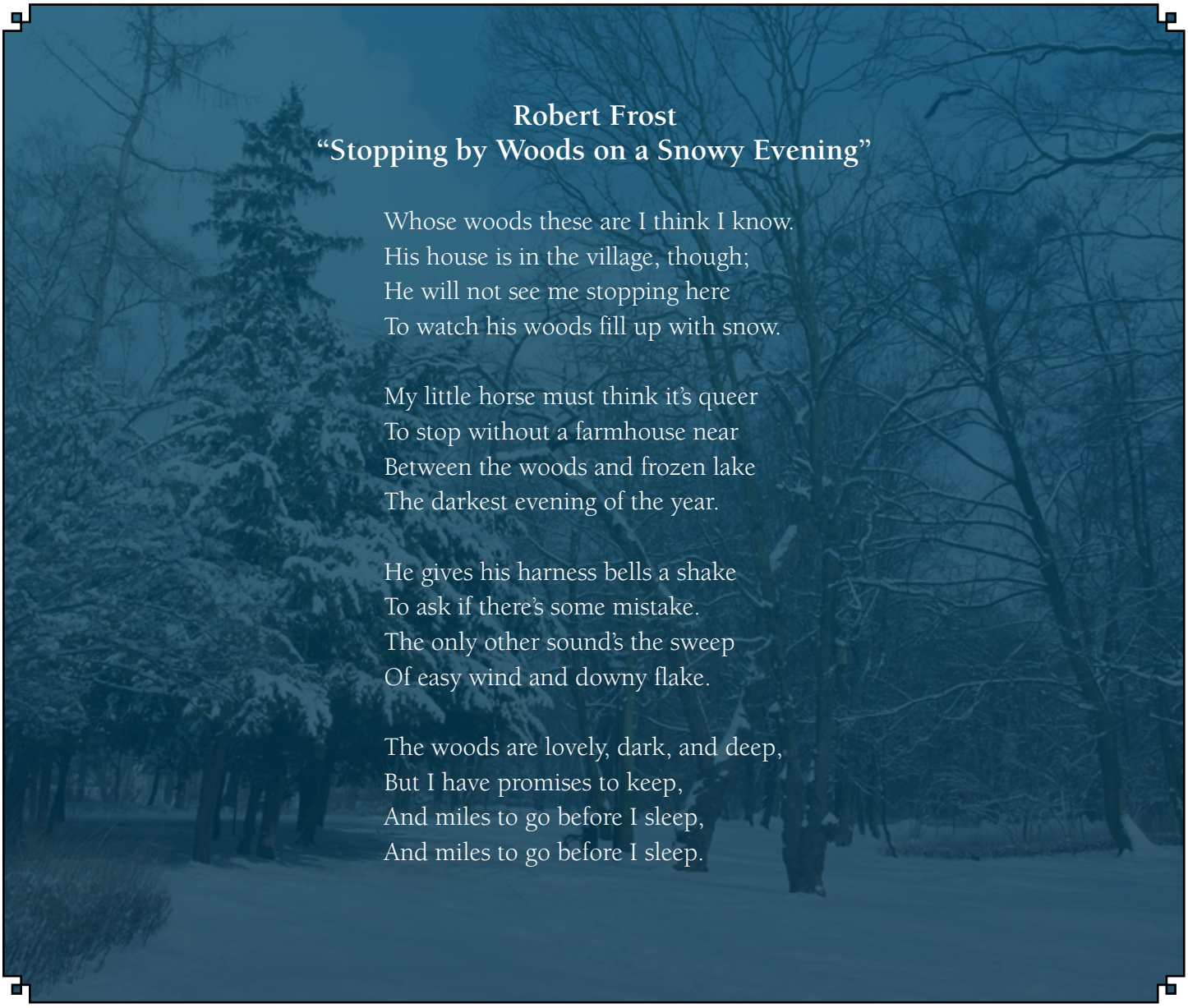
Technology to capture and store carbon dioxide has not progressed rapidly enough to play a major role yet, the report also finds, but technologies to remove carbon dioxide from the atmosphere would almost certainly be needed to hold heating to 1.5° C.

There are some causes for optimism, the report notes. Solar and wind energy and battery technology are now far cheaper, thanks to policies that have encouraged their use. Cutting methane emissions would also be a major contributor to dampening temperature rises.

Taking greater care of forests and land as important carbon sinks would also help to limit temperature rises, but must not be over-relied on. This comes at relatively low cost but cannot compensate for slow emissions reduction in other sectors, the report says.

CTXT, the Spanish publication that leaked the draft, said it showed that the global economy must be shifted rapidly away from a reliance on conventional GDP growth, but that the report underplays this. "The essential radical change in an economic system whose perverse operation of accumulation and reproduction of capital in perpetuity has brought us to the current critical point is not clearly mentioned," CTXT wrote.

The IPCC said it did not comment on leaks, and the purpose of the drafting process was to give the scientists time and peace to develop their assessment without external comment. Jonathan Lynn, head of communications at the IPCC, said: "Much of the text cited here – apparently from the first version of the summary for policymakers in the Working Group III second order draft circulated to governments and expert reviewers in January – has already changed in the latest internal draft of the summary for policymakers now being reviewed by authors."



Robert Frost
"Stopping by Woods on a Snowy Evening"

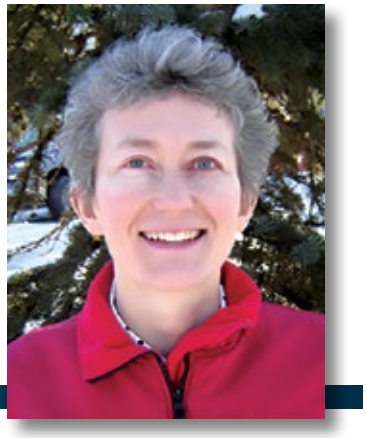
Whose woods these are I think I know.
His house is in the village, though;
He will not see me stopping here
To watch his woods fill up with snow.

My little horse must think it's queer
To stop without a farmhouse near
Between the woods and frozen lake
The darkest evening of the year.

He gives his harness bells a shake
To ask if there's some mistake.
The only other sound's the sweep
Of easy wind and downy flake.

The woods are lovely, dark, and deep,
But I have promises to keep,
And miles to go before I sleep,
And miles to go before I sleep.

West Fraser's Proposed Moon Creek Logging – The Worst Place in Alberta to Clearcut?



Carolyn Campbell, ***AWA Conservation Director***

In late July 2021 AWA learned that West Fraser Hinton was proposing imminent clearcuts in a particularly inappropriate area of west central Alberta, near the town of Grande Cache. The proposed access roads, water crossings, and roughly 2,660 hectares of cutblocks that will extend for kilometres on both sides of Moon Creek, will:

- destroy critical habitat of Threatened mountain caribou;
- overlap and threaten critical habitat of Endangered Athabasca rainbow trout; and
- run right to the borders of the iconic Willmore Wilderness Area.

If Alberta practiced an environmentally sustainable approach to forestry management, any one of these elements would disqualify this plan.

Indigenous and Community Concerns

West Fraser told the trappers whose Fur Management Area overlaps Moon Creek that a new bridge across the Creek would be built starting mid-summer 2021, followed by logging operations starting in September. We greatly appreciate the stewardship of these trappers, who informed AWA and many other people and groups about these plans. AWA issued action alerts, several joint news releases, and discussed our concerns with Alberta and federal regulators. The Mountain Metis Nation Association, representing a local Indigenous community, has also publicly opposed the logging plan and is preparing a legal injunction request. These efforts appear to have slowed the approval process. However, we believe these old forest stands remain at high risk.

Caribou and Wolf Impacts

The 'A La Peche' caribou population, whose range includes Moon Creek, is the 'mountain' type of woodland caribou. To survive, they need to migrate into secure winter range in their foothills forests. The winter range should be at least 65% undisturbed to sustain mountain caribou from intolerable predation. However, Alberta has not responsibly managed cumulative industrial impacts to these forests. As a result, the A La Peche caribou winter range was only 12% undisturbed as of 2017 and it's likely in worse shape now (updated disturbance measures aren't public). As well, these caribou need adequate amounts of forest that is at least 80 years old to meet their life cycle needs for food, shelter, and successful reproduction. The Moon Creek area has some of the oldest and most intact tree stands in the region, including trees over 100 years old.

An intense provincial government wolf cull, conducted every winter since 2005/06, has enabled A La Peche caribou to survive in this highly fragmented landscape. This dire measure can only be justified if Alberta makes land-use decisions that maintain and restore good habitat so the caribou population can become naturally self-sustaining as soon as possible.

Only six percent of West Fraser Hinton's total forestry tenure area overlaps with the ranges of A La Peche caribou and adjacent Little Smoky caribou. Ninety-nine percent of Little Smoky critical habitat was disturbed as of 2017. West Fraser is not required to log Moon Creek and has many other alternative logging sites outside these caribou ranges. AWA believes it is simply unethical to authorize more West Fraser clearcuts in A La Peche or Little Smoky ranges until a caribou range plan that complies with the federal *Species at Risk Act* (SARA) is in place.

Endangered Native Fish Impacts

The Athabasca rainbow trout (ART) is a distinct Alberta subpopulation of rainbow trout. They're found mainly in small, cold, headwater streams in the upper Athabasca watershed, including Moon Creek. They were listed as Endangered under *SARA* in 2019 and a federal recovery strategy was finalized in 2020.

Athabasca rainbow trout need sediment-free stream areas, cold water temperatures, and adequate unfrozen over-wintering areas. Forestry-related clearcuts, soil compaction and roads can increase peak water flows and sediment runoff into streams. These activities can also interrupt vital groundwater inflows that regulate stream temperature ranges year-round. The recovery strategy states:

- "road stream crossings typically contribute higher fine sediment loads to streams than all other land use activities combined"
- "temporary crossings (< 3-year lifespan) constructed during exploration or forest harvesting on small, intermittent and ephemeral headwa-

ter streams often cause the greatest number of problems because of their high density"

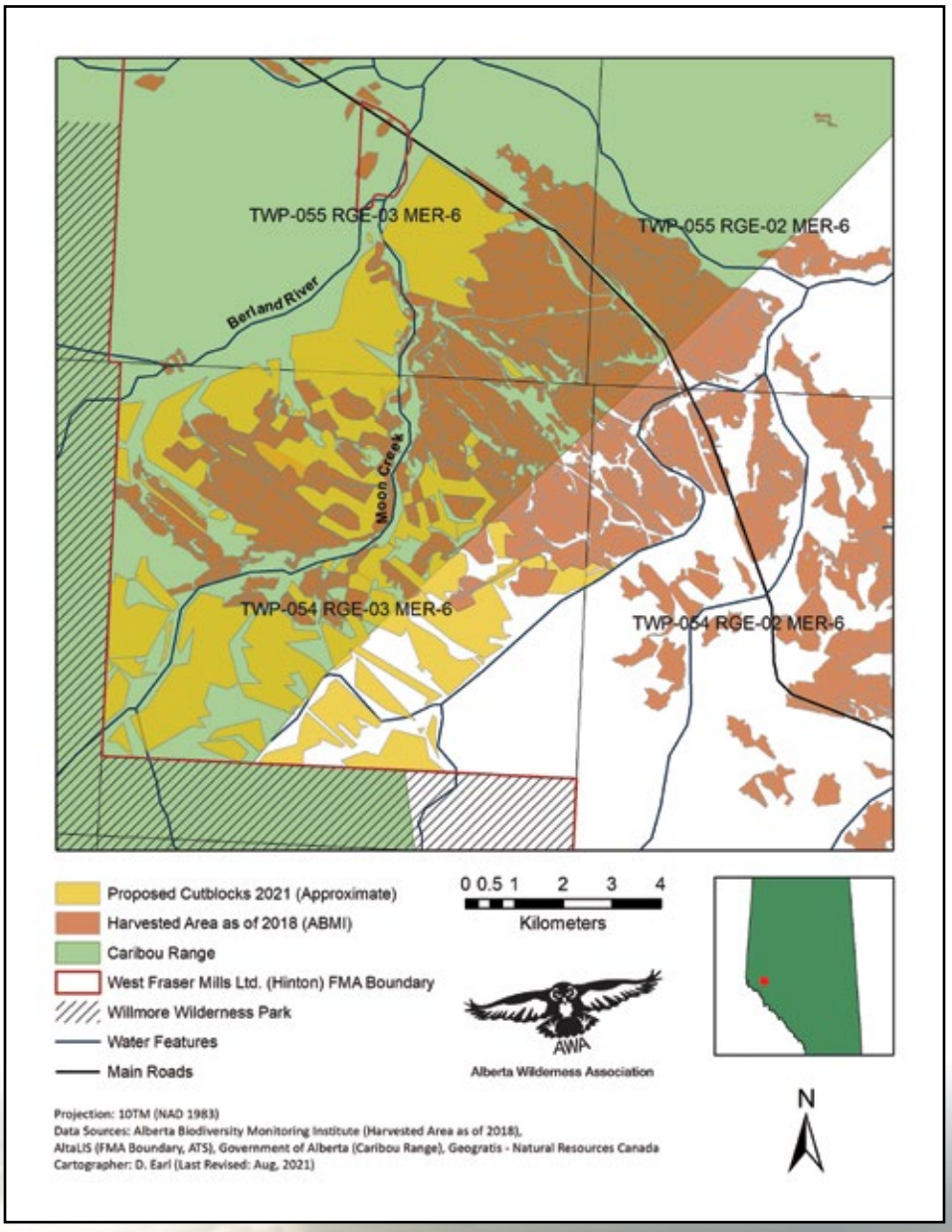
AWA has urged DFO to use rigorous field-based evidence to determine whether Moon Creek logging, in combination with past and foreseeable cumulative impacts to ART populations and habitat, is compatible with the survival and recovery objectives for this endangered species. Until DFO can provide this evidence to the public, AWA has asked DFO not to authorize West Fraser's proposed harvesting and watercourse crossings.

Losing Options Berland Task Force and Sub-regional Plan

The Alberta government has initiated a task force of stakeholders and rights holders to advise on land use in the 'Berland' sub-region. Berland overlaps both A La Peche and Little Smoky caribou ranges. Alberta directed previous task forces to provide recommendations for caribou recovery and a working landscape, considering multi-species conservation, the exercise of Treaty rights and Indigenous traditional uses, and socio-economic opportunities and impacts.

Alberta has committed that its Berland sub-regional plan will uphold *SARA* requirements to manage caribou habitat over the next decades to achieve self-sustaining caribou populations. A *SARA* action plan for Athabasca rainbow trout is also on the horizon. AWA believes that, if West Fraser's imminent clearcut proposals become reality, some of the high quality critical habitat these caribou and fish require will be degraded or disappear.

AWA has asked the Government of Alberta to require West Fraser not to clearcut in the six percent of its forest tenure that overlaps caribou range. This will protect caribou survival options while deliberations continue to develop the Berland sub-regional plan, a plan that must comply with the federal *Species at Risk Act*. It will also protect these survival options for Athabasca rainbows while federal action plans for this Endangered species are drafted. Please consider contacting decision makers to help stop these imminent cutblock plans. See AWA's Little Smoky web page – Archive tab – for suggestions and contacts.



West Fraser Hinton's proposed imminent cutblocks in the Moon Creek area extend along both sides of the Endangered Athabasca rainbow trout stream, right to the Willmore Wilderness Area boundary. Also, these cutblocks would remove intact old-growth forest habitat for Threatened A La Peche woodland caribou population. CREDIT: ALBERTA WILDERNESS ASSOCIATION.

AWA's Outreach and Community Work in 2021:

Getting Active, Going on Adventures, Talking Coal, and Promoting the Principles of "Leave No Trace"

By Sean Nichols, *AWA Program Specialist*

The year 2021 has been a busy one for AWA; perhaps especially in the context of AWA's outreach and community programs. We have undertaken three major outreach programs this year; encompassing a total of 64 events, across which nearly 2,100 Albertans have participated in AWA's programming.

Our three main programs have been: the second year of our flagship *Adventures for Wilderness* program, inviting Albertans to go on wilderness adventures in their community, province and beyond; our Coal Town Hall series of online Zoom talks and concerts; and our Leave No Trace initiative, helping people learn to minimize their impact on wild spaces and the backcountry.

In addition, AWA was proud to host an election debate for the federal riding of Calgary Confederation, as part of the "100 Debates on the Environment" project spearheaded by GreenPAC. Nearly 150 voters tuned in to hear candidates communicate their, and their parties', environmental positions and policies.

Finally, no outreach program in 2021 would be complete without incorporating electronic messaging. AWA counts over 5,000 subscribers to our electronic mailing lists and a total of over 10,000 followers on our various social media accounts (Twitter, Facebook and Instagram).

If you would like to stay informed about AWA's ongoing work, we encourage you to sign up to receive electronic newsletters at *https://albertawilderness.ca/newsletter-signup/*. Or follow us on social media at *@abwilderness* (Twitter), *@albertawildernessassociation* (Instagram) and *AlbertaWilderness* (Facebook).

Nearly 400 Albertans Take Part in Adventures Across the Province as part of AWA's Adventures for Wilderness

We could not be more pleased at how our Adventures for Wilderness program is progressing. *Adventures for Wilderness* (A4W) is AWA's program to engage Albertans in wilderness conservation. We believe an Adventure can be anything from climbing a mountain, to walking by the river, to enjoying the beauty of nature in your own backyard. Now in its second year, this flagship outreach program has so far in 2021 seen nearly 400 Albertans take part in 36 Adventures across the province and beyond.

Many (27) of those Adventures have been group outings, with participants coming together to undertake a shared adventure. These have encompassed a wide range of activities open to all different fitness and experience levels. They have taken people everywhere from a spring crocus hunt on Calgary's urban Nose Hill Park to a demanding backcountry wilderness hike investigating areas in the Crowsnest Pass coveted by coal miners. Other outings included a family ice-skating day, a cross-country skiing trip, a kid-oriented educational outing exploring the natural history of the Cochrane Ranche, many front- and back-country hikes at all times of year, and a five-outing series of birding tours around different parks in the Calgary area.

Many of the group Adventures had an educational component. They included: a trip to explore dinosaur bonebeds in the Red Deer River valley; field trips to learn about issues concerning abandoned oil well recovery and gravel mining concerns; a hugely informative trip to a part of the Ghost recovering from a 2020 forest fire, and a walking tour of Ordovician fossils found in the facades and foundations of several prominent Calgary buildings. And we would be remiss not to mention the "Jumpingpound and Hounds" hike offering everyone the opportunity to bring along their favourite four-legged friend!

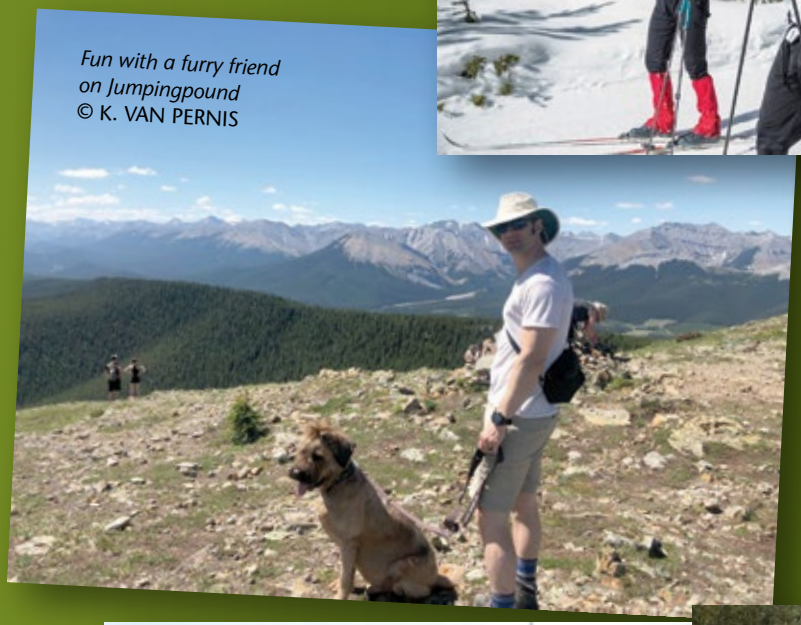
Each one of these education Adventures, as well as several of the hikes, had an expert present to give guest lectures and/or explanations of the many sites and items of interest found in the course of the Adventure. AWA is more than indebted to the many experts who graciously donated their time and expertise to the A4W program: Karel Bergman, Gerry Bietz, Alistair Des Moulins, Edward A. Johnson Ph.D, Tako Koning, Wendell Koning, Dale Leckie, Wendy Ryan, Nathan Schmidt and Dr. François Therrien.

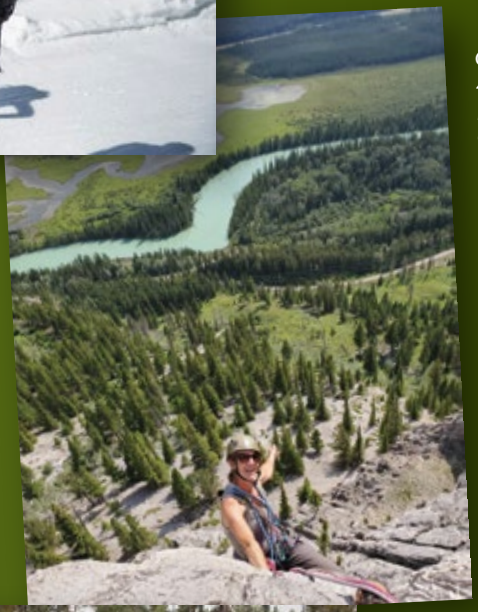
In addition to the group outings, several Adventures were structured to allow people to independently participate on a common adventure; especially important in these times of Covid. Some of them were online (Zoom) talks, but these also included: a stream and garbage cleanup Adventure; an opportunity to receive a bee nesting box and learn about Alberta's native pollinators; and an innovative Strava-based Adventure where participants competed to take part in as many winter Adventures over the course of a month as they could, sharing their stories, photos and results with each other over the Strava social media app.

Finally, some adventures featured "solo" ad-

Cross-country skiing the Mount Shark Loop
© J. JACK

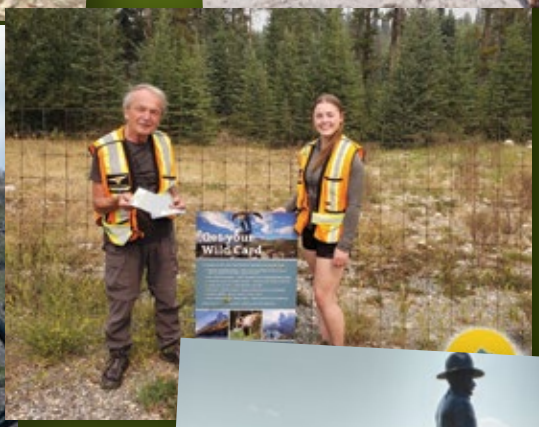
Fun with a furry friend on Jumpingpound
© K. VAN PERNIS





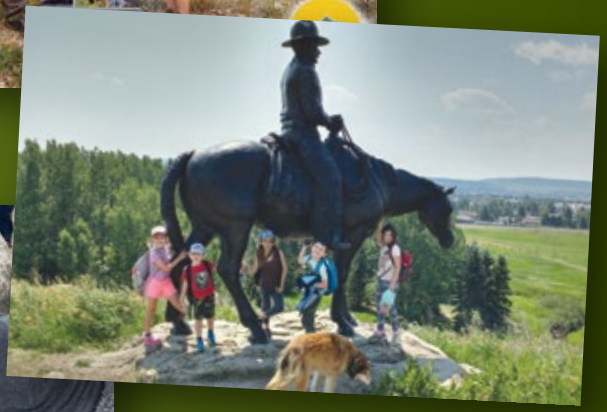
Celebrating a 40th birthday in style!
© L. WALLIS

Combining stewardship with an adventure on Plateau Mountain
© W. KING



Amazing Leave No Trace volunteers out collecting surveys

Performing garbage cleanup as part of Leave No Trace
© N. SCHMIDT



Learning about Alberta's nature and history at Cochrane Ranche
© M. O'REGAN

Finding crocuses on Nose Hill
© C. OLSON

venturers, with one (or two) people undertaking a personal challenge, raising funds, and sharing how it went. Jim Campbell and Bob Patterson circumnavigated the iconic Mount Rundle in a nonstop wilderness mountain bike marathon. Lindsey Wallis celebrated her 40th birthday by cycling 40km and doing 40 pitches of climbing, all in 40 hours. And yours truly spent a month on a cycling trip around Alberta visiting 82 – or half – of the parks that had been slated for closure under the government's "Optimizing Parks" plan in 2020, before that plan was rescinded. *(See also my article on the Great Alberta Parks Bike-a-Thon in the next issue of WLA.)*

While much fun, education, and exploration was had, fundraising remains an important goal of the A4W program. Adventures and adventurers raise funds through registration fees, donations, and sponsorships (depending on the Adventure). Congratulations to Bob and Jim who have raised $7,264 to date in sponsorships for their "Rundle Ride" Adventure, making them the top Adventure in 2012; Lindsey is next for her "40/40/40" Adventure, having raised $5,701. Overall, as of the time of this writing, a little over $41,000 has been raised for the protection of Alberta's wild spaces via A4W 2021.

In addition to the experts named above, AWA would like to thank the many hike leaders and adventure coordinators who took on the job of making this year's program so successful. I would particularly like to recognize Tako Koning who led four highly successful and well-attended adventures this year.

Of course, it is not only the adventure coordinators who have been repeat participants: no fewer than eighteen people have attended three or more adventures, with seven of these coming along four times! We consider this a true testament to the success and appeal this program is proving to have.

Stories, photos and videos from many of these adventures can be found on the A4W website at *https://adventuresforwilderness.ca/*. In addition, there are always upcoming Adventures on the calendar, for which anyone is welcome to sign up. We encourage you to visit the site to see what Adventure might tickle your fancy!

Finally, we are always looking for more ideas and people to lead new Adventures. If you have an idea or Adventure that you would like to undertake, please get in touch, either by email, or via the "Create an Adventure" form on the A4W site. We'd love to add your idea to our calendar.

Leading the Charge in the Fight Against Coal Mining

As much fun as it has been going on adventures around the province, the second arm of AWA's outreach work in 2021 has had a much more serious component to it... but also one that has seen unprecedented results.

Since January, AWA has hosted a series of Town Hall meetings both to inform the public about coal mining in Alberta and to help coordinate and inform grassroots efforts to stop new coal mining projects. Each Town Hall has featured a panel of experts to discuss a specific facet of coal mines and the coal industry. Following presentations from the panel members, participants have had the opportunity to engage the panel, and each other, in an informed discussion.

While we once might have chosen to host such Town Hall events in person, COVID-19 forced us to move to an online format, with each event taking place over Zoom. This has truly been a boon, allowing us to expand the audience beyond those in the Calgary area, to residents of the Crowsnest Pass and other areas where coal mining was proposed to take place, across the province, and beyond. Concerned participants and panelists have been able to take part from places such as B.C., Ontario, the United States, Europe, and Australia.

The five Town Hall evenings had the following discussion topics:

- Coal and Health (February)
- Coal and Economics (March)
- Coal and Communities (May)
- Environmental Regulation of Coal in Alberta (June)
- An End of Summer Round-up and Look Ahead (September)

Following the fourth Town Hall in June, AWA was especially excited to be able to offer a particularly special, and unique opportunity to members of the public. Thirty-two years ago, AWA hosted a benefit concert in Maycroft in support of the Friends of The Oldman River, a group opposing the construction of the Oldman Dam. This year, we were able to reprise that role, and host "Coal Chilla" – an online concert featuring Corb Lund, Sid Marty, John Wort Hannam, Over The Moon, The Traveling Mabels, Bradley Bischoff, Kevin Van Tighem and other performers. The online event ran for a week in late June with proceeds supporting AWA and the Livingstone Landowners Group in our shared fight against coal mining.

We think our research/advocacy and the opposition of many others generated positive results. In June the Grassy Mountain Joint Review Panel, acting as a decision maker for the Alberta government, flatly rejected Benga Mining's Grassy Mountain project. AWA, through our skilled counsel and superb experts, had intervened against this project. Three other federal decisions stand out in this campaign against metallurgical coal mining in the Rockies and Foothills. Environment and Climate Change Canada Minister Wilkinson decided that the Tent Mountain project must undergo a federal impact assessment. He also announced an important new policy. All new proposed metallurgical coal projects must undergo similar assessments. Finally, on August 6th Minister Wilkinson reiterated the Alberta Energy Regulator's Grassy Mountain decision. The Grassy Mountain Coal Project was "likely to cause significant adverse environmental effects," that "those effects [were] not justified in the circumstances" and Ottawa would not grant the federal permissions needed for the project to proceed.

Decisions such as these, so rare in Alberta's history, provide welcome confirmation that AWA's outreach and conservation work on issues such as this one may indeed provide positive policy results.

Every one of the Town Halls hosted throughout 2021 was open to the public and was well-attended. The cumulative number of registrants across all six online Coal-related events totaled slightly over 1,300 people.

Learning to Minimize Impacts in the Face of Higher Numbers of Backcountry Visitors

It will come as no surprise that Albertans' leisure preferences have changed in response to the COVID-19 pandemic. Gone (or at least on hold) are the days of a mass exodus abroad of travelers during the school holidays. Instead, we have seen many people opt for vacations closer to home, often into our province's wild spaces.

Welcome though it may be to see an increased appreciation for this natural heritage, increased numbers of people bring with them an increased impact on a landscape only marginally prepared for it. Often this impact comes in the form of increased litter and other waste, increased erosion as people travel and camp off-trail, increased disturbance of wildlife, and increased incidence of unsafe fires and other practices.

In response, AWA, with the financial support of the Calgary Foundation, launched a *Leave No Trace* initiative this summer to remind and educate backcountry visitors about the importance and principles of leaving no trace while in Alberta's natural spaces.

Indeed, AWA is not new to this form of outreach: we have often worked in the past on litter clean-up projects and related educational initiatives. Throughout the summer of 2021, AWA reprised this role, delivering an outreach program based on seven principles of *Leave No Trace* to help visitors mitigate their impacts on parks and wilderness areas. Those seven principles are:

1. Dispose of waste properly
2. Plan ahead and prepare
3. Travel and camp on durable surfaces
4. Leave what you find
5. Minimize campfire impacts
6. Respect wildlife
7. Be considerate of your fellow visitors

The program incorporated social media engagement, website engagement, volunteers initiating conversations at trailheads, and a short survey of users to help understand backgrounds, level of experience and expertise, preparedness and motivation to *Leave No Trace*. With a core of dedicated volunteers we were able to conduct a successful campaign and reach some important findings.

These volunteers engaged with the public on 20 different occasions throughout August and September of 2021, at 11 different locations. Volunteers at trailheads and in campgrounds encouraged *Leave No Trace* behaviours and surveyed 223 users. The locations included urban parks in Calgary and Red Deer, several trailheads in Kananaskis Country, various locations in the Ghost and along the TransAlta Road, and various wetlands and natural areas in Central and Southern Alberta, including the Red Deer River valley.

Notable findings from the survey indicated that while most people were familiar with the concept of *Leave No Trace*, a reminder could often be helpful and make the difference between trash being packed out or not. Also, even a little impact is often a lot: in Alberta's pristine wilderness it doesn't take a lot of trash or trail damage to impact negatively the experience. And, of course, *Leave No Trace* is both a personal and public responsibility: while users recognized proper behaviour on the trail is a personal responsibility, they suggested that public support for communications and the infrastructure for trash collection and removal is necessary.

In addition to surveying visitors, volunteers handed out "Wild Cards" listing resources and reminders about the seven *Leave No Trace* principles. We also displayed large-format posters containing the same information at trail heads and handed out compostable garbage bags for people to pack out their trash (and perhaps pick up any litter they might encounter along the trails).

A Satisfying Year, and Looking Ahead to More

Between AWA's *Adventures for Wilderness,* our coal Town Halls, our *Leave No Trace* initiative, our election debate, and our many communications via electronic newsletter and social media, we are happy with the level of engagement we have maintained with our member and supporter base, especially in these trying times.

Between A4W fundraising and other outreach-related funds AWA has raised over $60,000 so far throughout 2021. Such generous support will benefit our conservation efforts around the province.

We are always looking for new ways to include members of the public in our work, and are open to any ideas that our members and supporters can provide. We especially welcome you on any remaining Adventures this year and all of our programs in 2022 and beyond!

Wayne Howse:
Keeping the Peace for Nature

By Vivian Pharis, *Emeritus Board Member*

Wayne Howse was formally recognized for bravery several times during the 36 years he served as an RCMP Officer. In 2021 his bravery will again be recognized, but this time it will be for standing in defense of Alberta's public lands. Wayne will be honoured as one of AWA's Wilderness and Wildlife Defenders for his steadfast dedication in protecting public lands and wildlife, while both on and off duty. Sometimes he faced hostility, even danger, for that dedication. Strong childhood ties bind him to the land and have long compelled him to value and protect it. He did this by staying calm, knowing the law and applying it firmly and fairly, but only after first trying education to change destructive behaviour.

Wayne is an original Canadian, having grown up the eldest of six children on the Buffalo Lake Metis Settlement in north-central Alberta. Raised on a mixed farm, he learned early the practicalities of living close to the land with cattle and horses, of nurturing a large garden and utilizing the bush, streams, and lake for sustenance. He rode the local school bus to Caslan, later riding 50 km twice each day to High School in Lac La Biche. When considering a career, the life of a Conservation Officer or "Keeper-of-the-Land" appealed, but a far-sighted community project offered by local RCMP at Boyle won him over. That program allowed teenagers like the 18 year old Wayne to "ride along" and see what police work was all about. "The Force" drew him in. At the age of only 19 he joined up and thirty-five years later was awarded with a special long-service pin. Along the way, Wayne wore titles of Constable and Corporal and was awarded for acts of bravery and for performing emergency services.

The Howse name is one well connected historically with the Rocky Mountains and foothills. Wayne is a direct descendant of Joseph Howse, whose name adorns the pass between Alberta and B.C. at the headwaters of the North Saskatchewan River. Great, great, great grandfather Joseph is described as an English gentleman who became a Hudson's Bay Company factor and early explorer. But he is arguably best known for compiling the first grammar of the Cree language. He married a Cree lady and his descendants continue on, in Alberta and B.C. Wayne is proud that one of his sons, a Calgary area Search and Rescue Instructor, recently climbed the challenging Mt. Howse, recognized in the Rockies West Climbers Guide, Volume III.

Twenty-five of his 36 years with the RCMP put Wayne on duty in Alberta, while other years found him patrolling the Yukon and parts of B.C. He has served as a Corporal and as Supervisor of a Watch with 5 to 6 constables under his command. Work generally involved intervening with the public, reviewing investigations and providing direction and advice. But, Wayne also conducted his own investigations. Then he was most resourceful when investigating the abuse or disrespect for the public lands he treasures.

Now living in semi-retirement in Rocky Mountain House, Wayne continues to take on temporary or relief positions throughout the province when needed. This year he patrolled 3 weeks in Waterton Lakes National Park and filled in for officers at Turner Valley where his territory included the wild Upper Sheep River. The Upper Sheep is wide-open territory loved by hikers and equestrians, but the open spaces also lure the less scrupulous who expect to be out of the law's reach. When policing places like the Upper Sheep or the Bighorn's Backcountry, Wayne is often in the company of provincial Fish and Wildlife or Conservation Officers. Together several arms of the law discipline the unruly and disrespectful when necessary, as when motor cyclists reach 250 km/hr on the empty, winding roads of the Upper Sheep.

More than 50 possible recreational infractions fall under Alberta's Forests Protection and Public lands Acts. Most range around the misuse of fire, recreational vehicles and garbage disposal, but careless use of firearms, private lands trespass, disrespect for regulations and regulators and even riding a horse on certain cross-country trails could be offenses. At one point in order to educate people, Wayne simplified these regulations and their fine structure, making copies available from gas stations and general stores around Rocky Mountain House. This improved behavior, but he points out that overcoming ignorance, obstinance and unwarranted senses of entitlement are difficult challenges to overcome. Wayne stresses too that, after a previous government expanded backcountry enforcement numbers and hired additional summer staff, more recent budget cuts have depleted these guardians. The managerial load on remaining provincial officers and the RCMP is increasingly unmanageable.

Pressed for examples of extreme situations he has had to deal with, Wayne is full of hair-raising, sometimes life-threatening stories, about his life in parks and other public lands. He's proud that sometimes, people originally hostile at being charged, for example, with destroying fish habitat, come to

Wayne on the public lands he treasured and protected. PHOTO: © J. HOWSE

understand why rules exist and end up being apologetic. Unfortunately, they are the few. Others may receive substantial fines and have equipment confiscated. One noteworthy case under Wayne's watch got a good public airing. It arose when upset citizens alerted the Rocky RCMP detachment and Alberta Environment and Parks that videos were being posted on YouTube showing people stunting with OHVs in Swan Creek west of Rocky. Wayne and his colleagues analyzed a number of the videos, finding violations extending over several years. A judge issued a search warrant to enter the premises of the main perpetrator who was charged under the *Public Lands and Water Acts* with harming a stream bed. He was fined $1,000 and forfeited his $10,000 OHV to the Crown. In another case, a young fellow was caught running from a fire he let get out of control. His parents had to re-mortgage their house to pay the cost of fire fighting.

While the video case satisfied the investigators, Wayne points out that the provincial fine structure has recently been significantly altered. Fines under the *Forest Protection Act* for behaviour like leaving combustible garbage and broken bottles in campsites were increased from $425 to $840. But, fines for *Public Lands Act* violations were cut from highs of between $1,500 and $300 now to a range of $575 to $115. Charges for littering,for example, have dropped from $500 to $180. AWA believes these latter changes are wrongheaded.

Several years ago now AWA's Conservation Specialist Joanna Skrajny was given a rare chance to experience Wayne's strategies to educate, defend, and apply the law to those abusing public lands, when he took her on patrol through the Abraham dam area and Kiska/Willson portions of the Bighorn Wildland. The OHV community heavily uses these two areas. Joanna came away impressed by Wayne's understanding of the need to protect wild lands and the gentle, reasoned, but firm way he tries to educate or otherwise deal with people who disrespect the land he so respects.

Asked what he thinks could help alleviate the problems he sees with mistreatment of public lands, he offers a number of ideas. They include: more land protection, more enforcement people on patrol, and incorporating Provincial Sheriffs into backcountry law enforcement. Sheriffs already apply all provincial and federal laws that are already administered by the Province's Justice Department.

Fall is a favourite season for Wayne. It's when he takes to the woods in traditional fashion and brings home the winter's meat. It's also a favourite time of year because Wayne is an avid photographer and delights in taking photos of wildlife and magically lit landscapes. One fall photo of Wayne, taken by a close friend who is also a professional photographer, speaks volumes to the vocation and values Wayne has dedicated his life to. Wayne is wearing his red serge dress uniform and in the background is the rich green of a mixed conifer forest in the foothills. There too in the background is a bull moose studying what Wayne and his friend are up to. I have no doubt this photo reflects Wayne's ideal world, one where the forests are intact, lands are protected, the moose are magnificent, and a healthy natural order is what citizens and governments alike aspire to create and maintain.

How Many Bucks Does It Take?

By Ian Urquhart, *AWA Executive Director*

One of the favourite parts of the AWA's Executive Director job description has to be acknowledging your tremendous support for our shared mission and activities. Sean Nichols' piece earlier in this Associaton News section summarizes very well the wide range of what we do together through AWA. It might be trite, but we couldn't pursue those objectives and pursue them well without you.

One aspect of AWA I'm particularly proud of is the extent to which individuals support our activities. People who care about nature provide the lion's share of the funds AWA uses on behalf of wild spaces and wildlife. Seventy-four percent of AWA's "normal" revenues in 2020-21, a total that excludes the (hopefully) one-time COVID support we received through the Canadian Emergency Wage Subsidy program, came from people like you.

If you know someone who needs reminding about AWA's impressive track record as a charity, please send them to the Charity Intelligence Canada (CI) website (www.charityintelligence.ca). Once again AWA is included in CI's list of the Top 100 charities. Last year's 4-star rating in now a 5-star rating, CI's highest. We are one of only eight environmental charities to be in the top 100; of those eight the Bruce Trail Conservancy is the only other provincial environmental organization.

For me, another source of pride in our ranking comes from AWA's "Little Engine That Could" character. You likely remember the folktale where a little engine, not a big one, comes to the rescue of a long train and pulls it up and over a mountain. In terms of total donations, we are the Little Engine in the Environment category. Donations to the other environment charities on CI's top 100 list dwarf AWA's. But, like the Little Engine that could, AWA joins our bigger cousins in pulling the long train of conservation to its destination – healthier landscapes and wildlife populations. Coal and caribou are but two examples from this past year of those AWA successes. Perhaps we should change our motto to "I think I can, I think I can, I think I can." If you can help us become a bigger train, I promise we will pull even harder in the future.

Thank you for your generous support. Without you, our work would be neither possible, nor successful. May 2022 be a wonderful year for you and yours.

Bequests, Memorial Tributes, and Recognizing Outstanding Individuals

Wilderness and Wildlife Bequests

Individuals, members, and supporters making a bequest in their will naming a gift to AWA are helping make a difference to long-term security and AWA's ability to plan for the future.

Daphne M. Smith 1980
Dr. James Birkett Cragg 1997
Anna Nowick 1999
Myrtle Muriel Koch 2001
Ian Ross 2003
Dorothy Barry 2003
William Mayer 2004
Diane Hughes 2005
Harold deVries 2009
Ann Roberts 2009
Richard Collier 2013
Harriet Ruth Mowat 2016
Kim Bennett 2016
Carol A. Haines - 2017
Wendy Williams – 2017
Herbert G. Kariel - 2017
Ted Davy - 2018
Richard Pharis - 2018
Del Lavallee - 2019
Meyer Estate - 2019
Doris Davy - 2019
Helen Dixon - 2020
Robert Bartlett 2020

Memorial Tributes

AWA is honoured to receive memorial tributes from family and friends; we remember those gifts and individuals here.

Belton Copp 1930 - 2011
Chris Havard 1944-2015
Bill Laidlaw 1936-2020
Elizabeth Nicholls
Barbara Lynne Collister 1953-2021
Jackie Eason
Kenneth Bunn
May Bunn
Barry Emes - 1945-2021
Roxie Neale - 1922-2021
Charles Miller - 1921-2009
William John Todd 1931-2020
Derrick Gilbertson 1988-2020
Brian Volkers 1951-2021
Joanne Dunford 1921-2009
Mel Dunford 1924-2008
Weslyn Mather 1945-2015
Ray Sloan 1941-1996
Elizabeth Scout 1949-2020
Gus Yaki 1932-2020
Ian Ross 1959-2003
Roger Creasey 1953-2012
Margaret Main 1935-2020
Ann Savage 1929-2020
Richard Guy 1916-2020
Harry Taylor 1941-2020
Mary S Lore 1921-2019
Sharon Henderson 1943-2018
Muriel Beckett 1924-2020
Nancy Allison 1941-2020
Gerrit Brolsma 1935-2020
Greg Johnston 1951-2020
Murielle Carlson 1960-2020
PK (Paul) Anderson 1927-2014
John Clarence Duffy 1941-2021

Recognition For Outstanding Individuals

AWA is honoured to receive throughout the year donations from friends and families made to honour outstanding individuals and their accomplishments. This year's tributes recognize:

Jill Seaton
Kevin Van Tighem
Elsie Miyagishima
Madison McGinnis
Peggy Holroyd
Peter Duck
Barbara Buchmann
Linda Duncan
Abigail Hadden
Alexander Blair
Lois & Dick Haskayne
Kitty & Bruce Dunn
Jennifer Graham-Wedel
Kristin Jackins
Isabelle Bauer
Donna Stevenson
Linda Svaling
Peter Sherrington
Laura Hughes
Andre PIres
Leslie Simpson
Doug Simpson
Maureen Bush
Ron Echlin
Lindy Barron
Allison Wiggins
Leo McGoldrick
Julie Bain
Grassy Mountain
Brian Cooke
Meredith Wilkes
Jamie and Hannah
Jordan Mathias Pocock
Walter Retzer
Christyann Olson
Katrina Mueller
Nathan Schmidt

Updates

Jasper Caribou are More Secure this Winter

Jasper National Park's remaining caribou will benefit from Parks Canada's recent decision to close backcountry access within their ranges for the entire snow season. PHOTO: © JOHN E. MARRIOTT

Today, Jasper National Park caribou have a better chance to survive and recover thanks to the many Albertans and Canadians who spoke up for them over the past several months.

To protect caribou, Parks Canada announced on October 8 that there will no longer be backcountry access for any part of the snow season in Jasper's Tonquin and Brazeau caribou ranges. That season runs November 1 to May 15. Parks Canada also expanded the area where these restrictions apply in the Brazeau range.

Before, backcountry access in Tonquin was allowed from February 16 and in Brazeau from March 1. A 2017 Parks Canada caribou planning draft report obtained by the Canadian Press in late 2020 had described the February 16 re-opening of Tonquin to backcountry access as a "compromise to offer some protection to caribou while still allowing the existing stakeholders to operate during a shorter portion of the winter season." With these caribou on the brink of extirpation, AWA strongly objected to this compromise.

Alpine Club of Canada (ACC) deserves praise for taking voluntary measures to support caribou last winter. In January 2021, ACC announced it was suspending bookings at its Tonquin backcountry hut for the rest of the winter. Further, it joined AWA and other conservation groups in calling for all backcountry winter recreationists to lead by example and to ask their peers to stay out of the Tonquin backcountry for the entire snow season to support caribou survival.

To its credit, Parks Canada has acknowledged that "research shows that trails packed by backcountry skiers, snowboarders, and snowshoers from the valley bottom to high elevation areas can lead wolves to prey on caribou in the very places caribou go to avoid predators." AWA sought exactly this evidence-based and precautionary measure. We announced our firm support for Jasper's decision for its Tonquin and Brazeau caribou since it upheld Parks Canada's obligations to protect species at risk and ecological integrity.

A second change for Jasper caribou is that a caribou conservation breeding proposal is advancing. The proposal considers establishing a multi-year captive breeding program in a purpose-built facility at an unobtrusive site within Jasper Park. It should never have come to this, but it has. In September 2020, Jasper National Park declared that the Maligne caribou population were officially extirpated and that there were too few breeding females in Tonquin and Brazeau to sustain the herds.

Weighing the alternatives, AWA decided that Parks Canada must do its utmost to not let the remaining magnificent caribou under its care in Jasper be lost to future generations of Canadians. We urged Parks Canada to promptly and transparently conclude its many years of 'considering' caribou population augmentation measures. During those years caribou numbers spiraled down. We further stated that, if there was a viable conservation breeding plan supported by strong access and habitat management in its caribou ranges, Parks Canada should proceed quickly while as many wild caribou as possible remained in those ranges.

In early 2021 Parks Canada convened a thorough review by independent scientific experts of caribou conservation options. In May 2021 they published the expert reviewers' findings which strongly supported using conservation breeding to recover populations. On August 10, the Environment and Climate Change Canada Minister committed $24 million to design a potential conservation breeding facility and to consult with Indigenous communities and the public about the proposal. AWA and several other conservation groups issued a joint statement describing the decision to continue exploring a Jasper caribou conservation breeding as a tragic, yet necessary, interim recovery measure for caribou within the Rocky Mountain national parks.

To be viable and ethical, the dire approach of conservation breeding must be preceded by stringent precautionary access measures. AWA will continue to ask Parks Canada to re-assess and reduce Tonquin summer-fall access impacts with urgency. Our demand is informed by Dr. Fiona Schmiegelow's 2014 expert findings that substantial high quality summer-fall caribou habitat is transected by busy recreation trails. AWA will also continue to advocate for Parks Canada to manage the prime Maligne caribou range for caribou re-occupation as soon as possible. This should be a key part of their responsibility to recover Jasper caribou. While Jasper caribou are still on the brink of extirpation, we hope more secure winter ranges will bode well for their future.

- Carolyn Campbell

Pass the Cervid Harvesting Preserves? No Thank You.

Hunt farms, what the Alberta Elk Commission and its lobbyist prefer to call "cervid harvesting preserves" (CHPs), are facilities where you can pay to shoot an animal that is held captive in an enclosure. "Cervid harvesting preserve" is a classic example of doublespeak, or language that deliberately obscures the meaning of words. It's not obvious to anyone not in-the-know what a cervid is (an animal in the family *Cervidae*, such as elk or deer), and using the word "preserves" makes us think of some sort of jam. The reality of these CHPs is much more insidious, much more unethical, than what the name suggests.

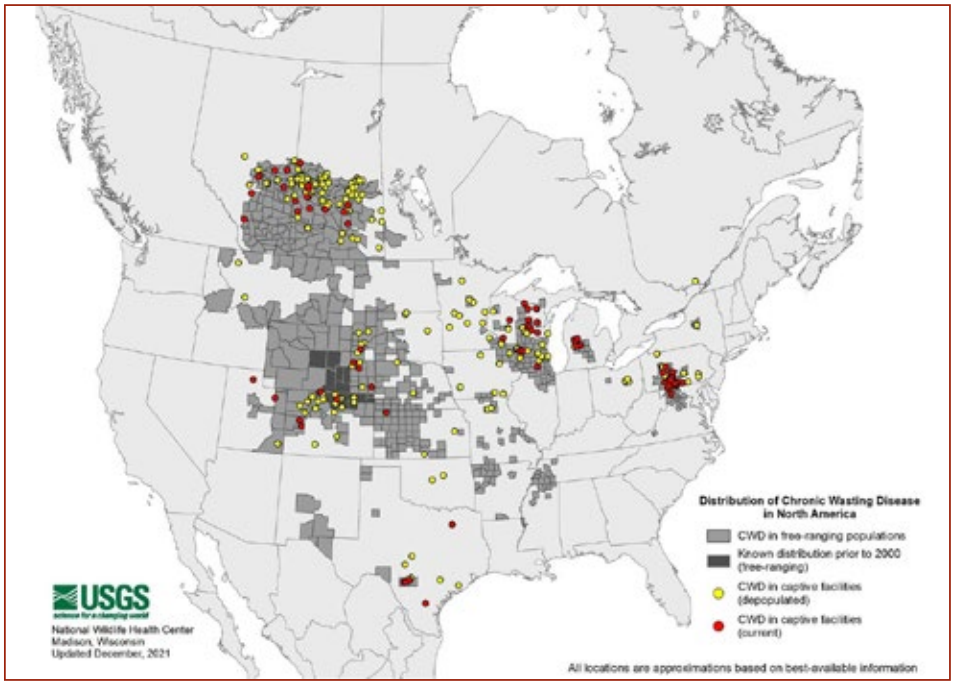
Since at least 2020 the Elk Commission has lobbied the provincial departments of Agriculture, Economic Development, and Environment/Parks to legalize hunt farms. Wherever you stand on hunting, we should all be able to agree that shooting an animal that is locked up in a pen and can't run away is unethical. That's the concept behind CHPs; so-called hunters pay thousands of dollars to go to a farm, shoot a bull elk, and hang its head on their wall at home as though they tracked it down and killed it in a fair chase. Hunt farms are geared towards people who want to feel as though they have power over nature, without actually putting in the effort. CHPs are currently legal and prevalent in Saskatchewan and several American states.

In addition to being unethical, any facility that raises cervids in captivity poses a threat to wildlife conservation. Animals raised on farms are kept in much closer proximity to one another than they would be in the wild. This supports the spread of diseases like chronic wasting disease (CWD), a prion disease similar to mad cow disease (bovine spongiform encephalopathy). The first cases of CWD in Canada were discovered on game farms, where cervids are raised and slaughtered for meat or antler velvet. CWD has since been passed on to and spread in wild cervid populations in North America. This is no coincidence. CWD is passed on very easily from animal to animal through direct contact or through soil that has been contaminated by fluids from an infected animal. The prions responsible for CWD are known to remain infectious in the environment for at least two years, providing ample opportunity for the infection to spread. The disease can take years to present symptoms in an infected animal and is fatal. In Canada, CWD has been found in wild deer and elk in Saskatchewan and Alberta, and wild deer in Manitoba. If the disease reaches Alberta's remaining threatened woodland caribou herds, the effects could be terminal for our hope to restore these iconic species on the land.

The ethical concerns and threat of disease affecting wildlife should be cause for us to worry about the possibility of legalization of CHPs in Alberta. There is also some concern that people who eat infected meat may one day be able to develop the disease. Although there have been no confirmed cases of CWD in humans, preliminary research suggests that macaques (a close genetic relative of humans) may be able to get sick from ingesting infected meat. In the current age of disease pandemics, we must take this possibility more seriously.

In Alberta, there was a push to legalize CHPs in 2002. Ralph Klein's Progressive Conservative government turned it down. The Alberta Elk Commission has reincarnated that demand. Concerns about the legalization of CHPs were exacerbated when the government of Alberta released a public survey on wildlife management and hunting. The survey asked if the government should "explore innovative tools to improve hunting opportunities on public and private lands." AWA is participating in a committee composed of hunting and conservation groups to consider how best to oppose both game farms and the legalization of CHPs in Alberta.

- Devon Earl



The Current Distribution of Chronic Wasting Disease in North America CREDIT: BRYAN RICHARDS/U.S. NATIONAL WILDLIFE HEALTH CENTER

Project Update – SSRB Irrigation Infrastructure Expansion Project:

The largest irrigation expansion in Alberta's history is steamrolling ahead without any consideration for the potential impacts of this project on aquatic ecosystem health or water conservation needs.

The South Saskatchewan River Basin Irrigation Infrastructure Expansion Project (hereafter the SSRB Irrigation Project) was announced in December 2020 as an agreement between the Government of Alberta, the federal government's Canadian Infrastructure Bank, and eight irrigation districts. The project was initially announced as an $815-mil-

lion-dollar investment into irrigation infrastructure expansion. But in November 2021, the Government of Alberta announced that the parties involved now intended to invest an additional $117.7 million into the project bringing the total to $932.7 million.

The work proposed under this project includes constructing hundreds of kilometres of pipelines to replace existing open-water canals and four off-stream storage reservoirs – either expanded from existing reservoirs or completely new. In addition to the newly constructed irrigation infrastructure, this project proposes an increase of 206,000 irrigated acres (884 square kilometres – a footprint the size of Calgary). These additional acres are supposedly gained through efficiencies created from the conversion of canals to pipelines.

Alberta Wilderness Association (AWA) and other environmental groups across the province share significant concerns with the project. The general public wasn't consulted at all; no environmental impact assessment of the project was conducted before proceeding. Many of the projects have already started. With such a large investment of public funds, regulators need to ensure that they consider the environmental impacts of the project and that the project is truly in the public's best interest – perhaps especially given future climate change scenarios. This irrigation expansion has the potential to impact in-stream flows, groundwater recharge, native grassland ecosystems, as well at species at-risk within the proposed project area. These impacts must be modelled and assessed before any more construction is started or completed.

In order to satisfy the minimum cost threshold to qualify for federal funding from the Canadian Infrastructure Bank, eight (now ten) irrigation districts had to present all proposed works for this project under a single banner. However, once funding was secured the idea that this is one project evaporated. The proposed works are presented as individual projects and the cumulative impact of all 57 projects is not being considered. A robust cumulative environmental impacts assessment is necessary to ensure the future sustainability of both water uses and riparian ecosystems within the South Saskatchewan River basin, within and beyond Alberta's borders.

Seventy-eight percent of current water allocations in the Bow and Oldman River basins are already committed to irrigation agriculture. Approving expanded irrigation acres will only serve to intensify water use in basins that are already over-allocated. This overlooks the needs for healthy aquatic ecosystems and the potential impact of the climate crisis on water availability. AWA recognizes and welcomes the benefit of the canal-to-pipeline conversions in improving water-use efficiencies. But these efficiencies should not be used to justify expanding the amount of irrigation acres if this expansion increases ecosystem risk. Water is an important public resource and in-stream flows must be protected and prioritized to support Alberta's fish and other aquatic organisms. These flows are especially crucial during drier than average years, circumstances likely to increase in both frequency and severity given predicted climate change scenarios.

With legal assistance from Ecojustice, the group of concerned environmental interests including AWA, Canadian Parks and Wilderness Society (CPAWS) – Southern Alberta Chapter, Sierra Club Canada Foundation – Prairie Chapter, The Society of Grasslands Naturalists, Southern Alberta Group for the Environment (SAGE), and Nature Alberta have written letters to Alberta Environment and Parks and Environment and Climate Change Canada. We are formally requesting that the relevant Director(s) require this project to undergo an environmental impact assessment pursuant to Alberta's Environmental Protection and Enhancement Act. We have requested that – at a minimum – the relevant Director should exercise authority to require the ten irrigation districts to provide comprehensive and detailed information on the design and operation of the proposed project activities. This information is important to ensuring that an informed decision can be made on the need for an environmental assessment.

- Phillip Meintzer

ACFN and MCFN Sign Significant Caribou Conservation Agreement with Canada

In August 2021 the federal government, Athabasca Chipewyan First Nation (ACFN) and Mikisew Cree First Nation (MCFN) released for public comment a Conservation Agreement they had negotiated for boreal woodland caribou. Such agreements are enabled under section 11 of Canada's *Species at Risk Act* (SARA). AWA strongly supports this Agreement, which we believe has the potential to greatly benefit four important northeast Alberta caribou populations and ranges: the East Side Athabasca River (ESAR), West Side Athabasca River (WSAR), Red Earth and Richardson (see map).

Because Alberta has not limited cumulative industrial impacts to the boreal forests and wetlands upon which these caribou depend, the human-caused disturbance levels in the ESAR, WSAR and Red Earth ranges are currently far too high for caribou to survive and recover to self-sustaining populations. The Richardson range has both a concerning level of anthropogenic disturbance as well as significant recent wildfire disturbance.

To support self-sustaining caribou, disturbance from both buffered human features, and from wildfire should be a maximum of 35% of the range area, not 84, not 86, not 90%. This is the maximum disturbance threshold identified for boreal woodland caribou in the federal recovery strategy approved under *SARA*. However, that habitat condition only gives caribou an estimated 60% chance to be self-sustaining. AWA is encouraged that the elements of the ACFN-MCFN-Canada Agreement could give these populations a stronger chance to survive and thrive.

The Agreement affirms and advances the essential role of the ACFN and MCFN in the recovery and protection of boreal caribou and their habitats. Measures outlined in the Agreement include:

- developing Indigenous Caribou Stewardship Plans, including identifying priority restoration areas and setting annual area-based restoration goals;

- identifying Caribou Stewardship Areas to protect and conserve boreal caribou habitat, Areas that would be managed by ACFN and MCFN;
- strengthening habitat restoration work, including developing an Indigenous Restoration Standard and building ACFN's and MCFN's capacities to plan and participate in all aspects of that work; and
- establishing an Indigenous Guardians Program to monitor caribou populations, habitat, and disturbance and to report their findings to ACFN and MCFN leadership, Alberta, and Canada.

A joint Working Group will govern the Agreement. The Working Group's Terms of Reference are already developed, which is a positive sign that the Agreement's important work can get underway. AWA has recommended to the signatories that the Agreement should add a commitment to make the Working Group's annual reports public. We believe this will build allies for the Group's work and increase federal accountability to report and act upon the Group's work promptly and fully.

Unfortunately, the Alberta government, which has jurisdiction over the provincial lands of these caribou ranges, is not a party to this Agreement. This is a major concern. AWA has recommended that the Working Group ensure that, at appropriate times, the Alberta government has the opportunity to be constructively engaged with the activities and conservation measures occurring under the Agreement.

AWA would have preferred that the Agreement and associated funding agreements, which may be renewed, were established initially for at least three or four years. Instead, the Agreement will terminate on March 2023 if it isn't renewed. A longer initial time frame is justified because some of the important caribou conservation measures outlined above likely will take four years to establish.

We support the provision that the Agreement does not limit ACFN or MCFN from pursuing any ongoing or future action against Canada for the protection of boreal caribou under the *Species at Risk Act*.

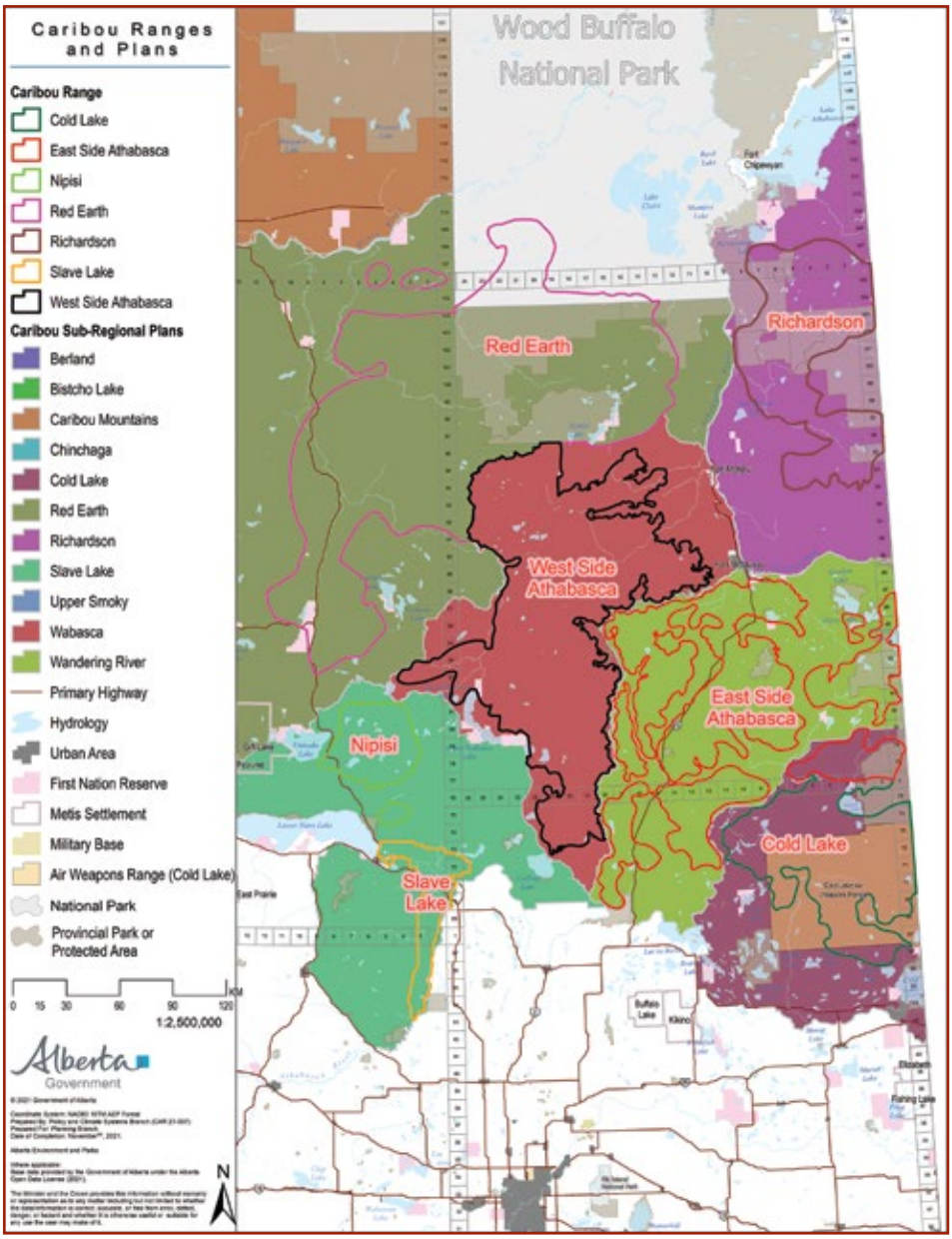
Finally, while we support this Agreement, AWA underlines that it in no way substitutes for the federal Environment Minister's and federal government's responsibilities to protect woodland caribou critical habitat on unprotected provincial lands under s. 61 of the *Species at Risk Act*.

- Carolyn Campbell

Habitat Conditions (in 2017) of Caribou Ranges in the Agreement

	Range size% (approx. km2)	Anthropogenic disturbance (buffered by 500 m)	% Wildfire disturbance	Total Disturbed
East Side of Athabasca River	13,200	88	32	90
West Side of Athabasca River	15,700	84	6	86
Red Earth	24,700	68	38	84
Richardson	7,100	36	65	84

Source: Government of Alberta.



The boreal caribou Conservation Agreement between Athabasca Chipewyan First Nation, Mikisew Cree First Nation and the federal government has the potential to benefit the ESAR, WSAR, Red Earth and Richardson caribou in northeast Alberta. CREDIT: GOVERNMENT OF ALBERTA

Louise and Richard Guy Poetry Corner

Robert Frost
"Dust of Snow"

The way a crow
Shook down on me
The dust of snow
From a hemlock tree

Has given my heart
A change of mood
And saved some part
Of a day I had rued.

IN MEMORIAM

Valerius Geist 1938-2021

We are fortunate to be able to publish two tributes to Dr. Valerius Geist who passed away earlier this year, one by AWA's Vivian Pharis and one by Shane Mahoney, the CEO of Conservation Visions and the Deputy Chair of the IUCN's Sustainable Use and Livelihoods Specialist Group. Dr. Geist received a Wilderness Defenders Award in 2004 and gave AWA's annual lecture in that same year.

Vivian wrote:

AWA prides itself as being science-based in its positions and campaigns. Bolstering this pride have been generous Alberta university professors who've willingly given of their help and time. Among these, Dr. Val Geist was for decades, AWA's chief adviser on wildlife issues. For example, for decades AWA presented the logic and science to Alberta authorities about the follies and downright insanity of introducing and supporting game farming. Our stand on this key issue was developed in concert with the world's best adviser on the topic, Dr. Val Geist. Val carefully crafted his stand against domesticating wildlife based on years of his own research, and on his commitment to the North American model of wildlife management where public ownership is foundational.

Similarly, Val helped AWA to build its arguments on other wildlife issues like the need for a publicly developed Wildlife Policy for the province. More specifically, he helped us to protect herds of bighorn sheep from human encroachment, particularly the ski developments at Mt. Allan and the open pit coal mines at Caw Ridge near Grande Cache, both on prime sheep habitat. Losing great Alberta

scientists like Drs. David Schindler and Valarius Geist leaves many of us feeling empty for their wise counsel.

Shane Mahoney wrote:

On July 6, 2021, SULi and the wider conservation world were saddened to learn of the passing of well-known Canadian scientist Dr. Valerius Geist, a pioneer in the field-based study of large mammal ecology, and a celebrated author, educator, wildlife advocate, hunter and friend. Dr. Geist was 83 years old and died in Port Alberni, British Columbia. He will be missed and remembered by an inordinately wide network of friends, students and colleagues around the world. A man of rare intellectual capacity, Valerius Geist possessed an infectious energy and optimism, as well as an extraordinary kindness and willingness to engage. His curiosity was insatiable and his capacity for work, simply astounding. But most of us who knew and admired him will forever best remember his great and unyielding humanness, his warmth and embracing smile. He was a rarely gifted man and it was a rare privilege to have known him well.

Among many other achievements, Valerius Geist was originally and perhaps best known as the foremost expert on the biology, behavior, and social dynamics of North American wild sheep, though his research and detailed writings covered an extraordinary spectrum of large mammal biology and also a wide range of topics relevant to human evolution, sociobiology and conservation science. The latter included detailed studies of environmental design, theories on human ecology, health and the origins of art, ungulate breeding behaviour, taxonomy and diversification, carnivore behaviour and predator-prey relationships, and numerous, wide-ranging aspects of wildlife management policy and practise, perhaps most notably on the disease risks and conservation perils of game ranching.

Known to many as the "Professor Doctor," Geist was recognized internationally for his ground-breaking scientific research, his voluminous published works, his insightful conservation philosophy, and for his outspoken views and advocacy for science-based wildlife management. He was the leading authority on the North American Model of Wildlife Conservation, and was, in fact, the first to use this term to refer to the unique and shared institutional approach to wildlife management policies in Canada and the United States. He first articulated the Model's core principles in the early 1990s.

Born in Nikolayev, USSR, on 2 February 1938, and raised in Austria and Germany, and then emigrating to Canada as a teenager in 1953, Dr. Geist held both an honours B.Sc. in zoology (1960) and a Ph.D. in zoology (1967) from the University of British Columbia. His doctoral thesis, On the behavior and evolution of American Mountain Sheep, was supervised by famed Canadian ecologist, Ian McTaggart-Cowan (1910-2010).

In 1961, Valerius married Renate Geist, nee Brall (1937-2014), a talented biologist and deep intellectual in her own right who provided the English translation of multiple volumes of Grzimek's Animal Encyclopedia, a near "bible" for every zoo in the world. They had three children together, Rosemarie, Karl, and Harold.

In 1967, the family travelled to Germany where Dr. Geist had been awarded a postdoctoral fellowship at the Max Planck Institute for Behavioral Physiology and where he studied under Nobel Laureate Konrad Lorenz (1903-1989), one of the founders of modern ethology. In 1968, the Geists returned to Canada and Dr. Geist accepted an assistant professorship at the University of Calgary, Alberta. He remained with the University of Calgary for nearly three decades and would go on to become a founding member and first Program Director of Environmental Science in the Faculty of Environmental Design and, later, an Associate Dean. In 1994, he officially retired and was awarded the position of Professor Emeritus of Environmental Science. The reminder of his life was spent in Port Alberni, British Columbia, where he and Mrs. Geist devoted their time to gardening, animal husbandry and endless discussions with friends, neighbours and colleagues. That period, up until Mrs. Geist's death in 2014, were indeed golden years, and their home was a rare bastion of warmth, hopefulness and grace.

Over the course of his career, Valerius Geist authored or co-authored 23 books; 7 policy reports; more than 150 peer-reviewed papers, book chapters, and commentaries; over 50 entries in 19 encyclopaedias; more than 130 popular article and book chapters; and more than 30 book reviews. His curriculum vitae reflects an extraordinary life of work and accomplishment. His first book, Mountain Sheep: A Study in Behavior and Evolution (1971) won both the Wildlife Society's 1972 Book of the Year Award and the Alberta Achievement Award. Subsequent books were awarded the Alberta Society of Professional Biologists' Peggy Thompson Award (1995 & 1996); the Saskatchewan Award for Publishing (1996); the Mid-America Publishers Association's Best Nature/Environment Book First Prize (1997); and both the International Council of Game and Wildlife Conservation's Technical Writing Prize and Culture Prize (1998 & 1999). In 2004, he won the Wilderness Defenders Award from the Alberta Wilderness Association.

A dedicated hunter and strong proponent of sustainable wildlife use as a conservation mechanism, Dr. Geist was a Professional Member of the Boone and Crockett Club, as well as a member of the International Council for Game and Wildlife Conservation. He believed that with active wildlife management and care, humans could not only safeguard but enhance the biodiversity and productivity of ecosystems. He was a revolutionary intellectual force and a tremendous teacher, embracing new ideas, challenges, and successes with equal vigour. He will be remembered not just for his academic brilliance, but for his larger-than-life personality, his relentless curiosity, his bold outlook, and his incredible capacity to give of himself – to share his knowledge, his insights, and his courage with others. He was one of the greatest zoologists of modern times, of that there can be no doubt. He was also an irreplaceable mentor and friend. His legacy will live on in the ideas he gave us and the lessons on humanity and nature that he taught. (Shane's tribute appeared originally on the IUCN's Sustainable Use and Livelihoods Specialist Group webpage: *https://iucnsuli.org/index.php/2021/07/30/valerius-geist-1938-2021/*

What is Adventures for Wilderness?

What is Adventures for Wilderness?

Adventures for Wilderness is AWA's annual program to engage Albertans in wilderness conservation. We believe an Adventure can be anything from climbing a mountain, to walking by the river, to enjoying the beauty of nature in your own backyard. Visit our website to learn about the Adventures this season and how you can support Alberta Wilderness Association.

www.AdventuresForWilderness.ca

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