

# A WILDLANDS ADVOCATE



THE ALBERTA WILDERNESS ASSOCIATION JOURNAL

NOVEMBER 2014

Time to Kick the Coal Habit

What About Carbon Storage?

Crowsnest Déjà Vu

Coal Branch Reclamation

# C O N T E N T S

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Competing Prizes – can we have both healthy landscapes and coal mining? This question is raised by Carolyn Campbell's photo of the coal sought by Grande Cache Coal. PHOTO: © C. CAMPBELL



### Featured Artist: Lisa Kozokowsky

Lisa Kozokowsky combines oils, metals, and encaustics (wax based paints) to create rich abstractive Western Canadian landscapes. Her artistic vision, where colour, movement, and illusion merge together, animates powerful and intriguing pieces that float between contemporary and historical painting styles. What Lisa calls her "wild woman" style draws from the richness she sees in both the natural and the man-made environment.

Primarily self-taught, Lisa's work may be found in individual and corporate collections across Canada and the United States. In Calgary her art may be seen at Latitude Art Gallery <http://www.latitudeartgallery.com>.

For more of Lisa's imaginative and abstractive interpretations of Western Canada visit her website: <http://www.lisakozokowsky.com>.

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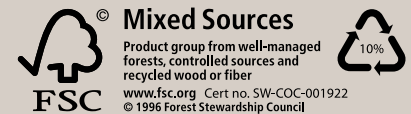
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# How About a Lump of Coal in Coal's Stocking This Christmas?

The idea for the features focus in this issue of *Wild Lands Advocate* came from an op/ed piece I read in an April 2014 issue of the *Edmonton Journal*. Drs. Joe Vipond and Raquel Feroe, two members of the Canadian Association of Physicians for the Environment, described in painful detail coal royalties – one example of the provincial government's favouritism towards Alberta's coal industry. Coal companies pay a pittance to the public for the coal they strip and dig out of our prairie and mountain landscapes.

My pain became something else once I started to look more closely at the royalty situation. That transformative moment came when I discovered that, in 2012-13, 34.7 million tonnes of coal were produced here and **Alberta didn't collect a penny from it!** In fact, the government didn't just effectively give away royalty-free coal that year it paid companies \$2.7 million because it owed

the industry a \$16 million refund from the 2011-12 production year. Sweet.

Given what we know about the human and environmental costs of thermal coal production it's high time the provincial government took strong action to transition Alberta to other source of electricity (52 percent of Alberta's electricity in 2013 came from coal-fired generating plants). If Premier Prentice wants to finally put Alberta on the path to reduce greenhouse gas emissions it makes tremendous sense to tackle coal. Such action could be central to developing a serious climate change strategy.

Now such an idea may encourage some captains of industry to suggest that the end of days is nigh. Nonsense. In 2011 the Washington State legislature passed the so-called TransAlta energy bill – a law requiring TransAlta to transition its Centralia coal-generating electricity plant completely off coal by 2025. Not

only will TransAlta transition off coal but it also is expected to spend \$30 million to support economic development and energy efficiency jobs in the affected community. It also is expected to spend a further \$25 million to develop clean energy technology in Washington.

Taking the equivalent coal-generating capacity off of Alberta's electricity grid would reduce Alberta's coal-fired generating capacity by 23 percent from the 2013 level. Let's hope Premier Prentice sees this move as an important first step that would benefit Albertans and the climate alike.

*Ian Urquhart, Editor*



*Coal Branch Sports Day circa 1920*

# Royalties:

Plus ça change, plus c'est la même chose

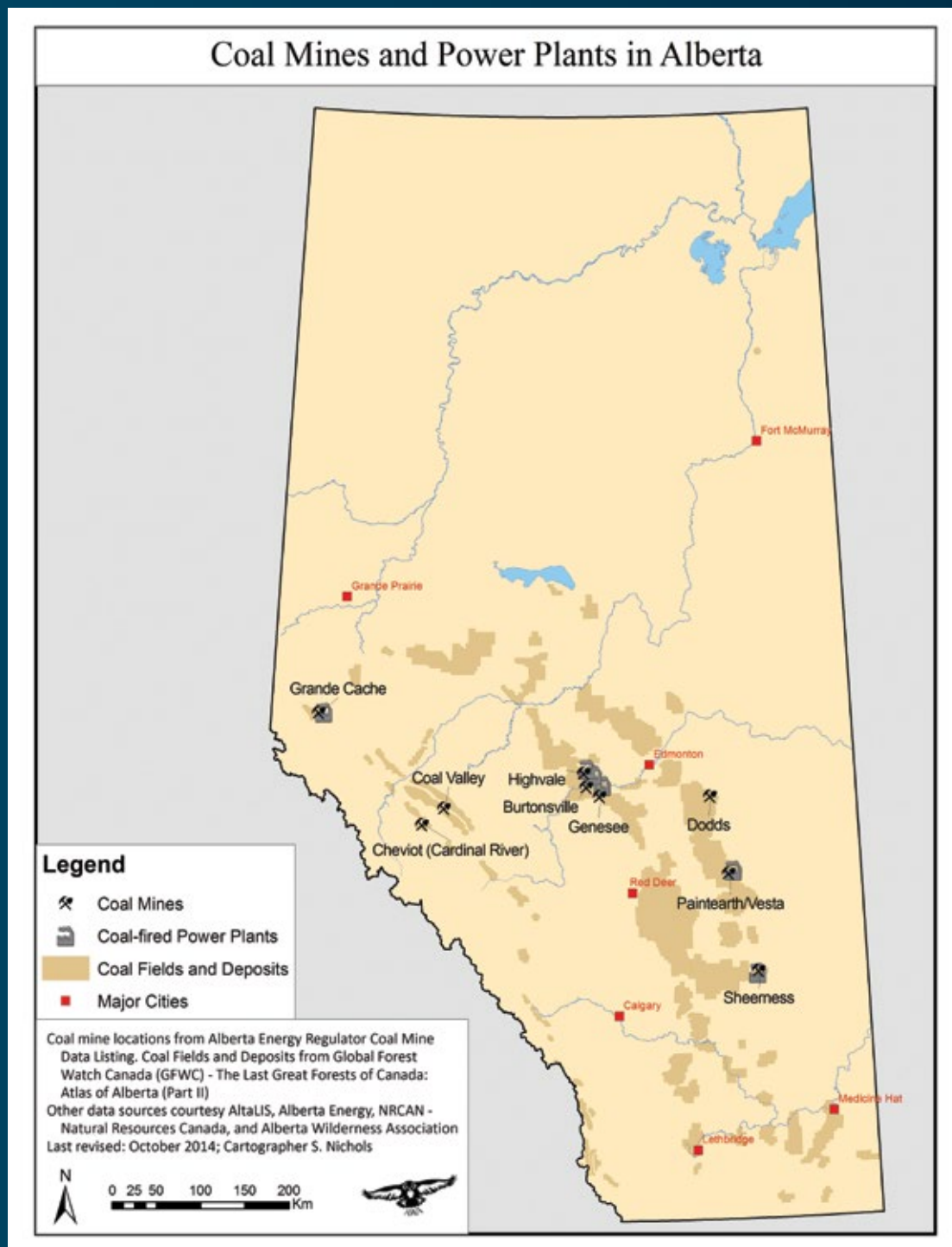
**55 cents per tonne:** Alberta's 1992 thermal coal royalty AND Alberta's royalty today.

In 1992 dollars today's 55-cent thermal coal royalty only would have been worth 37 cents.

In inflation-adjusted terms then, today's measly royalty delivers 33 percent less revenue than it did in 1992.

Measly? Yes.

A 55-cent royalty was no more than 2.9 percent of the price Sherritt received for the coal it sold from its prairie operations in 2013.



# Get Off Coal:

## A Doctor's Prescription

By Dr. Joe Vipond



**M**y most powerful memory of exposure to Alberta's coal fired power generation is from a couple of decades ago on my first road trip from Edmonton to Jasper. Having just moved to Edmonton, the iconic Yellowhead Highway was new to me... beautiful farmland, rolling aspen parkland... and then suddenly the landscape north of the highway dropped away into a massive open pit mine. Huh?! My travelling companion, very familiar with this route, calmly explained that this was a strip mine feeding the nearby electricity plants of Wabamun Lake, whose smokestacks we could see nearby. It rattled me... wasn't Canada's electricity generation primarily hydroelectric?

So began a long learning process into the sources of electricity that charges my cell phone and drives Alberta's industrial processes. Coal is king of the electricity landscape in Alberta. In 2012 52 percent of the electricity used in Alberta came from coal. This translated into burning 20 kilograms of coal per day for each Albertan, or 6.6 tonnes per Albertan annually. Or, in total, more than the rest of Canada combined. Some incredible statistics.

Should we be concerned? Once coal is scooped out of the ground it must be burned to be truly useful. It's worth remembering that coal is essentially compressed trees and other organic matter, which means that although the majority of its material is carbon chains, there are also substantial other elements, such as sulfur, nitrogen, and heavy metals. When these elements burn, they generate a vast

conglomeration of pollutants – over 60 at latest count.

So let's run down the prime suspects in our pollutant lineup PM 2.5: or particulate matter 2.5 microns, and known to most of us as soot. NOx: this refers to a number of nitrogen/oxygen compounds implicated in ozone and acid rain formation. SOx, primarily sulfur dioxide, is a key generator of the acidity of acid rain. Ozone, formed from the previous pollutants, visible as smog, and a powerful pulmonary toxin (bad for our lungs). There's also a mishmash of organic compounds such as furans, dioxins, hydroxychlorobenzene, and polyaromatic hydrocarbons. And we shouldn't forget the heavy metals such as mercury, cadmium, and arsenic. Our lineup needs a big room in the station.

The modern science behind coal's effects on health goes back to two major health disasters of the mid-20th century. In 1948 a major inversion in the steel-producing town of Donora, Pennsylvania killed 20 people and sickened 7,000 (50 percent of the town) over five days. Then in 1952 the ironically named "Great Smog" hit London. That five-day smog, primarily generated from houses using coal for heating, was calculated to have killed 4,000 people prematurely and sickened approximately 100,000.

Due to significant pollution control legislation, we find ourselves in a better situation today. But we should strive to do better. In March 2013 the Canadian Association of Physicians for the Environment (of which I am a member), along with the Lung Association of Alberta and NWT, the

Asthma Society of Canada, and the Pembina Institute, produced a report called *A Costly Diagnosis: Subsidizing coal power with Albertans' health*. Using two well-validated models, one from the Canadian Medical Association and one from Environment Canada, the report calculated the impact of these emissions on Albertans' health. The numbers were staggering.

Looking at only two of the pollutants, ozone and PM 2.5, and at only the respiratory effects, the calculations showed that coal is associated with approximately 100 deaths, 80 hospital admissions, and 4,800 asthma days (an asthma day is defined as a day missed from work or school due to an exacerbation of asthma). The report calculated that this translates into an extra 1.7-2.1 cents/kWh in electricity costs to Albertans (off the baseline of approximately 6 cents/kWh pool price). This costs Alberta taxpayers an extra \$300 million dollars per year. This is undoubtedly a gross underestimation – it doesn't consider the cardiovascular and stroke illnesses, intellectual disabilities caused by mercury, developmental disease, and cancers caused by the various other pollutants.

So, where do these illnesses occur? Alberta has 18 generating stations, scattered throughout the middle of the province. The highest concentration is directly west of Edmonton, in the Wabamun region, where 10 of the stations and 75 percent of the entire province's coal generation are located. With the prevailing westerly winds in the province, the emissions tend to settle over Edmonton and surrounding areas.

It should go without saying that, if hu-

mans are affected, so too are the surrounding vegetation (including croplands), agricultural animals, and wildlife.

The emissions elephant in the room is carbon dioxide. Burning coal is an extremely inefficient way to generate electricity and our coal plants, as a group, are responsible for approximately one-third of Alberta's industrial greenhouse gas (GHG) emissions. That's equivalent to all of the oil sands projects combined. There are viable technological alternatives to coal; coal mining provides minimal jobs for Albertans; coal producers provide very little royalty revenue to the provincial coffers – it's no wonder Premier Prentice seems likely to set his targets on the industry for his new GHG policy.

Currently two streams of regulations govern air pollution from coal-fired power plants. Provincially, the sector effectively is regulated by the Clean Air Strategic Alliance, or CASA, which is a group consisting of industry, government, and NGOs. CASA's decisions are based on consensus. Their advice is reflected in regulations stipulating that, when a generating station hits 40 years of age, it must institute BATEA (Best Available Technology Economically Achievable) air pollution controls. So far, even with our aging plants, these controls have yet to be implemented, through trading of "credits" gained from other environmental pollution measures. No plant closures are forthcoming from these regulations.

Environment Canada, on the other hand, in 2012 instituted regulations that call for the closure of all coal-fired power plants when they hit 50 years of age. (It is worth noting that the-then Environment Minister Jim Prentice proposed a 45-year phase out. The Harper government extended this for an additional five years after his departure). The first closures are to take place in 2019, with four plants in Alberta closing, and the last will take place in 2061, with the closure of the 495 MW Keephills 3 plant.

Our coalition doesn't think that's good enough. It is unacceptable to imagine these impacts on Albertans' health (and the global climate) will continue for another 47

years. Coal won't be phased out entirely until I turn 92 and my 6-year old daughter turns 53.

Instead, we propose a 10-year coal phase out. It's been done before: Ontario, which in 2004 had about the same absolute amount of generation from coal as Alberta has today, closed its last plant in April of this year. Prime Minister Cameron of the UK in late September proposed a 10 to 15-year coal phase out (a staggering 25,000 MW!). And we now have Premier Prentice publicly stating he too sees a 10-year phase out in this province's future.

Can it be done? Certainly, replacing 6,250 MW of electricity will be challenging. But, with a strong plan, it can be done and deliver many benefits for the province. The first target of this plan, the easy target, should be energy efficiency. Amazingly, we are the only Canadian province, and one of very few jurisdictions in North America, without any energy efficiency program. And, as we are currently profligate users of electricity, long accustomed to abundant energy without consequence, the gains can be enormous. The Alberta Energy Efficiency Alliance has calculated that by 2020 we could improve our efficiencies by up to 20 percent or 2,900 MW. Realizing that goal would be equivalent to the electricity generated by 10 of the 18 coal fired power plants.

The next "wedge" is renewable energy. Once again, we are the only province, and one of the few jurisdictions in North America, without a renewable energy strategy (although one has been promised for years). This is despite the fact we have the best solar and wind resources in the country. As the technology has improved, wind has become on par for cost with fossil fuel generation; solar is not far behind... and the costs for both keep dropping. In 2013, renewables in Alberta accounted for 17 percent of generation capacity but only 9.6 percent of actual generation. Contrast this with the generation percentages for jurisdictions with strong renewable energy policies. In Germany renewables generated 31 percent of production in the first 6 months

of 2014 and are projected to generate 45 percent by 2025. Renewables' share of California's production is expected to rise to 33 percent in 2020, up from 20 percent in 2013. In 2020 Nova Scotia projects that 40 percent of the province's generation will come from renewables, more than double today's 18 percent.

**“The legislature finds that generating electricity from the combustion of coal produces pollutants that are harmful to human health and safety and the environment.”**

*-Washington State Legislature, An Act Relating to coal-fired electric generation facilities, 2011*

What is Alberta's current renewable generation target for 2020? Who knows. We don't have one. We need to develop and implement strong policy to catch up to the leaders in the field.

Natural gas seems like an easy replacement to coal and will probably be a component of the solution in the short term as we transition to a fully green grid. It burns cleaner than coal, generates 55 percent of coal's CO<sup>2</sup> emissions, and produces much fewer of the other pollutants (with the exception of NO<sub>x</sub>).

But there are distinct risks to simply replacing coal with natural gas. The first is that, unlike renewables, there are fuel input costs. As the commodity fluctuates with the North American market, so too will our electricity bills... I suspect this is more likely to be to the upside. Secondly, although cleaner, methane is still a fossil fuel and is a potent climate-changing gas. Since methane is thirty times more potent than carbon dioxide it has been calculated that, if fugitive emissions

from the production process (from drilling to pipelines to transfer stations) are more than three percent the climate benefits from using natural gas will be completely negated. Current estimates suggest leakage rates of between four and nine percent. With a projected lifespan of 30 years for each plant, we are locking ourselves in to infrastructure that will continue to pollute for another full generation and will not do enough to reduce GHG emissions.

If we are going to use natural gas, we need to do it wisely. We shouldn't build massive generating plants far from the end-users (ie. such as the three new gas plants proposed for the Wabamun region). A more elegant, more efficient solution is Combined Heat and Power (CHP, also known as co-generation). If we are going to burn natural gas to heat our homes and power industry anyway, let's use the excess energy produced to spin turbines, to produce electricity right where it is

being used, and save on expensive transmission costs. Co-generation is currently used in Fort McMurray and District Energy Centres are located at many large institutions, such as our universities. These centres should be mandated for all new residential communities as well as created in existing industrial and commercial centres.

Will this ever happen? The ground is shifting rapidly. Over the last year, we have been meeting with politicians from the entire political spectrum – MLAs from all four provincial parties, federal MPs and senators. We have seen initial skepticism transform into support, and even downright enthusiasm. Multiple op/eds we've written over the last year have influenced the mainstream media writing on the subject. The *Edmonton Journal* editorial board publicly has supported a phase out. At the political and public levels it is becoming a believable and realistic solution.

We are hearing the right things from our new provincial leader. Mr. Prentice has stated that a coal phase out is a direction we will be moving in in the near future. But there is a lot of money, and institutional inertia, that will obstruct and obfuscate. The Premier will need the support of the public. If you would like to get involved, and learn more, visit our webpage at [albertacoalphaseout.ca](http://albertacoalphaseout.ca), and follow our regular posts on our Facebook page.

Those open pit mines are still there, physical scars reminding us of the impact of coal-fired power. But twenty years on, I see subtler, even more disturbing impacts. I hear those in the wheeze of my asthma patients and in the news reports of drought in California – and every time I look at a climate forecast. Dethroning King Coal isn't the entire solution to the world's problems, but it is a very local, very impactful one. I can't help but think that my children and yours deserve an Alberta coal phase out. ▲

# Should we embrace carbon capture and storage?

By Dr. John R. Parkins



**C**arbon capture and storage (CCS\*) technology extends our carbon intensive infrastructure, it perpetuates dependence on carbon-based energy sources and it plays no role in meaningful transition to renewable energy sources. This strong position against CCS is consistent with my views on all forms of proposed carbon-based energy infrastructure including pipelines for transporting bitumen. Yet a thoughtful view on CCS technology requires considering alternative views, and this is what I got in October as a panelist at a public lecture on CCS technology. The lecture was sponsored by the *European Union Centre of Excellence at the University of Alberta* and focused on lessons from successful implementation of CCS in North America and Europe. For readers who are unfamiliar with this technology, CCS is a process of capturing CO<sub>2</sub> from burning fossil fuels and storing this waste material permanently in geological formations.

Some panelists argued that a changing climate is such an urgent threat we really have no choice but to implement every available technology that can help reduce CO<sub>2</sub> emissions into the atmosphere. Particularly in regions of the world (like Alberta) with large coal reserves, it's unrealistic to assume that transition to cleaner technologies will happen quickly. So we need intermediate technologies like CCS to reduce greenhouse gas emissions in combination with many other technologies such as wind, solar and geothermal.

Germany's *Energiewende* (transition to renewables and energy efficiency) offers

a case in point. While it builds an impressive renewable energy system with extensive wind and solar electricity installations, it continues to build coal-fired power plants to meet the country's energy demands. In this context, it seems entirely reasonable to expect new coal-fired power plants to have CCS capabilities. If we are going to meet international climate mitigation targets we need CCS to get there. CCS has technical challenges and risks. For example, it often requires large investments of public funds. But these challenges are not insurmountable and the growing risks from unmitigated climate change outweigh the risks from implementing CCS technology.

Other panelists were less enthusiastic about CCS as a technological fix. When we talk about how to meet our climate mitigation challenges we shouldn't limit this conversation to the pros and cons of one particular technology. If we do that we miss the opportunity to have broader conversations about a full range of energy alternatives, some of which may be technical (like CCS) but others may be regulatory (such as a carbon tax or energy efficiency requirements). In Alberta we also have cleaner natural gas as base load for electricity that can complement the variability of renewable resources such as wind and solar. But, as Joe Vipond points out elsewhere in this issue, we must minimize fugitive emissions from natural gas operations. These alternatives to coal-fired power plants and CCS may be an important part of the conversation and need to be considered in a broader debate about

how to build a more sustainable energy system.

Another aspect of the CCS debate involves the economics of this technology. In order to make CCS viable in North America it requires large investments of public funds and an industrial partner that can utilize the captured carbon as a revenue stream. In the Saskatchewan Boundary Dam installation, the CO<sub>2</sub> is captured and sold to local energy companies for enhanced oil recovery. In other words, CCS is used to make otherwise marginal oilfields economically viable. For climate-concerned citizens, this marriage between CCS and fossil fuel production is perhaps not the most compelling reason to jump on the CCS bandwagon.

A further point I brought into the panel discussion involves questions of scale and the flow of benefits from energy technologies. Options for powering our electricity grid are proliferating. With renewables becoming more competitive and smart grid technology giving us many new ways to turn on our lights, large and centralized power plants are not the only way forward. Moreover, research shows that when citizens have a stake in the design, ownership, and benefit stream from local energy systems (such as wind turbines owned by municipalities or local cooperatives), local public support is strong. In contrast, CCS is tied to large and centralized power installations, limited to ownership by large corporations and distant stakeholders, and more likely to be opposed by publics wherever such installations are proposed.

So, after listening to scientists, lawyers,



industry officials and public policy experts discussing the merits of CCS, what are my views now? I'm left with two perspectives. Given the world's insatiable appetite for energy, we are not likely to eliminate our dependence on coal-fired power plants any time soon. So yes, I expect a strong climate change mitigation policy would require CCS in cases where the technology can be implemented with minimal risk.

The Saskatchewan government is doing just that as it tries to show leadership on strategies for greenhouse gas emissions reduction.

As a pragmatist, I see some merit in CCS. As a critic, I think CCS is stuck in an older way of thinking about how we power the grid with large and centralized systems that are increasingly irrelevant. Within decades we will have even more opportu-

nities to move beyond these Jurassic coal plants to turn on our lights and power our economies with more sustainable energy systems. ♣

*Dr. John R. Parkins is an Associate Professor in the Department of Resource Economics and Environmental Sociology at the University of Alberta*

## Lisa Kozokowsky - Featured Artist



*Wild Things, 60 x 72,  
encaustic/oil,  
PHOTO:  
© LISA KOZOKOWSKY*

# Crowsnest Pass Coal Mining:

## A Déjà Vu to Avoid

By Brittany Verbeek, *AWA Conservation Specialist*



One flight over the Elk Valley in southeastern British Columbia demonstrates the enormous territory devoted to open pit coal mining operations. Teck Resources, a Canadian company, is the primary owner and operator of five surface coal mines within a hundred kilometre radius of the Elk Valley. The coal at all five mines is metallurgical (coking coal) destined for export to Asian steel producers. Coking coal is converted to coke, which is then used in a blast furnace to smelt iron ore. According to the World Coal Association, approximately 770 kilograms of coal are required to produce one tonne of steel. In 2013, Canada was the sixth highest coking coal producer in the world, primarily due to developments in northeast and southeast B.C. Alberta, by comparison, is a very small player in the global coking coal market. So one of the first questions asked should be - is there a need for Alberta to engage at all in further metallurgical coal development, considering B.C.'s resources are far more lucrative and closer to ports, and the huge ecosystem tradeoffs Alberta will make?

The bird's eye view of B.C.'s Elk Valley landscape shows a patchwork of large dark dead zones amongst a bounty of mountain peaks and lush valleys. Alberta is preparing to be the next region to adopt that sort of view. Our view will also include the checkered squares of clear cuts along the southeastern slopes. As noted in my February 2014 WLA article, *Dark and Dirty: Time to Dethrone King Coal in Alberta*, coal mining has significant negative consequences on the environment due in part to its large

footprint on the landscape. The provincial government seems willing to allow, if not encourage, yet another high impact land use onto our forested headwaters in southwestern Alberta by allowing coal leases throughout and inevitably new open pit mines.

Exploration and investment in coal development near the Crowsnest Pass has increased significantly in the last few years. Altitude Resources Inc. and Elan Coal Ltd. signed a joint venture agreement with Kuro Coal Limited to develop the Elan Coking Coal Project. The Elan lease applications are located 15 kilometres north of the Municipality of the Crowsnest Pass and extend approximately 55 kilometres north, paralleling the Livingstone Range. The *2013 Year in Review of Coal and Mineral Development in Alberta* states that the Elan property has previously been poked and prodded by at least five different companies since the 1940s. It is possible to interpret that as: after the initial interest in the area, each company has eventually arrived at the same conclusion – the lease is not an economically viable coal mining property. It is far from existing railways and other infrastructure; the seams are thin and too steep to allow underground mining; it will be too expensive to produce and ship west for export; and global coking coal prices are volatile.

Meanwhile, the intensity of exploration, through test drill holes, contributes significantly to increased human access and disturbance levels. This is highly valuable recreation land and critical fish and wildlife habitat. Kuro, as part of its joint ven-

ture arrangement, is set to begin more exploratory drilling and prepare a scoping study, a prefeasibility study and a formal feasibility study for the Elan project. The government's willingness to allow intense exploration in prime watershed and recreation areas shows little regard for Alberta's landscapes.

The other current player in the Crowsnest Pass is Riversdale Resources, an Australian company that acquired coal assets from Consol Energy and Devon Canada. These assets included the Grassy Mountain property just north of Blairmore which has also been previously explored, studied, and mined. There is very little on-site infrastructure other than access roads and a main electrical power transmission line. According to Riversdale's website, an electrical power system, haul roads, a coal conveyor system, a coal preparation plant, a rail load out, maintenance shops, and a laboratory are among the list of new mine infrastructure needed for this project to proceed. More infrastructure equals a larger, denser footprint and less wildlife habitat. Riversdale has publicized their rail load out proposals which all suggest using a conveyor belt to transport coal to a facility on secondary train tracks near Highway 3, in Blairmore. All three proposals are likely to disrupt and may even force some current town businesses to relocate, increase road and train traffic, and require new overpass structures. Regulatory approval is still needed for the company to begin construction and operations. Riversdale has hired a number of environmental consultants who have been collecting baseline data since



*Grassy Mountain Mine, now owned by Riversdale Resources, was previously mined. The scar it left on the landscape may once again become an open wound.*  
PHOTO: © B. VERBEEK

spring 2013 to gain a better understanding of the local environment. But even with best management practices and the highest environmental responsibility, open pit mining has long lasting impacts on the mine area and its surroundings.

To Riversdale's credit, the company has hosted several open houses where community members and stakeholders have voiced both their support and concerns. These meetings suggest the revival of coal is being welcomed by some of the Crowsnest Pass community. There is a powerful historical presence of mining in the pass, with many family roots to the industry. Also many residents of Coleman and Blairmore currently commute west to work on the mines in Elk Valley. Supporters of coal development see it as an economic opportunity for the community. They see it as a chance to increase

employment and bring new prospects for local businesses – a chance to revitalize the municipality.

Others strongly oppose the project. These individuals and groups do not want to see further demolition of the landscape. Some local landowners are concerned for their property values, their drinking water and clean air, and their right to solitude and quiet. After a tour of one landowner's property adjacent to the Grassy Mountain Mine, it was easy for me to imagine the direct adverse effects it will have on these locals and potentially on many southern Albertans. I could hear the sound of heavy machinery up on the hillside in an otherwise tranquil setting. Wildlife is abundant in the area and beautifully clear creeks flow through the valley heading east. Many are home to native trout. Gold Creek and its tributaries,

located less than a kilometre from the mine site, are listed as critical habitat in the federal recovery strategy for westslope cutthroat trout. There is a lot these landowners stand to possibly lose.

A whole different set of issues could arise here because Grassy Mountain was previously mined. Contaminated water sitting in cavities from previous mining operations could be a major environmental concern. Whether or not the onus is on Riversdale to take over that liability is unclear. Water contamination is a very real risk posed by many types of mining, and one which our western neighbours have been facing. Teck Resources has had a major issue dealing with elevated levels of selenium in the Elk watershed below the mine sites. Selenium is a naturally occurring metal necessary for the health of all animals in trace amounts.



A northeast view overlooking Gold Creek – a beautiful wild area in jeopardy from the nearby Grassy Mountain coal mine development. Photo ©: B. VERBEEK

But, as with most metals, it becomes toxic and eventually lethal in large amounts. Excess selenium in fish eggs causes reduced hatching success and a host of abnormalities in post-hatch survivors. A 2013 report by Rick Heuer and Erin Sexton of the Flathead Lake Biological Station compared water quality of the Flathead River and the Elk River upstream and downstream of the five mines. They found significantly higher levels of selenium, nitrates, and sulphates in the Elk River below the mine area. The toxic threshold for sensitive fish species is 2µg/L (micrograms per litre). Environment Canada's data collected below the mines showed concentrations of selenium in fish eggs frequently exceeded 60µg/L. Teck has been pouring money into addressing the problem as part of its effort to try to im-

prove water quality over the next several years.

The Crowsnest Pass and the Elk Valley share the same geology. Selenium poisoning in Alberta's southern watersheds may become a serious issue if coal development continues. This is further supported by ongoing concerns in west-central watersheds where coal mining is well established. The risks to our drinking water and our world-renowned trout streams must be recognized.

There has been a continued push for increased federal environmental regulation in the coal mining sector. Of all the different mining operations in Canada, including metal, diamond, coal, and potash, only metal mines have a specific regulation under the *Fisheries Act: the Metal Mining Ef-*

*fluent Regulations* (MMER). Canadian coal mines are primarily open pit surface mines which produce effluent (defined as an outflow of liquid containing deleterious substances) from the extraction and processing operations. Most effluent treatment at coal mining operations in Canada is done by conventional means, such as diversion, settling, and sedimentation. The treated effluent is then discharged into the receiving environment. In 2012 Environment Canada proposed to include coal mining under the existing MMER effluent standards. This would ensure pH, total suspended solids, ammonia, arsenic, aluminum, iron, manganese, and selenium would have specific release limits. They also proposed that coal mine owners and operators be required to conduct environmental effects monitoring

(EEM) activities that are currently specified in the MMER. These measures would help to fill significant provincial gaps in regulating coal mine effluents. Final approval of Environment Canada's recommendations would standardize effluent release all across Canada and better control the release of toxic materials into watersheds.

As renewed interest in coal leases seeps north from the Crowsnest Pass, environmental effects will multiply. Any coal development approaching the Gap (the Oldman River crossing the Livingstone Range) and in the upper Oldman watershed, which are both in the scope of Elan's coal lease applications, must not be considered. Any outdoor enthusiast will tell you that area is blessed with prime fishing, hunting, hiking, biking, and camping possibilities. The ecological and recreational value of this largely unprotected country is immeasurable yet its intactness is rapidly declining. Allowing more coal developments along the Eastern Slopes would take another giant step backwards from securing headwaters. When it comes to coal mining in the Pass, the risks seem far greater than the rewards for Albertans.

AWA believes it is incumbent on our government to privilege the ecological values of water and wildlife over coal mining in the upper reaches of the Oldman River drainage. If Alberta is seeking to improve its global environmental image, new open pit mines along the classic Eastern Slopes should be out of the question.

AWA believes Alberta and B.C. need to cooperate and better represent these values in the balance between economic development and environmental protection. Further piecemeal dissection of these ecologically and aesthetically important landscapes must be prevented. ▲



*Gold Creek and its tributaries, part of the Oldman watershed and less than one kilometre from Grassy Mountain Mine, boast pure-strain westslope cutthroat trout. Photo ©: B. VERBEEK*

# Coal Mine Reclamation in the Coal Branch:

## A Volunteer Steward's Perspective

By Alison Dinwoodie



I became a volunteer steward in 1989 for the Tripoli Ridge candidate Natural Area, as it was called then. Alberta Parks now describes the ridge as the mountain backbone of Whitehorse Wildland Park, the park 60 kilometres south of Hinton containing the Cardinal Divide. This is a relatively accessible and extensive alpine/subalpine area. I wanted to become more familiar with mountain ecology as I was always interested in mountains. I didn't realize I would soon find myself involved first with recreational access management plans, then environmental assessment and cumulative effects hearings for a coal mine. Over time I would see how these deliberations affected the pre and post-mining landscape. I am no expert in these subjects, so what follows are some notes of my experiences, experiences where I learned a lot about the area's alpine

and subalpine flora and fauna.

Tripoli Ridge lies just south of Cadomin village, between the old townsite of Mountain Park and the Cardinal Headwaters leading into Jasper National Park. Its eastern slopes drain into Prospect, Cheviot, and Thornton Creeks, forming the headwaters of the McLeod river. Twenty-five years ago it was becoming evident that the growing popularity of Off Highway Vehicles (OHVs – defined as 'any motorized vehicles for cross-country travel on land, water, snow, marsh or other natural terrain') was having a significant effect on the local landscape. So discussions about an access management plan were initiated.

A series of meetings with various stakeholders was held over 1992-93. They produced the Coal Branch Access Management Plan (AMP) in 1994. The adjacent coal lease had not yet been developed but

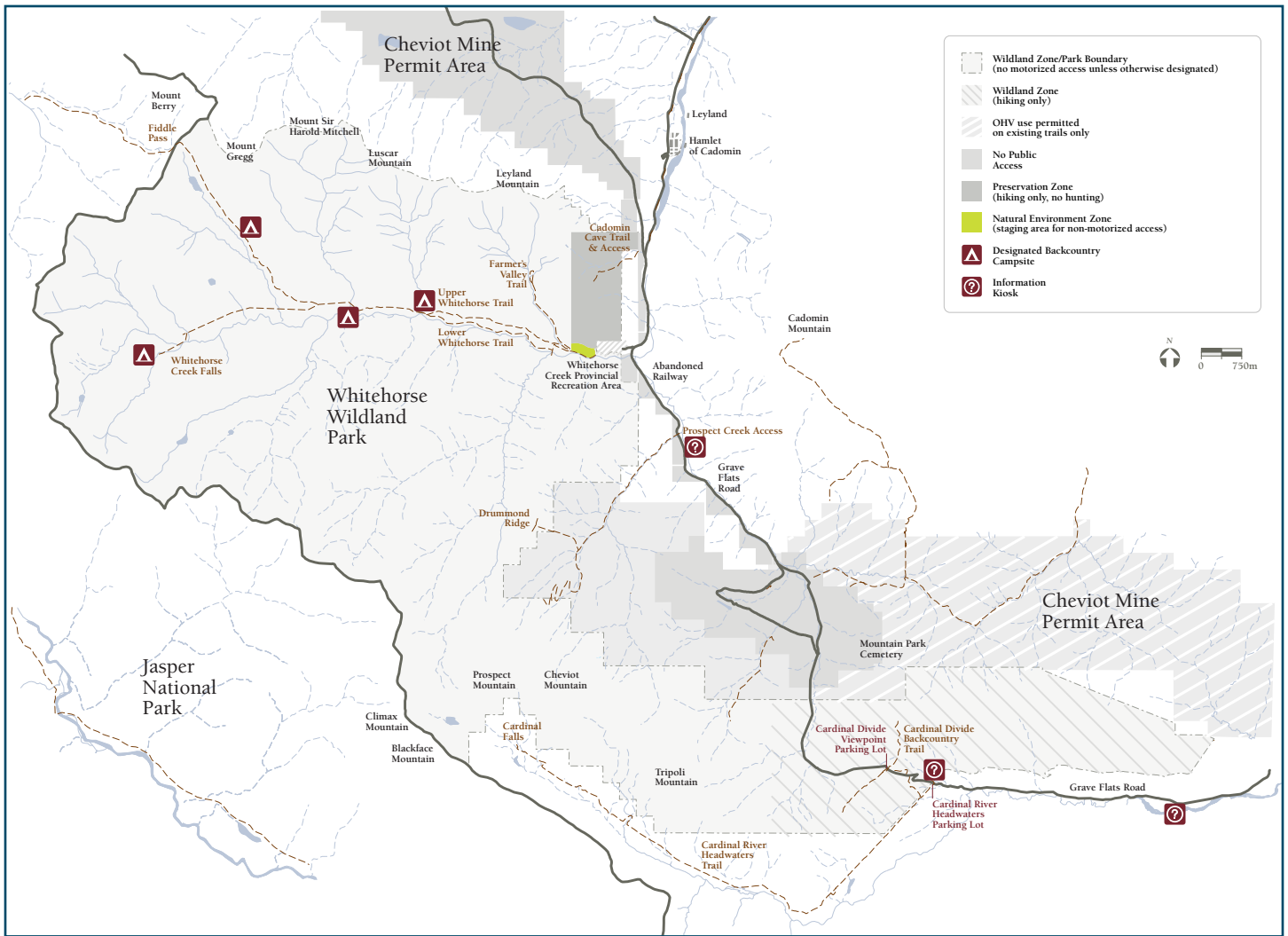
we were told that it would be considered when the time came. As a result, the long-term effect of a new open pit coal mine was not taken into account in the AMP. In 1995, Tripoli Ridge became the Cardinal Divide Natural Area, (CDNA) by Order in Council, which included the east and west ridges of the Cardinal Divide. The Divide area is a very significant watershed, not only for its topography but also for its very rich biodiversity.

Coal mining east of the Rockies and south of Highway 16 has a long history. Mountain Park, the home of the original Mountain Park Mine, celebrated its 100th anniversary in 2012. Mining there ceased in 1950, when diesel replaced coal as the fuel of choice for trains and the village was abandoned. My first encounter in 1973 with mine reclamation was to tread carefully round the edges of the old West Pit, a hole of unknown depth with some bits of rusty wire remaining to prevent the wayward from falling into the water. Large areas of bare ground remained, which provided a great playground for OHVs. This was recognized in the 1994 AMP as a de facto general recreation area for OHVs. By then random camping was rampant and tire tracks went in all directions. There was virtually no reclamation there unless reclamation meant converting the landscape into an OHV playground.

One of the consultant botanists showed us some areas of small heaps of spoil, left as they were originally 60 years ago. These illustrated the differences in micro-topography for the re-colonization of some native plant species. As mining occurs at an



Coal mining in the Coal Branch and reclamation have been a boon to the area's bighorn sheep population  
PHOTO: © K. PEARSON



Alberta's Coal Branch Today CREDIT: Alberta Parks (<http://www.albertaparks.ca/media/5517941/whitehorse-wpp-map.pdf>)

elevation of about 5,500 feet, the area's climate is very harsh. It experiences extremes of cold, wind, and snow any month of the year, so minor changes in the orientation of a site can make a significant difference to the shelter provided and the accumulation of snow or rainfall. The soil sites also demonstrated how much time is required to re-introduce plants due to the elevation and harsh climate. These observations are now incorporated as 'rough mounding' in the final transformation of current mined hillsides. This technique also helps prevent more erosion, one of the most important reclamation objectives.

The Gregg and Luscar mines, just north of Cadomin, started up in the early 1920s, closed in 1956, and re-opened in 1970 for open pit mining for metallurgical coal. The Gregg Mine closed in 2000 but Luscar continued for a few more years. The main

mine reclamation goal here was to protect the watershed, provide for wildlife and fish habitat and allow some recreational use.

The initial goal was to encourage vegetation growth as soon as possible to stabilize the soil to help prevent erosion. It also accelerates the return of wildlife, especially the ungulates. Their return enriches the soil and invites the return of other species, including predators.

Mine reclamation efforts have tried various seed mixes over the years. While not a botanist, I am a member of the Alberta Native Plant Council and their expert advice has been invaluable. One of their concerns was the use of excessive non-native or invasive species that would prevent re-colonization of the terrain by native species. The nutrient poor soil needs nitrogen but most of the native nitrogen-fixing plants grow too slowly to prevent erosion so other

faster-growing species have been used. At first sight this approach was very successful at the Luscar mine. Lush fields of cicer milkvetch and other agronomic grasses soon covered the bare hillsides. It has been a boon for bighorn sheep, the primary ungulate at these altitudes. Grizzly bears, wolves and other predators have gradually re-colonized the area too – although the noise from mining operations deters them from approaching these sheep sanctuaries.

One of the factors I had not appreciated was that it is not just a matter of getting the vegetation to grow quickly, but also that the landscape needs to be modified to conform to potential wildlife habitat preferences. Cardinal River Operations (CRO) took us to see Luscar's reclamation results at Sphinx Lake – one of their show pieces. Nature's creeks into and out of the lake had been diverted into a tunnel during mining. The



*The Cheviot Mine* Photo ©: K. PEARSON

exhausted pit had then been allowed to fill with water and the creeks more or less returned to their original beds, complete with small waterfalls. The steep sides of the lake pit had also been modified to become littoral shallows, more conducive to small water species and as a result also to wading birds and ducks.

Another noticeable change in the landscape was to the steep slopes left after mining. One or two terraces were contoured across them to provide valuable escape routes for the bighorn sheep from their predators.

Other small heaps of rocks, which one might think had been forgotten, were also deliberately left to provide cover for some of the smaller species, like marmots or ground squirrels, which are all part of the wildlife diversification efforts.

Not all the landscape had been entirely altered. Some reasonably large tree islands had been left untouched to provide habitat for a number of birds, shelter for elk and moose, and importantly, to provide a source of seed beds for native plant spe-

cies to infiltrate into the adjacent disturbed land.

Sphinx Lake exemplifies how some effective reclamation can be carried out. But, it requires careful thought and planning before the mining starts. On-going monitoring should be carried out on a regular basis to ensure that the anticipated results can be delivered and maintained. While I think the end results at Sphinx Lake are quite impressive we mustn't forget how long it takes to produce an award-winning example of reclamation. Mining at Cardinal River's Luscar mine resumed in 1970 and ended in 2004. The Sphinx Lake reclamation project was initiated in 2005. So don't expect mining lands to be re-opened to the public immediately in a month or two – it will take many years after mining ends.

Mine reclamation has come a long way since the Mountain Park Mine closed.

With about ten years of production left from the Luscar mine the mine's owner, Cardinal River Coals, began planning the Cheviot mine project. Recognizing that Cheviot would sprawl across a very sensi-

tive and valuable ecological environment, it was necessary to have an environmental impact assessment. As stewards of the adjacent Cardinal Divide Natural Area, the Alberta Native Plant Council was recognized as being directly affected by the proposed mine and was granted intervenor status. We therefore had access to the project's consultant reports and could present our own comments or additions. Having recently retired I was able to deal with all the paperwork! One advantage I had was that I had hiked and explored a fair bit of the landscape under discussion. That let me refer to actual places or observations and I think gave more credibility to our statements. There's a useful lesson here about the potential value of experiential knowledge.

It took several weeks to hear all the submissions from Cardinal River Coals and intervenors. The first Panel report in 1997, among other recommendations, recognized the need for greater reliance on native plant species, particularly with the use of direct placement of top-soil to



provide viable seed sources. It also recommended a buffer should be extended between the mine and the Cardinal Divide Natural Area and there should be no new OHV trails. The impact of the mine on the grizzly bear, an indicator species, would be substantial and required special consideration. One result of the first round of hearings was that the Whitehorse Wildland Provincial Park (WWP) was announced in 1998. This park incorporated the Cardinal Divide Natural Area and, by including the Whitehorse valley as well, offered more continuity and protection for wildlife over a greater area.

Government also acknowledged that because of the potential impact of increased motorized traffic on the reclamation goals, a Forest (now Public) Land Use Zone (PLUZ) should be introduced, as had originally been recommended in the 1994 AMP. The hope here was to provide better control of motorized activities.

But the environmental concerns did not stop here. Environmental groups felt the cumulative effects of the mine, together with other local forestry and industrial activity, on the wildlife and ecological integrity had not been given sufficient attention. After a 1999 Federal Court of Canada decision that the original Joint Review Panel environmental assessment didn't meet the requirements of the *Canadian Environmental Assessment Act* the Joint Review Panel was reconvened in 2000. We presented evidence then about the potential for additional cumulative effects from increased OHV recreation activity, because of the changed circumstances of the WWP and the PLUZ. These issues otherwise might not have been debated. From the perspective of this steward, increased OHV activities have now become one of the most contentious issues on the post-mining scene.

In 2003 the original Cheviot plan was modified to use a haul road alongside the public road and the river, rather than revitalizing the old Mountain Park railway, which was falling into the river. The haul road would deliver Cheviot coal to

the Luscar mine processing plant, thus avoiding another extensive industrial development at Mountain Park. Cardinal River Operations (in 2003 Cardinal River Coals became a wholly owned subsidiary of Teck) also changed the original order of pit development so that the Cheviot and Prospect pits would be mined first, before the ones on the east side of the Grave Flats Road. This would enable the company to commence reclamation efforts on the west side of its lease area at the same time. Today we are at this stage; active mining on the west side is nearly finished.

Cardinal River has for the past several years met with a group of OHV and Fish and Game club members to discuss access and maintenance of trails in the Luscar and Gregg mines. More recently, discussions have turned to a Luscar-Gregg Land Use Plan, which could then be used as a template to apply to other company properties. At the earlier Cheviot Mine Hearings it was stressed that control of post-mining recreation activities should be established through a comprehensive regional land use plan, rather than in a piecemeal way through individual trail developments. Unfortunately the piecemeal approach is what is happening now with the OHV

users demanding that one particular trail, from Prospect Creek to Drummond Ridge (what they like to call one of their 'traditional' trails) should be opened up as soon as possible. If this happens it could set an unwelcome precedent where other OHV trails are opened on an ad hoc basis. This promises to alienate other users. More importantly this could promote the disturbing or poaching of wildlife. It could also lead to permanent and extensive damage to the fragile alpine/subalpine vegetation.

I've been part of the Cardinal River saga for over 25 years now. I've seen public pressure in the first instance help strengthen corporate commitments to reclaim the landscape to something akin to what nature had provided before mining began. I've also seen Cardinal River Operations take their legal reclamation obligations seriously. I'm concerned now though that, without public and environmental group attention to a campaign for a comprehensive regional land use plan, the good reclamation work will be ground up under the wheels of OHV users. This magnificent area deserves much better than to become an area where one group's wants take precedence over other considerations and values. ▲



Whitehorse Creek and valley was an important addition to Whitehorse Wildland Provincial Park  
Photo ©: K. PEARSON

# Kilini Creek and Gravel Mining Impacts:

## A Microcosm of Cumulative Impacts on Alberta Water Resources

By Carolyn Campbell, AWA Conservation Specialist



**M**ining for gravel and sand occurs in many areas of Alberta. Although it attracts far less media coverage than the petroleum industry or agriculture, gravel extraction can have significant effects on local groundwater, river corridors, and wildlife habitat. In June 2014 AWA member Mike Northcott invited me to take a first-hand look at the past, present, and future of gravel mining impacts on Kilini Creek in Lac Ste. Anne County, where he has resided for the past 30 years.

When so many knowledge gaps still exist about surface water and groundwater

resources and capacities, landowners depending on groundwater for their domestic water, as well as conservationists, can understandably be concerned about gravel mining impacts. Mike belongs to both categories. He and other residents of three counties in the Sturgeon River watershed (a North Saskatchewan River sub-basin west of Edmonton) formed a stewardship group in 2001 to keep a careful watch on the cumulative impacts of gravel extraction and other regional activities on groundwater. They named their group the Onoway River Valley Conservation Association (ORVCA),

after a major pre-glacial era river in the region that is now covered under layers of sediment, and today is an important regional fresh groundwater aquifer. Mike and other ORVCA members have helped Lac Ste. Anne County become more proactive in examining gravel mining impacts. Nonetheless ORVCA's activities illustrate the challenges that remain in managing this extensive but low profile industry.

Alberta used to allow 'wet mining', gravel mining right in a river or wetland, which exposed fish and other aquatic life directly to petroleum contaminants from equipment



*If high berms remain along one section of Kilini Creek's western bank, as reclamation plans suggest, the connectivity of the river corridor will be another long-term impact from gravel mining. PHOTO: © C. CAMPBELL*

lubricants. Thanks to a landmark lawsuit by Martha Kostuch in the 1990s, mining in water bodies was stopped. But floodplain gravel extraction sites remain. Gravel mine sites in or near the floodplain of a water body are attractive to operators because wash water is available nearby. Often a water license is obtained to divert water for these purposes. These sites tend to affect alluvial aquifers, that is, groundwater near the soil surface that is connected to the nearby river or lake.

Mike took me on a canoe-assisted tour of Kilini Creek watershed to help me understand its 60-year relationship with gravel mining. From its headwaters, the Creek flows northward roughly 15 kilometres before draining into Matchayaw (Devil's) Lake. Burbot, walleye, yellow perch, and northern pike are all found in the lake that drains into the Sturgeon River and on into the North Saskatchewan River. The first gravel mine operators were active in this area from 1950 to 1988.

In the upper part of Kilini Creek, Mike and I paddled across a one kilometre long pond with large semi-vegetated rocky mounds around the edges. This is an ex-gravel pit, the mounds being left from 'wet mining' that is now illegal. A 1992 reclamation report for this area states that until 1980, no reclamation standards existed in Alberta for gravel extraction operations. The pit that is now a 1 km long pond was 'grandparented' or exempted from stronger reclamation rules introduced later. From 1988-1992, some of the previously mined, unreclaimed area was levelled and re-vegetated to tame pasture by the second operators, who have since been bought out by a third operator.

Downstream, the former operator built a road across the creek. The road's culvert hasn't been effective. This obstruction partly dams the creek into the former gravel pit, conveniently keeping the pond level high. The artificially high water level enabled both the former and current operator, in turn, to pump water from the pond for operations downstream. Initially this water diversion and pumping was unlicensed. ORVCA members were concerned about impacts to

their well water levels and reported to Alberta government water regulators that this was a non-compliant activity in the early 2000s. Groundwater studies conducted due to that concern revealed that local aquifers flowed towards the pond, rather than the reverse, so their concerns were not upheld. The pumping, now licensed by the government, continues in drier years.

Further downstream, we paddled towards the active gravel extraction operations of the current lease owner. When gravel is mined from deposits below the water table, it exposes the aquifer, which is the channel of gravel, sand, and other loose rock through which groundwater flows; the gravels that carry groundwater are the focus of the gravel extraction. In areas with a high water table, operators need to 'dewater' a pit area before gravel extraction can proceed. A dewatering pond might be created from the diverted water. The now-exposed aquifer will be subject to evaporation loss; this water stays in the global water cycle, of course, but the aquifer will contribute less than it otherwise would have to any local streams, wetlands or lakes that it flows towards. Final site reclamation might include creating a permanent water body that, if well reclaimed, may serve a habitat purpose but entrenches the evaporative loss to other nearby receiving water bodies. In the Sturgeon River watershed, this loss amounts to hundreds of thousands of cubic metres per year.

Gravel mining in aquifers poses contamination risks to the exposed aquifer and to any connected surface water bodies, as mining operations might store fuel, salt, herbicides, and other substances toxic to aquatic life. These water impacts and hazards are subject to regulations that have strengthened over time, but are infrequently audited. Since 2001, for various gravel operations in its area, ORVCA has reported unauthorized fuel and chemical spill risks, water containment reservoirs, and water pumping volumes. Even if properly stored for 'normal' water conditions, contaminants can be swept by high flood waters into rivers and connected aquifers, as happened along

the Highwood and Elbow Rivers in southern Alberta in 2013. ORVCA is also concerned that risks from underground contamination at formerly reclaimed sites are not adequately monitored.

There is little cumulative effects management in Alberta of impacts from gravel mining and other multiple industrial, residential, and recreation pressures to surface water, ground water, and river corridor ecosystems. In 2011, Lac Ste Anne County faced five new gravel applications in its southeast corner aggregate management area, which overlaps with Kilini Creek. One proposal would dig 15 metres below the water table. To its credit, the County formed an Aggregate Management Area Steering Committee (AMASC) and asked for information and advice "to ensure that growth of this industry will not result in unacceptable effects on the environment and people."

As part of its information gathering, the County commissioned a report on general gravel mining impacts and, using already available information, on potential county-level impacts on water quantity, water quality, and wetlands. This report was completed in October 2012. The consultants' conclusion was that existing and continued gravel mining had minor regional cumulative impacts, and no further controls on timing and spacing were recommended beyond current regulatory requirements. However, the authors added that the uncertainties in available information reduced the confidence of these conclusions. They highly recommended, therefore, that field-based monitoring take place to gather site-specific and regional information. Curiously, this report is not available electronically, even upon request, though Mike showed me a hard copy he received as an AMASC Committee member.

As we paddled towards the active gravel operation next to Kilini Creek, we crossed several beaver dams, and saw several impacts of gravel mining. On the east bank was the natural riparian area, flat, with natural low wetlands and some large beaver lodges. Visible along the Creek's west side



*This gravel extraction site on higher ground will likely interfere less with groundwater than the ones further down in the floodplain. The piles of sand and clay left after washing still present reclamation challenges, such as how water drainage on the reclaimed topography will affect natural water bodies.*  
PHOTO: © C. CAMPBELL

were constructed earthen berms shielding the creek from gravel pit-affected water runoff. Farther downstream this berm is at water's edge. According to Mike, the reclamation plans will leave these berms in place. If so, the river corridor's habitat value and connectivity will be affected where the western wall is at the water's edge and is redirecting the Creek's flow.

Gravel operations wash silt and clay from the mined gravel and typically discharge that wash water into settling ponds. Here, wash water is put through pumps that remove some of the fine sand and the water then passes through several settling ponds. The final stage settling pond discharges into Kilini Creek. As we approached the tributary that connects with the mine's wash water discharge pipe, we saw a very distinctive cloudy sediment plume in the main stem of the creek. This discharge is licensed and regular water quality testing is conducted. An annual water quality report is filed and the operator must notify the government of any spillage, upset or other change. The 2012 'gravel impacts' report said there would be minimal impacts from additional sediments from pit operations because area water bodies already have high algae productivity, high nutrient levels, and low clarity. This was based on the observation that algae growth increases in the summer as phosphorus is released from lake sediments.

Yet the wash water discharges year round into the creek, night and day.

We continued downstream to the edge of another onstream reservoir on Kilini Creek. A dam built in the 1960s creates the operation's holding pond, from where water is pumped to wash the gravel. Its height was increased in the 1970s. ORVCA discovered that Alberta Public Lands had never issued a license of occupation to authorize this dam. When they raised the matter, Public Lands issued the license in the early 2000s, forty years after construction. I learned that there's no opportunity for fish to come up Kilini Creek from Matchayaw Lake and the Sturgeon River anymore, as the dam has no fish passage.

We left the immediate vicinity of the creek and drove to nearby gravel extraction sites on higher ground. There is less interference with groundwater on these sites. But we saw other reclamation challenges, where sand and clay left after gravel washing was piled up in 50 foot high banks. These banks have questionable stability and are subject to slumping during wet conditions. Mike stated that too little consideration is given to the unnatural reclaimed topography's impacts on drainage patterns into natural water bodies and groundwater.

Reclamation standards have improved. A 2011 proposal for a new gravel operation emphasizes that five end pit lakes will

be created after mining operations finish 15 years later. They will be "constructed primarily to provide wildlife and waterfowl habitat". It's a good sentiment but Mike still worries about the impacts of exposing that much groundwater surface area. This proposal calculated that the five end pit lakes will mean an evaporative loss of 17,550m<sup>3</sup>/year for the exposed aquifer. That's the annual water consumption of 230 Alberta families, according to a recent Environment Canada water use survey. The 2012 'gravel impacts' report noted that wetlands abundance could be reduced from water pits due to changes in surface water drainage and that ponds and end pit lakes increase evaporation and raise groundwater temperatures. These effects would be reduced by locating pits at higher elevations would reduce these effects since there would be less interaction with groundwater.

The authors of the 2012 gravel impacts report recommended a wetlands inventory, and regional groundwater monitoring to measure water quantity and quality effects. They also recommended that if multiple new developments are being considered, thorough surface and groundwater management plans be required for each new development. These plans should be given to County and provincial regulators to allow cumulative effects assessment. To date there has been little evidence that any of these

recommendations have been followed. Mike and ORVCA continue to raise concerns on a project-by-project basis about inadequate cumulative impacts management and reclamation effectiveness.

Kilini Creek is a small part of the fast-paced changes taking place in the headwaters of the North Saskatchewan River basin. Growing rural and urban subdivisions all use gravel and require water and wastewater services. The mean flow of the Sturgeon River shows a notable declining trend since the 1970s, which should provide greater urgency to answering these questions: what water does nature need to sustain wetlands, streams, and groundwater in this region? What are the overall impacts from human water withdrawals and altering of aquifer capacity, topography, and runoff? How

will local development impacts combine with climate change impact predictions of less snow pack, earlier spring runoff, and lower late season flows? Mike is concerned that municipal, provincial, and federal governments still turn a blind eye towards cumulative development impacts. In his experience, short-term industry interests are still over-weighted in decisions and we are taking more from our life-giving rivers than can ever be recovered.

It's time for Alberta to set sustainable limits on development impacts to our water resources. Local and provincial governments need to be adequately informed on surface and groundwater resource capacities and risks. To meet this need those having or seeking licenses that affect water resources should collectively provide adequate

funding for independent, comprehensive delineation and monitoring of groundwater and surface waters as well as in-stream flow needs assessments. As a precautionary measure, gravel operations should be phased out of river floodplains. Despite Alberta's commitment since at least the mid-2000s to a cumulative effects approach to land and water disturbance through the Land-use Framework, the regulatory process still proceeds project by project. Under-resourced landowners still find themselves burdened with the task of demonstrating why a project should not proceed. Neither the province nor municipalities understand and manage cumulative effects in a way that our water resources merit. 🌱



ORVCA co-founder Mike Northcott beside the one kilometre long ex-gravel pit, now filled with water, that was grandparented (exempted) from stronger reclamation rules introduced later. PHOTO: © C. CAMPBELL

In November AWA was privileged to bestow Wilderness Defender Awards to Gus Yaki and Tom Maccagno. Vivian Pharis and Brittany Verbeek prepared the following tributes to these magnificent friends.

# Tom Maccagno: Champion of the Wild

By Vivian Pharis, AWA Board of Directors

“In this province, everything has a for-sale sign on it. But wilderness is like a cathedral. You don’t look for it to have another purpose.”

Tom Maccagno

*Wild Lands Advocate* editor Ian Urquhart gave Tom Maccagno the moniker “Champion of the Wild” when Tom’s eulogies were posted in the February 2012 issue of the *Wild Lands Advocate*. Anyone who knew Tom would recognize how applicable it really is. AWA regrets missing the opportunity to interview Tom in person about his remarkable life in Alberta’s north and bestow him in person with a Wilderness Defender’s award. Posthumously, Tom joined other notable wilderness enthusiasts and conservationists as a Wilderness Defender at AWA’s 2014 awards ceremony.

Thomas Maccagno was born and lived his entire life between Alberta’s 53rd and 55th parallels, although his parents had immigrated to Lac La Biche from faraway France and Italy. From early on, Tom’s intellect was evident and he was the first Lac La Biche citizen to gain a law degree. Although Tom practiced law all his professional life, both in Edmonton and later back home in Lac La Biche, his heart



Tom Maccagno

pulled him in other directions, but particularly towards the bush and all things wild and natural. At heart he was a scientist, a historian, and an adventurer.

A voracious reader and irrepressible student, Tom needed only a slight trigger of interest to send him down the road to proficiency in some new area. On one occasion that trigger was his discovery of a tiny, exquisite orchid in an area of local bush. Soon Tom knew as much about Alberta orchids, rare and common, as any trained botanist, and he became known for his orchid quest and defending their habitat.

But, being a lawyer helped to hone Tom’s sharp mind, to keep it focused, and gave him oratorical powers that stood him in good stead, especially when he argued in support of land, water or wildlife protection. He could be a formidable opponent to those wanting to log, build roads or

wellsites, befoul the waters or otherwise inflict damage to landscapes like those around Lakeland, Lac La Biche’s shores, sensitive bogs and fens or sites of historical interest. Woe could befall an unsuspecting industry representative or civil servant who was unprepared for a meeting or sloppy with his facts. When a defenseless human, orchid, lake, fish or pond needed his help, Tom could unleash such a torrent of rhetorical and scientific skill as to close further debate. Otherwise, Tom was as gentle, quiet, and unassuming as a *Habenaria obtusata*; he was a remarkable observer of and teacher about nature, a loving husband and father, and a wise and caring friend.

Tom’s wife Annette, feels Tom’s appetite for reading, learning, and acutely observing, promoted his analytical thinking and led to his concern some 30 years ago, about where the unbridled development of the Athabasca tar sands could take the local area and how it could affect not only Canada, but beyond. He had favourite haunts and would return to them year after year, sometimes noting alarming changes. Climate change also concerned him that far back when almost no one else in Alberta had even heard the term. His son Morris, referred to his Dad as a “lonely pioneer”- someone ahead of his time in seeing the need for conservation and protection in the face of a changing climate and the expanding human footprint. But, he could count as friends, such notable professors as David Schindler and Doug Hutton, with whom he undoubtedly, fruitfully, discussed his various concerns.

Following retirement from his law career, Tom devoted greater efforts to conservation but he was now also able to delve deeper into another long time interest, that of the local history of the Lac La Biche area. Enthused by the rich stories of the brave and independent men of the fur trade, Tom soaked up their adventures and retold their tales from the perspective of an admirer. He authored various articles in a number of journals such as *The Beaver*, about Lac La Biche and its early mission, and, of course, about the fur trade that spawned the line of forts down the Athabasca-Mackenzie River system, like McMurray, Chipewyan and Simpson.

Tom served Lac La Biche as its mayor for several terms in the 1990s. But, undoubtedly he will be remembered most for his tireless work on behalf of a host of associations and environmental groups. A life-long supporter of preserving the nature and beauty of the Lac La Biche and Lakeland area, he was also instrumental in gaining formal protection for the Garner fen, an area of uncommon boreal orchids. A contributor to the Alberta Parks book *Orchids of Lakeland*, he also reported on other rare plants in the region. The islands in Lac La Biche were protected within Sir Winston Churchill Provincial Park through his ef-

forts. Now, fittingly, one of those islands is to be named in Tom's honour. Other awards in his name include an Alberta Achievement Award for Preservation and Conservation, an Emerald Award, Canada's Recreational Fisheries Award, Queen Elizabeth II Golden Jubilee Medal, and Canadian Environmental Conservation Gold Award. No doubt he was especially pleased to have been made an Honourary Elder of the Beaver Lake Cree Nation.

Now Tom will be further recognized as an Alberta Wilderness Defender – another appropriate tribute for this extraordinary Albertan. 🌲

# Gus Yaki:

## AWA Wilderness Defender

By **Brittany Verbeek**

Walking an hour to grade school from his family's farm thirty-five miles north of North Battleford Saskatchewan, little Gus Yaki had time to let his mind wander and nurture his curiosity about the natural world around him. "I observed the many flora and fauna along the way and began recognizing them without knowing their names," Gus said. As he recalled trips he had done later in his life to East Africa with its unbelievable diversity and richness of species – I couldn't help but think perhaps those walks as a child held the same fascination and wonder. His time spent in rural Saskatchewan set the foundation for what would become Gus's life-long passion for wildlife. And one thing I have learned about Gus in the short time I have known him is he has a tremendous ability to turn any location into a fascinating natural history lesson.

His first taste of Alberta was a six-month stint in Edmonton, waiting to turn eighteen before the Royal Canadian Mounted Police (RCMP) could enroll him into the force. After his acceptance into the RCMP, Gus trained for nine months in Regina instead of the usual six months because his squad



Gus Yaki and his "class" at AWA's Summer Kids Camp  
PHOTO: © C. OLSON

was selected for a special task. It was 1951. The then Princess Elizabeth, now the Queen of England, and Prince Phillip were touring Canada and Gus's RCMP squad was required to perform a fifteen minute physical training session for the royals. "My specialty was to do fifty back flips!" Gus recalled with a chuckle. He said he would break his back attempting to do one now, but as a young

man he succeeded this acrobatic marvel. That's not to say he doesn't still do metaphorical back flips when he spots a rare bird or wild flower during his many outings.

After two and a half years of service in the RCMP, he worked for several other organizations in Ontario including Trans Canada Airlines (now Air Canada) and General Motors Canada. However, no matter where Gus lived or what he was doing, his love of nature never wavered. In the 1960s Gus lived in Lindsay, Ontario where he was President of the Victoria County Nature Club from 1962 to 1964. When he moved to Niagara Falls and realized there was no nature club there, he began one. Within one year they had over 400 members, which got the attention of the Federation of Ontario Naturalists (FON). Soon he was a member of FON's Board of Directors, and eventually was contracted to work for them. One of his assignments was to run their outdoor trip program. This led to him starting up Nature Travel Service, Gus's own eco-tour company. Over the span of thirty years running tours, he personally visited over seventy countries. When asked his favorite place he replied

very politically “whatever place I happened to be at the time.”

Gus met his wife Aileen on one of his international trips. They have shared the joy of nature’s best treasures with each other, and many others, throughout the years. Upon his retirement in 1993, he moved to Calgary where Aileen had lived since 1950. Gus quickly became involved with Nature Calgary. About ten years ago, he started a series of 12-week spring, autumn, and winter birding sessions for the Friends of Fish Creek Provincial Park Society. What started as one group of twelve participants, grew to become twenty-one groups of over 240 participants by last spring. These course participants faithfully come out once a week as Gus and his assistants lead them through different natural areas within the city. “I technically retired 21 years ago but most of my days are filled with an outing in the morning, often a visit to a school classroom in the afternoon, and giving a slide show or attending various meetings in the evenings. I also spend a lot of time answering nature-related questions sent by email.” He remains a very busy and much sought after man.

Surprisingly Gus never had a formal post-secondary education in biology or any related fields. His seemingly endless biological knowledge is both self taught and also learned informally from various par-

ticipants, including participating professors and other experts, on his many trips. Although he himself is an inspiration, Gus told me of several people or naturalists that have made an impression on him over his lifetime. The first was one of his teachers, Kathleen Nouch, who owned a small bird book “which she generously allowed us to peruse at recess time.” The second inspiration appeared in 1942, when a Yorkton, Saskatchewan woman named Isabel Priestly inspired the very first newsletter publication of “The Blue Jay.” A modest nature-related quarterly production, costing 25 cent a year back then, has now celebrated over 60 years of publication and can be found in reference libraries all across North America and abroad. Gus has every single issue. Helping to produce those first issues was Dr. Stuart Houston, now a retired radiologist in Saskatoon, and author of the soon-to-be published, two-volume, *Birds of Saskatchewan*. Bruce Falls is another of Gus’s personal inspirations. As a professor of biology at University of Toronto and president of Federation of Ontario Naturalists, he led the way to the establishment of the Nature Conservancy of Canada. Roger Tory Peterson, author of the first modern field guide “A Field Guide to the Birds,” and Robert Bateman, world-acclaimed wildlife artist and activist – have both greatly impressed Gus. Both have been

participants and/or co-leaders on his tours.

Gus Yaki, without mention or fanfare, deserves to share the stage with these other environmental champions. His entire life has been dedicated to learning and experiencing the natural world, sharing his wealth of knowledge, and inspiring others to value the wonders of Earth’s biological systems. “Unless people learn to love and appreciate the natural world around them, they are not going to stand up to protect it.” He is driven to teach people what species we have already lost and what humans stand to lose if we continue on this path to less and less biodiversity.

I’m sure with his passion, persistence and good-natured personality that everyone who has met Gus has a favourite story to tell – one that makes you smile! I have only personally known him for the past year since I began with AWA but my favourite ‘Gus moment’ was during a nature walk he led for the children participating in AWA’s summer kids’ camp in August. We didn’t have to go far for the kids to be amazed at every plant, bug and bird that we came across. When we returned to the building, he announced to us all that it was his 82nd birthday. He leaned over and said to the kids, “If you go out for walks in nature every day, like I do, you will reach the age of 82 like me!” 🍌

## Lisa Kozokowsky - Featured Artist



Oasis, 60x20, encaustic/oil, PHOTO: © LISA KOZOKOWSKY



Lisa Kozokowsky - Featured Artist



*Harvest Ready,*  
11x14,  
oil on gold leaf,  
PHOTO:  
© LISA KOZOKOWSKY

*Aerialscape 1,*  
24x48,  
encaustic/oil,  
PHOTO:  
© LISA KOZOKOWSKY



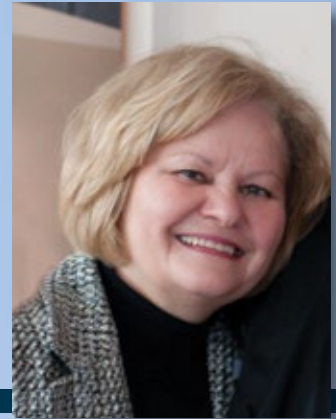
*Modern Prairie II,*  
24x48,  
coldwax/oil  
PHOTO:  
© LISA KOZOKOWSKY



*In Heaven As On Earth,*  
60x72,  
encaustic/oil  
PHOTO:  
© LISA KOZOKOWSKY



# Wilderness for Tomorrow - or How Many Bucks Does it Take?



By Christyann Olson, *AWA Executive Director*

**W**inter is settling in as we approach the longest night of the year. As we get ready for the holidays it's time to remember our good fortune. That fortune includes our wild spaces and, for me, the dedicated staff and volunteers I work with daily to help your AWA pursue a diverse and healthy wilderness legacy for future generations of Albertans.

Conservation success depends on all of us, on our awareness and conversations, on our passion for landscapes and wildlife, and our ability to devote time and resources to conservation campaigns. As we close the year we pause to reflect and document our progress.

I had a call from a member a few weeks ago that still troubles me. He feels strongly that we are not making any progress, that our work isn't showing progress on the map, that there is no concrete measure of what we have achieved. While I share the frustration I also believe the relationships we try to

build, through initiatives as varied as the Sage Grouse Partnership, the Summer Kids Camp, or the Climb and Run for Wilderness, will bear fruit in the long run. Through our efforts we'll change people's attitudes and that will ultimately change what the map of Alberta looks like.

The promise of progress in the long-run already has been seen in Alberta. Hay Zama delivered it well. In 2008, we were fortunate to move forward and celebrate the twinning of two vitally important international Ramsar sites, Dalai Lakes in Inner Mongolia and Hay Zama Lakes in northwest Alberta.

The conservation success embodied in Hay Zama Lakes began in the 1960s. The path to success was one marked by disagreement, negotiation, communication, cooperation, and finally collaboration. It is a story where dedicated professionals, First Nations, and conservationists believed in and found a better way to extract the area's petroleum and

protect the precious wetlands that migratory birds and resident wildlife depend on so heavily.

The tastiest fruit from this model of commitment and collaboration, one that already has delivered a Wildland Park, will be delivered in time for AWA's 50th birthday in 2015. All oil and gas activity in the park will end then – two years earlier than we had expected.

This model and the successes it's delivered inspire us to try to build similar understandings in other parts of Alberta. It gives us hope and belief that, despite the hard days for conservation, we will be able to work with others and realize our natural vision for Alberta.

Your donations and our fundraising events such as the Gala and the Climb and Run for Wilderness, are vital to the health of AWA.



They provided a remarkable 90 percent of our revenues in our 2013-14 fiscal year. The long-term financial stability needed for AWA to be strong is less of an issue this year and we are in good position as we save to purchase the Hillhurst Cottage School building in June 2015. Our day-to-day work depends on your generosity. Your generosity and our continually declining dependence on grants and foundation funding permits us to continue working to build financial security. That

effort and the security we have in place allows our staff to work freely, pursuing every possible lead, facing every challenge and developing expertise to represent AWA and its members with conviction and well-researched, sound arguments. Above all, however, members must know with absolute certainty that we care, that we will take a stand, and that we have hope for what tomorrow will bring.

Wild Alberta means many things to our members. For you, it may mean a sustainable

economy, or a place to challenge your stamina or nurture your spirit, or a secure, bountiful supply of life-giving water. Regardless, the interest and support of AWA members and supporters is what helps us make a difference every day. Thank you! If you haven't made a donation this year, no matter how large or small, please consider giving now. The form inserted in this copy of the *Wild Lands Advocate* has the details you will need.

*Christyann*

### **Gifts In Memoriam 2013 - 2014**

AWA is honoured and grateful to have received gifts in memory of the following supporters during the past year.

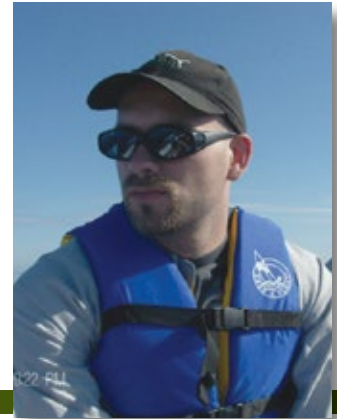
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# Cows as Stewards:

## Hyland Armstrong's AWA Talk

By David Robinson



**A**lberta Wilderness Association invited agrologist and range ecologist Hyland Armstrong to present at the AWA office on October 7. His talk, titled *Cows as Stewards: Managing Landscapes for Biodiversity*, discussed some of the complications imposed on grasslands as a result of cattle behaviour and how cattle can be managed sustainably to ensure the conservation of grassland biodiversity. Now retired, Armstrong was a ranch manager for over 30 years near Cypress Hills in southeast Alberta in the Dry Mixedgrass Subregion and a long-serving AWA board member. This region is home to many species at risk and water can be scarce, so grassland health must be carefully managed. Armstrong's presentation was a bountiful

blend of scientific and technical information and entertaining personal anecdotes about being a third-generation rancher, becoming a range ecologist, and interacting with academics and ranchers on the topic of landscape management.

Armstrong began by stressing the importance of biodiversity – the abundance of species and individuals in an ecosystem. Rangelands are home to a swath of natural processes including soil formation, nutrient and energy cycling, and water purification. Actions of (and interactions between) species in a rangeland are important for maintaining these processes. So a loss of biodiversity in a region could potentially jeopardize, for example, water and soil quality or reduce habitat available for native species.

Hyland spent the bulk of the presentation discussing how livestock behaviour may affect biodiversity in a rangeland. These behaviours are not limited to removal of grasses by grazing, but also include landscape trampling and contamination of water systems through cattle waste. There is nothing necessarily unique about ecological impacts of cattle, according to Armstrong; it is just a form of disturbance and, like any disturbance, can be managed sustainably.

In addition to being mindful of sustainable stocking rates, one of the key methods for sustainable range management is controlling the distribution of livestock. Cattle are fond of watering holes and rubbing posts and tend to congregate in areas where these are found. This can result in numerous problems. High livestock densities facilitate spreading disease among cattle and overgrazing of grassland, which will cause a long-term reduction of nutrients available to cattle over successive grazing seasons. On top of that, contamination of a pond or creek by cattle waste will result in blooms of algae, lowering water quality for livestock, fish, and wildlife and furthering the potential for disease.

Armstrong encourages the use of attractants and regular reinforcement to prevent congregating behaviour. Constructing watering holes with solar-powered pumps to draw water away from ponds and creeks will attract cattle, which will reduce water contamination and lower the risk of trampling sensitive wetland bird nesting sites. Salt and dust bags (an insecticidal device cattle will rub to kill biting flies) can be placed in desired grazing locations to encourage cattle to feed some distance



*Are you suggesting I sometimes may be a threat to water quality?* PHOTO: © C. OLSON



*Managing grazing lands for biodiversity benefits wildlife, cattle and ultimately the ranchers.* PHOTO: © H. ARMSTRONG

from watering holes. Most importantly, he stressed that cattle have to be conditioned into a routine for this to be effective. Leading cattle away from watering holes to where salts and dust bags can be found on a daily basis teaches them to keep moving to these grazing sites during their daily routine.

Are these methods effective? Hyland summarized two projects in which he collaborated with ranchers, the Alberta government, and environmental stewardship organizations to implement sustainable management strategies for improving rangeland health and grazing capacity on leased lands. Employing the strategies outlined above over four years saw a marked improvement in rangeland health, including energy and nutrient production, water quality and soil quality, and an overall increase in range grazing capacity. These results are important evidence that ranchers can experience direct benefits from sustainable practices.

Unsurprisingly, such practices will benefit wildlife as well. Keeping aquatic systems free of trampling and waste will be a boon to fish, amphibians, and nesting birds in those areas. Of particular importance are cattle interactions with elk, as they share the same landscapes and forage. However, the two animals do not necessarily have to compete

as their grazing behaviours differ. Elk tend to graze on grasses mostly during the winter season and only in areas where cows have been absent for some time. If cattle are always on the move and elk numbers taken into account when calculating stocking rates and densities, competition between them can be greatly reduced. One of Armstrong's aforementioned projects aimed to improve winter elk range, which succeeded over the four years of sustainable practices.

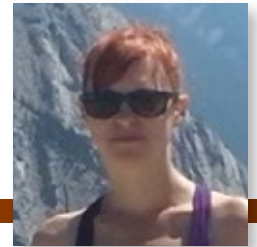
Things are not so simple for the endangered greater sage-grouse, however. Hyland hoped to improve sage-grouse habitat and populations in his second project, but this goal was not successful. He strongly suspects this was due to the project's relatively small scope. A single sage-grouse will travel several kilometres for brooding, breeding, and overwintering sites, so improvements in sage-grouse populations likely need a large network of intact landscapes of up to thousands of acres. Long-term establishment of sustainable practices by multiple neighboring ranchers would be required to improve sage-grouse numbers.

It is easy to wonder why these practices are not more widespread if they can provide wildlife and ranchers with these benefits. That answer was offered during the question period after the talk. Micromanaging cattle

this way is a lot of work. Ranchers are often busy tending to other tasks in their business and some may be concerned with costs of hiring workers to install water troughs and move cattle. Some ranchers are reluctant to deal with environmental stewardship groups, as their involvement means regular surveying on their grazing lands. As with any other scope of human activity, some also find it difficult to change from traditional methods that have been in place over several generations.

Hyland maintains that range management is complicated because ranges are complex. There are many variables to consider and they never interact linearly. Much of what we know today is the result of trial and error experimentation. Armstrong hopes ranchers will show leadership and acknowledge the ecological and economic impacts associated with current cattle management. Ranchers tend to trust their fellow ranchers. As more ranchers experiment and succeed with sustainable strategies, and communicate the economic benefits to others, such practices become more widespread. AWA is very grateful to Hyland for sharing these important examples of grassland management strategies that can significantly benefit both ranchers and wildlife. 🍀

# Gear Ideas - A Late Autumn Obsession



By Kristina Vyskocil

Late autumn/early winter in Alberta is layering weather. The MEC Obsession Hoodie (Men's) is one choice to consider as you plan to transition with the elements (\$145; 357g).

## What is the MEC Obsession Hoodie?

The MEC Obsession Hoodie is a men's medium weight synthetic mid-layer ideal for hiking, alpine climbing and ski touring.

## What does the MEC Obsession Hoodie do well?

While most insulated jackets are constructed from a tightly woven outer layer which limits breathability, the MEC Obsession Hoodie is a high-functioning technical garment constructed from multiple materials. The back, underarms, cuffs and hood are lined with fleece knit, a blend of polyester and spandex fleece with a brushed wicking inner and smooth outer surface: this material provides venting where its most needed. A combination of Toray Airtastic and Polartec Alpha lines the front core and upper arms to provide wind resistance and breathability where you need it most.

Toray Airtastic is a nylon and polyester woven fabric. The close weave of this windproof and water-repellent ripstop material is ideal for constructing garments which require excellent rigidity and high air permeability.

Polartec Alpha is an advanced insulated material originally developed for the U.S. Special Forces to regulate core body temperatures during both moving and stationary activities. Adjusting or shedding layers is not always a viable option, while pit-zips and vents can leave surface areas exposed to the elements. The low density fibre between Polartec Alpha's air per-

meable woven layers creates a fabric with superior breathability. What's more, the fabric provides all the warmth without the weight, making the MEC Obsession Hoodie more packable and fast drying than other mid-layers.

This garment not only functions as a mid-layer, but on warmer late fall days can also be worn as an outer layer: the fleece is covered with a breathable soft shell treated with durable water repellency. This means that the mid-layer is abrasion resistant, and able to shed light rain and spindrift.

The MEC Obsession Hoodie is constructed to provide generous coverage without being an oversized fit. Raglan style sleeves are fit for comfort under pack straps. A scuba-style hood, with a fold over chin-guard and internal storm flap behind the zipper, fits snugly to protect your chin and head while it comfortably slips under a helmet. The bottom hem, resting at the hip, adjusts with a drawcord to seal warmth in and cold, damp weather out. A single external chest pocket is the perfect size to hold a map or mid-activity snack.

## What are some drawbacks of the MEC Obsession Hoodie?

Like all the other insulated synthetic mid-layers, the MEC Obsession Hoodie is not treated with an antimicrobial. This means that, with prolonged use, the garment is not resistant to bacterial growth or odours. To keep the MEC Obsession Hoodie in top form, wash with a protecting cleanser like No Sweat Fragrance Free Sport Wash to neutralize odours and lift stains (\$8.75; 500ml).

## What's the bottom line?

The MEC Obsession Hoodie is a triple stack of warmth, breathability and venting, with a water-shedding finish to top it all off. This means you can comfortably play in piles of golden leaves, and the banks of deep snow that will soon replace them.

*Kristina currently works at Mountain Equipment Co-op and is in the final year of her English B.A. at Grant MacEwan University.*



# Fall Events

## Annual AWA Lecture and Awards Evening

*Martha Kostuch Wilderness and Wildlife Lecture*

“Legislating Conservation: Challenges and Opportunities”  
Presented by Dr. Ted Morton

Dr. Morton has been invited to speak about his vision that led to the Land-use Framework and province-wide planning process. A vision for conservation and meaningful on-the-ground planning for our legacy of wilderness and wildlife is part of AWA's vision and mandate and we expect Dr. Morton will challenge us as he reviews the process, the reality and the difficulty in legislating conservation.

The Alberta Wilderness Defenders Awards will be awarded to **Tom Maccagno** and **Gus Yaki** and the Great Gray Owl Awards will be presented to **Heather Crone** at this evening of celebration.

**Location:** 455 - 12th St. NW Calgary, Alberta

**Date:** October 31, 2014

**Time:** Reception 6:00pm • Lecture and Awards 7:00pm

**Cost:** Members \$50 • Non-members \$75

Reservations required, space is limited

## AWA Annual General Meeting

**Location:** 455 - 12th St. NW  
Calgary, Alberta

**Date:** November 1, 2014

**Time:** 11:00am

## Edmonton Talk: Fishing in Argentina with Bruce Dancik

**Friday, November 28, 2014**

Join us as AWA and friends kick off a “Wilderness Around the World” speaker series in Edmonton!

**Location:** Jackson Power Electric Ltd.  
(9744 - 60 Avenue, Edmonton)

**Time:** Doors open at 6:30 p.m.  
Talk starts at 7:00pm

**Tickets:** \$5.00

## Music for the Wild

**Saturday, December 6, 2014**

### Headline Act

**Jim & Lynda McLennan**

A Jim and Lynda McLennan performance includes instrumental fingerstyle guitar pieces from Jim (many from the Western Canadian Music Award-nominated CD, *Six-String Gumbo*) and vocal tunes from Lynda (many from the recent *Dancing On Air CD*). Their repertoire includes old standards and contemporary compositions, and is delivered in a unique style best described as “folk-jazz.” Seasoned performers, their genuine and engaging stage demeanor immediately puts audiences at ease.

### Opening Act

**The Hot TimAlis**

Tim Fraser and Alison (Ali) Laberge are **The Hot TimAlis**, and have been making music together since 2006, hosting for several years the wonderful Saturday evening sessions at The Cabin Cafe. Tim and Ali alternate lead vocals and harmonies, while Tim plays acoustic guitar and weaves a melodic background. Ali combines percussion with her lively and bright presence. They are fun, energetic, and always musical, and feature a remarkable and eclectic musical repertoire of favourites.

**Location:** 455 – 12 Street NW, Calgary

**Time:** Doors open at 7:00 p.m. Music at 7:30pm

**Tickets:** \$20.00

For more information and registration: [www.gowildalberta.ca/shop](http://www.gowildalberta.ca/shop) or 1-866-313-0713

\*\*\*Pre-registration is required for the Annual Lecture and Awards and recommended for all talks.

Sage-grouse have been endangered for many years but governments have done very little to eliminate human disturbances in critical sage-grouse habitat.



[www.AlbertaWilderness.ca](http://www.AlbertaWilderness.ca)

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