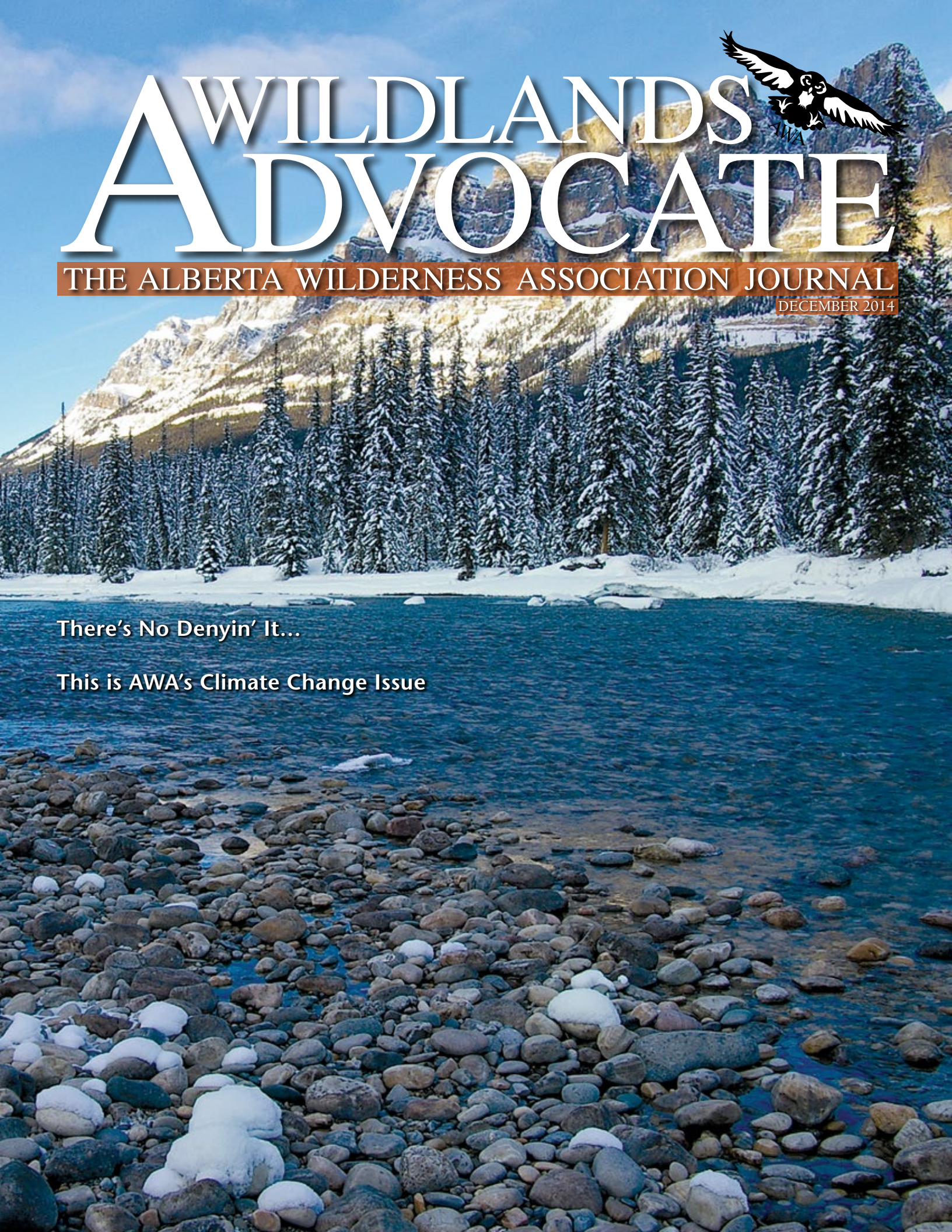

WILDLANDS ADVOCATE

THE ALBERTA WILDERNESS ASSOCIATION JOURNAL

DECEMBER 2014

There's No Denyin' It...

This is AWA's Climate Change Issue

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Who says winter is a time to flee to southern climes? Dan Olson's photo of the Bow River and Castle Mountain emphatically shows what those snowbirds are missing.
PHOTO: © D. OLSON

Featured Artist: Connie Beattie

Connie, an AWA member whose painting "The Bear Necessities" featured in September's Wild West Gala auction, loves to infuse her paintings with unexpected colors. Her paintings start with black and white photographs for reference. Then, drawing on the colors that come from within her, she crafts works that mix realism with imagination, realism with fantasy.

Connie cannot express in words the magnificent kaleidoscope of colours she sees daily. She instead tries to express her feelings with paint and canvas. She hopes her paintings may inspire us to look at our world a little more closely and appreciate more of the stunning beauty of this place. Amen to that.

Connie may be reached at conniebeattieart@gmail.com. Her website is www.connie-beattie.artistwebsites.com.

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Did 2014 Feel Like…

the warmest year ever? It likely should have according to data just released by two U.S. government agencies: NASA and the National Oceanic and Atmospheric Administration. Climate scientists there told the world that 2014 was the warmest year on record since temperature records began to be collected in 1880. *Forbes*, the U.S. media firm that describes its products as "Information for the World's Business Leaders," went further and published for those leaders the view that 2014 probably was the warmest year in the last 1,700 to 2,000 years.

Skeptics, of course, had a different take on data showing that the 20 warmest years all have occurred in the last…20 years. Or that nine of the 10 warmest years on record have occurred since 2002 (the tenth year was 1998). They warmed to the thought that NASA and the NOAA couldn't be 100 percent certain that 2014 was the warmest year ever. It might not have been any warmer than 2010 or 2005. Cold comfort? I think so.

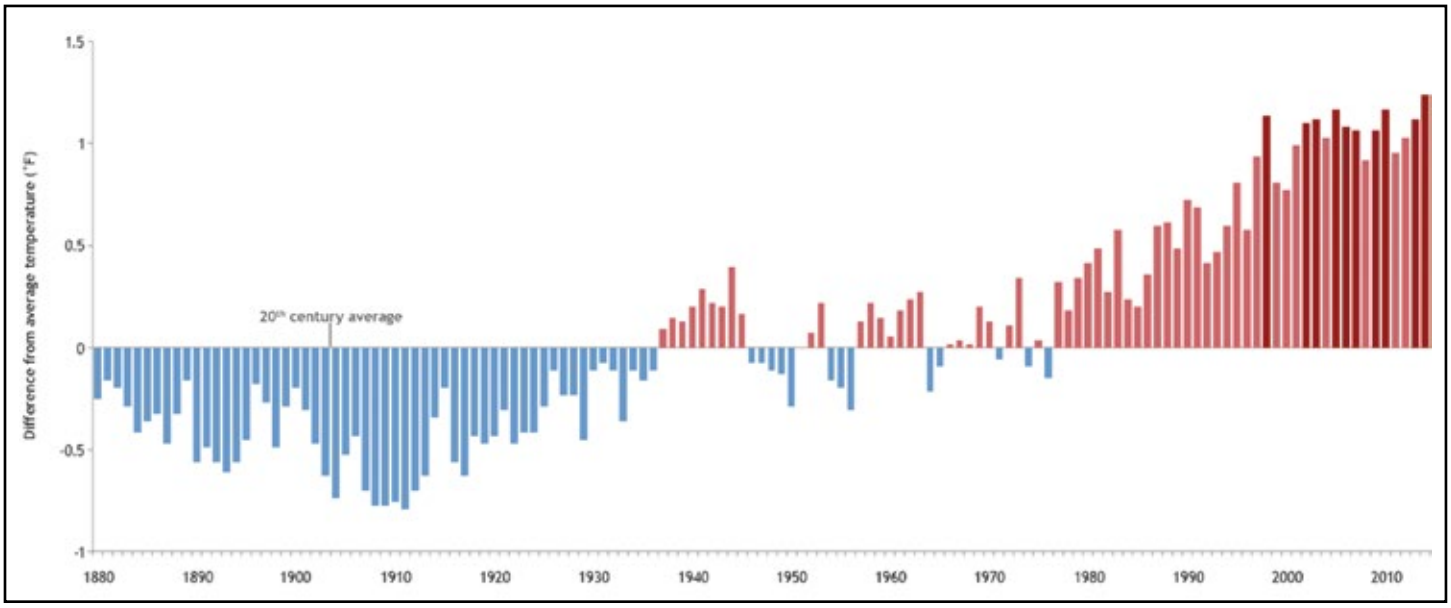
This issue of *Wild Lands Advocate* offers you a wealth of information related to the climate change. We begin with Dr. David Reid's account of the explanations, consequences, disbelievers, and prescriptions related to climate change. Lindsey Wallis next focuses on Alberta and what climate change means for managing biodiversity here. AWA's Vivian Pharis, a force of nature if there ever was one, gives us her impressions of another force of nature's impact on a Calgary audience last fall. Naomi Klein would be that other force.

Wondering where the public as well as those close to the petroleum industry stands on the issue? My article on climate change survey data offers some preliminary thoughts on that question. David Robinson looks at the proposals to mitigate flood events like the 2013 Bow River flood – an event many have linked to climate change. Niki Wilson devotes Conservation Corner to examining what a changing winter means for the terrestrial organisms who are innocent bystanders as we change their climate. Reader's Corner features reviews of two books on climate change: Naomi Klein's bestseller *This Changes Everything – Capitalism vs. The Climate* and James Hoggan's *Climate Cover-Up: The Crusade to Deny Global Warming.*

Devoting this issue to climate change is our way of showing that AWA agrees with those who suggest it may be the most important challenge this generation faces. For my part, I also concur with the conclusion of Dr. Michael Mann as quoted in the *New York Times*: "It is exceptionally unlikely that we would be witnessing a record year of warmth, during a record-warm decade, during a several decades-long period of warmth that appears to be unrivaled for more than a thousand years, were it not for the rising levels of planet-warming gases produced by the burning of fossil fuels."

Welcome to the Anthropocene.

-Ian Urquhart, Editor



Data from the U.S. National Climatic Data Center showing annual temperatures since 1880 relative to the 20th Century average. Nine of the ten warmest years on record have occurred since 2002. CREDIT: NOAA CLIMATE.GOV

The Anthropocene Has Arrived

By David Mayne Reid

"Anthropocene: The era of geological time during which human activity is considered to be the dominant influence on the environment, climate, and ecology of the earth." *Oxford English Dictionary*

Four billion years of Earth's history shows that climates have always been variable. Ice ages interspersed by warm interglacial periods are good examples. Such events have been triggered by alterations in the quantity of solar radiation, meteorite collisions, plate tectonics, volcanic activity and global changes in ecosystems

Now a new factor is forcing climate change, humans. We are transforming the planet's geology. Humans have irreversibly modified the global biosphere, poisoned the oceans, increased soil erosion and salinity, decreased soil fertility, turned grasslands into deserts, and destroyed forests. Species diversity is rapidly declining and we are now in the midst of what Elizabeth Kolbert and others term the "Sixth Extinction." Over 30 percent of all species likely will be extinct by mid-century. These are planet-wide events. Human activities such as burning fossil fuels and deforestation have pushed us into the Anthropocene geological period. While some geologists object to the name Anthropocene, it is indisputable the planet has been altered on a huge scale and in a horrifyingly short period. Barring unexpected volcanic eruptions, a visiting meteor or some lunatic starting a nuclear war we are now in a sustained period of global warming.

The air above us, land beneath and vast seas are all warming. While this warming doesn't mean that every year is necessarily warmer than the preceding one, the upward trend is unambiguous. Warming began soon after the industrial revolution triggered increases in human population, overfishing, deforestation for agriculture, and increased pollution on a vast scale. The invention of machines to exploit coal, oil and gas allowed us to bend more of the planet to our will with increasing and terrifying efficiency.

Why are we getting hotter? What are the consequences? Why do climate change deniers say there is no problem? What must we do?

Why are we getting hotter?

Atmospheric concentrations of water vapor, CO_2, nitrous oxide and methane are rapidly rising. These are called greenhouse gases (GHG) because they trap the heat in sunlight, analogous (not identical) to a hot greenhouse sitting in the sun. Some solar energy is absorbed by land and open water and re-emitted as warming infrared (IR). IR is trapped by GHG, where it heats the lower atmosphere, land, and sea. This is global warming. To convince yourself that there is considerable potential heat energy in sunlight, hold your bare bum against the paint of a black car that has been in the sun for two hours. After you get your bum burns tended by the doctor, you won't repeat the experiment.

Increases in atmospheric water vapor have not caused recent warming. Furthermore, excess water vapor tends to condense out of the atmosphere as precipitation. If warming increased atmospheric water content this could produce more clouds which trap heat causing warming, but clouds reflect sunlight, resulting in cooling. These effects may cancel each other out.

There is however an excellent positive correlation between rising quantities of other GHG and rising global temperatures. CO_2 concentrations and temperature track together extremely well. There are parallel and large global increases in methane and N_2O. Since other factors also affect temperature the correlations are not perfect due to: variations in the amount of solar energy, volcanoes spewing dust, aerosols and sulfur dioxide (SO_2), which block sunlight, leading to cooling. The Mt. Pinatubo eruption is a good example. However, volcanoes also emit CO_2 that would promote warming. In spite of these confounding influences, it is still clear that the rise of GHG is driving increased global warming.

A little GHG is a good thing and vital for life on Earth. Without a dash of GHG acting as a nice warm atmospheric blan-

ket, Earth would be an uninhabitable ball of ice. CO_2 constitutes only 4 of every 10,000 molecules in the atmosphere, but excess GHG cause over-heating. We need just the right amount. If the percentage of carbon dioxide in the Earth's atmosphere rose to one percent from today's 0.04 percent - all other things being equal – the Earth's surface temperature would be lethally hot to most forms of life.

Normally the global CO_2 level is partially controlled by biological processes, balancing uptake by land plants and marine photosynthesizers with re-emission by soil microbes, animals, and wild fires. Some carbon also dissolves in the oceans and is used in the formation of shells of marine organisms that eventually sink to the sea bottom forming limestone. There are similar cycles with methane and N_20 and such cycles are the historical norm. Unfortunately humans are upsetting this delicate balance, pushing extra GHG into the atmosphere.

CO_2 concentration is now higher than it has been for 700,000 years and the industrial revolution is responsible for the recent rapid rise. In 1972, when I began research on the effects of CO_2 on plants, normal atmospheric CO_2 concentration was 340 parts per million (ppm). Now it is 400 ppm. The excess CO_2 largely comes from burning the oil, natural gas, wood, and coal we use in transport, manufacturing, and heating.

Together with increased emissions, we have less CO_2 sequestration because human activities have globally reduced the number of plants that absorb CO_2. Deforestation continues at alarming rates, tree diseases/pests such as the pine bark beetle are increasing, and we continue to convert wild lands and forests to agriculture. Unfortunately agricultural ecosystems trap less CO_2 than wild ecosystems.

Methane and N_20 come from various sources: industry and microbiological generation in cattle, rice paddies, fertilized and warmed soils. All of these have increased compared to the days before the industrial revolution.

Humans have significantly altered the composition of the global atmosphere in an astonishingly short time.

The consequences

Who is worried about climate change? To mention only a few; 97 percent of scientists working in the climate science field, the Pentagon, the CIA, many insurance companies, the Royal Society (UK), the Australian Academy of Sciences, the Royal Society of Canada, the American Association for the Advancement of Science (AAAS), NASA, NOAA and last but not least, the UN Intergovernmental Panel on Climate Change (IPCC).

Then there are moral and ethical beacons such as the Dalai Lama and Pope Francis. Although they are not scientists, they are men who think deeply about matters of global concern. Both urge governments to take immediate action on climate change. They join those mentioned above in recognizing that humans are significant drivers of this global warming which will lead to the following:

- Sea level increases, caused by melting of Arctic ice, glaciers, and ice caps (West Antarctic, Greenland) and thermal water expansion. Add to this we have increased intensity (and perhaps frequency) of extreme weather events, such as stronger hurricanes, and bigger tidal surges. Thus we get more coastal flooding. As much of the world's population lives on coasts this is serious.
- In coastal areas salt water is entering drinking water supplies and harming agriculture.
- Longer periods of severe drought, more wild fires burning forests and crops. Flash flooding inland will increase risks to homes, farms, infrastructure, and people. Food shortages and rising food prices are likely too.
- Species, including warm area pests, move into what were more temperate climes. The diseases they carry impact humans, wildlife, forests, and agriculture (ie. pine bark beetle, malaria, Lyme disease, diseases in muskox, Dengue fever)
- All these events will increase the likelihood of more hunger, more poverty, uncontrolled population movements, political unrest, terrorism, and war.
- Even if Earth were not warming, there is the enormous problem of CO_2-induced ocean acidification. Ocean acidity results from more CO_2 dissolving in seawater. This impairs the ability of marine organisms (plankton, shell fish, corals) to form carbonate structures. It will damage coral reefs, marine food chains and fisheries. Hundreds of millions of humans depend upon the ocean for food.

These consequences could get much worse, much faster

Polar icecaps are melting, and sea levels are rising, more rapidly than predicted, possibly due to "positive feedbacks." One example of a feedback is Arctic ice melt. Normally white ice and snow reflect sunlight back into space keeping us cool (the albedo effect), but when snow/ice melts, the darker water absorbs (not reflects) light, heats up, and yet more ice melts, causing accelerated polar heating.

Another example of a positive or reinforcing feedback is when warming tundra soils stimulate bacteria to produce methane. This GHG , more than 40 times more potent than CO_2 in the short term, traps yet more heat and liberates even more methane. Additional heat is trapped in this positive feedback loop.

Warming of the Arctic sea also will release methane from frozen methane hydrates, leading to another feedback. When such processes spiral out of control we may reach a "tipping point," rapid change where we would see a sudden jump from a cooler stable environment to a stable but hotter climate. Such new conditions would be exceptionally difficult to reverse.

The Climate Change Deniers

The Deniers have a disingenuous and selective approach towards scientific information. They accept the science that cures their diseases and is the foundation of computer technology, but reject the science showing that humans are the primary cause of recent climate warming. Many of The Deniers want to ignore the melting glaciers and ice caps. They argue the seas are not acidifying, nor are they rising, yet an immense amount of recent data shows the opposite. They are blind to the effects of massive changes in the chemical composition of our planet's atmosphere.

The Deniers cherry pick climate data. They embrace what they like and ignore that which confounds their beliefs. They exaggerate small inconsistencies whilst ignoring the vast bulk of growing evidence showing that we have a gigantic human-caused problem.

Over the years some of the denier groups have benefited from hundreds of millions of dollars of funding from the likes of ExxonMobil, Talisman, and the Koch brothers. They read climate science very selectively, possibly because it either contradicts their faith or may threaten the bottom line of their sponsors. They seem unprepared to accept the view of a "radical" organization such as the U.S. Department of Defense that climate change effects "are threat multipliers that will aggravate stressors abroad such as poverty, environmental degradation, political instability, and social tensions – conditions that can enable terrorist activity and other forms of violence."

By the way, on "belief", most scientists don't "believe" human activities are causing climate change. "***Belief***" – since it may be irrational – has nothing to do with it. Scientists look at the ***facts*** and come to ***rational conclusions*** based on that information: in this case the facts are clear, human or anthropogenic activities cause recent global warming.

Some deniers say illogical things like "the climate is always changing so this current change can't be human caused."

Or, "warming is primarily caused by the sun." Obviously the sun warms Earth, but there is no evidence that recent ***changes*** in solar radiation affecting Earth constitute the most significant driver of ***recent*** warming.

Then there was this claim: "Mann's graph (the famous hockey stick graph used by the Intergovernmental Panel on Climate Change in 2001) showing rapid warming over the last 150 years comes from falsified data."

Not so; Mann's work has been rechecked, and extended by many independent scientists. His original conclusions are correct. In fact, recent studies published in *Nature Science* and *Science* offer the most powerful support yet for Mann's pioneering work.

Another focus of The Deniers is the claim that "more CO_2 is a good thing. It is a plant food and bigger plants will absorb the excess CO_2." I'm afraid this thinking illustrates that a little knowledge may be a dangerous thing. True… CO_2 is plant food, photosynthesis absorbs enormous quantities of CO_2, and normally global CO_2 levels are controlled. But we all know a little food is good, but too much is bad. Actually very high levels of CO_2 are toxic and while a little more CO_2 promotes plant growth, the effect is short lived. Faster growing plants run out of other resources (water and minerals). Also, high concentrations of CO_2 reduce the ability of plants to absorb yet more CO_2. Some types of photosynthesis don't respond positively to more CO_2. The fertilizing effect of $CO_2$is limited.

Also, when The Deniers talk about CO_2 benefits, they tend to ignore the complex reality. In a warmer world some areas will be drier. My research with Mirwais Qaderi shows that a combination of heat PLUS drought reduces a plant's ability to protect itself against further environmental stress and, even worse for the climate, stressed plants emit methane. We don't need more GHG production.

Scientists search for truth and base their conclusions on evidence. The Deniers could learn much from them.

What must we do?

Promote a different type of democratic politics. Elect politicians who think beyond their next election. Governments must stop subsidizing Big Energy; our systems of party and election financing must change to eliminate donations from industry. Governments must stop muzzling civil servants who dare to speak about scientific information that clashes with the governing party's partisan tune.

Get off our addiction to oil, natural gas and coal. Legislate increased fuel-efficiency in vehicles and greener buildings. Promote and use public transport. Only buy small cars with low fuel consumption.

Promote renewable energy – if a leading oil-producing state like Texas can promote renewables shouldn't they be a significant part of Alberta's energy future? Ignore the self-interested arguments of Big Energy and Government when they say: "We can't do this yet. It is too expensive. The technology is not ready." This is not true. Solar panels should be installed on rooftops. The technology is available NOW. It can be done. *Bloomberg Businessweek* reported that, in the first half of 2014, Germany generated 27 percent of its electricity from renewables (excluding hydro). Promote installation of tide and wave electrical generators on our coasts. Develop hydrogen (which burns to form non-polluting water) as a clean energy source. Spend research dollars on artificial photosynthesis producing hydrogen and electricity from water. We have the drilling technology for more use of geothermal energy.

Yes, alternative energy will impact the fossil fuel industry, but that industry has a limited life-span. With their money, technology and resources they should lead the way reinventing themselves as suppliers of green sustainable energy.

Promote large-scale reforestation. Don't cut down forests and use the cleared land for biofuel or cattle production. A forest is much more use to humanity than ag-

riculture that produces cattle or biofuels. Capture CO_2 by increasing the area under forests, wild lands and grasslands. Photosynthesis has been efficiently capturing CO_2 for 3 billion years. It is suicidal to reduce this essential global service by willfully destroying grasslands and forests.

A growing human population adds to the pressure on resources and the environment. Our numbers must be controlled and reduced. The rich world must also downsize, since we produce 40 times more pollution (per capita) than those in underdeveloped countries. Here, the provincial government estimates that Alberta's population could nearly double from 4 to 7.3 million by 2041. Alberta's landscapes can't sustain that population.

When estimating the costs of developments like Alberta's oil sands, the accounting should include full long-term environmental costs. The loss of environmental services associated with this development is not adequately accounted for.

We must redesign our economic system to one where profit and the environmental sustainability are complementary, not contradictory. The longer we procrastinate the more costly it will be to make that transition. The assumption that a finite world can indefinitely sustain ever-increasing population, rising consumption and more pollution is mistaken and threatens our future on this planet. We must all act and it's imperative we act soon.

I don't enjoy concluding that humans are the greatest threat to the planet's ecosystems but my scientific education and training tell me that is today's reality. We had better deal with it now and stop sticking our heads in the increasingly hot sand.

David was professor in the Dept. of Biological Sciences at the University of Calgary until retirement in 2007 and was Head of Department 1999-2005. He came to specialize in plant ecophysiology and published over 170 refereed publications on subjects such as how plants survive environmentally stressful conditions.

Connie Beattie - Featured Artist

The Bear Necessities, 36" x 40", Acrylic on Gallery Canvas

Shifting ecosystems require shifting priorities:

Report addresses biodiversity management challenges in the face of climate change

By Lindsey Wallis

Alberta needs to adapt its biodiversity management strategy as our climate changes and ecosystems shift northward and upslope, according to a recent report by Rick Schneider. It posits that these ecosystem shifts need not reduce the biodiversity on Alberta's landscapes but we must change our way of thinking about biodiversity management and adopt more flexible management strategies.

An earlier report by Schneider (see summary by Carolyn Campbell in the February 2014 *WLA*) concludes that the average temperature in Alberta will increase by at least 2°C and possibly as much as 6.5°C in the next 50 years. Drier soils will accompany these changes. These climatic changes are expected to shrink the boreal forest, converting much of it, especially the Central Mixedwood Subregion, to Parkland and Grassland ecosystems. These drastic changes to Alberta's ecosystems mean we will not be able to continue our current strategy of management, which tries to preserve landscapes as they are today; this will become impossible as ecosystems shift in response to climate change. Instead, Schneider asks that we "reimagine what the goal of maintaining biodiversity means and how it can be achieved in a world of constant change… Gaining clarity around our conservation objectives is a critical prerequisite for developing and implementing meaningful adaptation measures."

Alberta's current approach to biodiversity management assumes that human disturbance is the only agent of long-term change on Alberta's landscapes. Schneider suggests that a more appropriate goal for biodiversity conservation would be to "maintain ecosystem structures, patterns, and processes (including species distributions) ***as they would be in the absence of human disturbance.***" (emphasis in original) Under this new interpretation, conservation efforts would continue to focus on preventing harm from human land uses but resources would not be wasted trying to mitigate the effects of climate change, which are inevitable and irreversible. "The status quo is unlikely to be maintained anywhere in the province, even under the least-change climate scenario…Efforts to maintain the status quo will become increasingly expensive and fundamentally misdirected as ecosystems shift in response to climate change." The report stresses that minimizing greenhouse gas emissions is still vital, but works under the assumption that some degree of change is inevitable no matter what measures we implement today.

He cites the Arctic grayling as an example: "Most populations of Arctic grayling in the southern parts of their range are in decline as a result of rising water temperatures, in combination with other factors (Walker, 2005). Under a static approach to conservation, increasing effort should be devoted to these southern populations because they are most at risk. An alternative perspective is that the decline in southern populations reflects a shift in range, and instead of trying to prevent this change, conservation efforts should be redirected farther north, where they will provide the greatest long-term benefit."

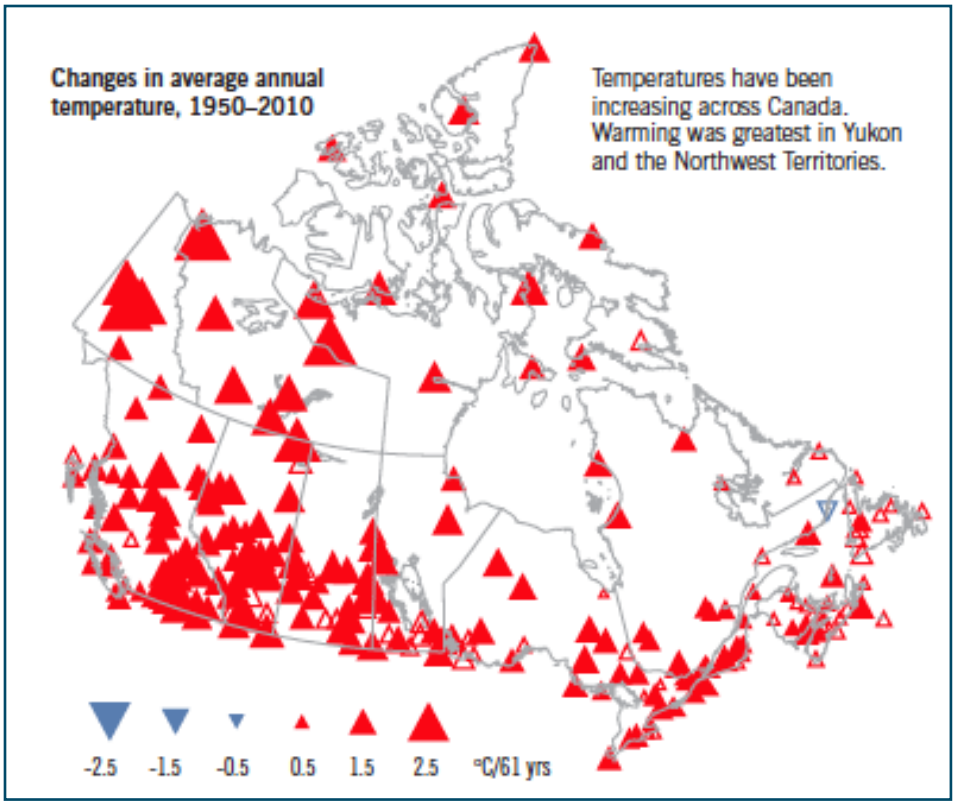
The report suggests that protecting habitat is still the best way to conserve biodiversity, even in a changing climate. "The rationale is that species will have the greatest capacity to withstand the challenges arising from climate change if they do not also have to contend with the stresses imposed by human disturbances…Fully implementing management strategies designed to minimize the impacts of human disturbances, such as integrated landscape management and cumulative effects management, is paramount." The challenge for Alberta is to ensure that the "full range of physical environments, including dominant landforms and climatic gradients" are protected. Connectivity between protected areas will also be vital to allow migration of species as habitats shift northward. According to the report, "Because the focus is on the 'stage' and not the 'actors,' the system is intrinsically robust to climate change." Schneider believes the regional planning system under the ***Land-use Framework*** is well positioned to respond to these needs. But the utter failure of the South Saskatchewan plan to protect critical habitat suggests he may be overly optimistic. Even the best frameworks demand political will and commitment.

The difficulty in identifying areas for protection arises in "objectively delineating physical environments." Schneider suggests: "It should be reasonable to use the Natural Subregion classification as a first approximation in areas where the boundaries are based on distinct landforms (e.g., Boreal Highlands) or unique soils (e.g., Athabasca Plains). However, Subregion boundaries that are based on changes in vegetation (e.g., Lower to Upper Foothills) will require additional analysis." The report goes on to say "(t)he weakness in this approach is that

biological systems are highly complex, and the linkage between management intent (e.g., maximizing biodiversity) and actual outcomes is often tenuous. Furthermore, management plans are rarely optimal from a biodiversity perspective because of trade-offs with other land-use objectives. A conservation approach that does not formally track ecological status over time, so that adjustments can be made when needed, is likely to lead to gradual declines in biodiversity that are never fully appreciated."

One of the biggest challenges for this approach is the need to add protected areas to Alberta's network so all ecosystems are represented. Schneider suggests this could be accomplished through the regional planning process, as was done in the Lower Athabasca Regional Plan. Another is the problem of connectivity between protected areas, which Schneider suggests could be mitigated with the use of riparian corridors. "Riparian zones are ecologically important linear features that traverse multiple ecosystem types, and can serve as movement corridors for a variety of species (Capon et al., 2013). Furthermore, the intactness of these corridors has been maintained in forested areas through forest management regulations."

Even with careful planning and management some ecosystems may virtually disappear from the Alberta landscape. According to the report, the Central Mixedwood ecosystem sits on the Climate Moisture Index near the tipping point between a forested or non-forested ecosystem. In addition, "the Climate Moisture Index is relatively uniform across much of the boreal plain, which means that very large areas can be affected by relatively small changes in climate." Another issue is that as old-growth forest in the Central Mixedwood is converted to grassland it won't be able to reestablish itself in new regions fast enough, creating a bottleneck for old-growth dependent species. The report goes as far as to suggest that "under the hottest climate scenarios it is doubtful that boreal old-growth forest would re-establish anywhere in the province." Although the Central Mixedwood would not be totally converted to grassland in the near-term, even under the extreme scenario, the future for species dependent on this habitat looks bleak.

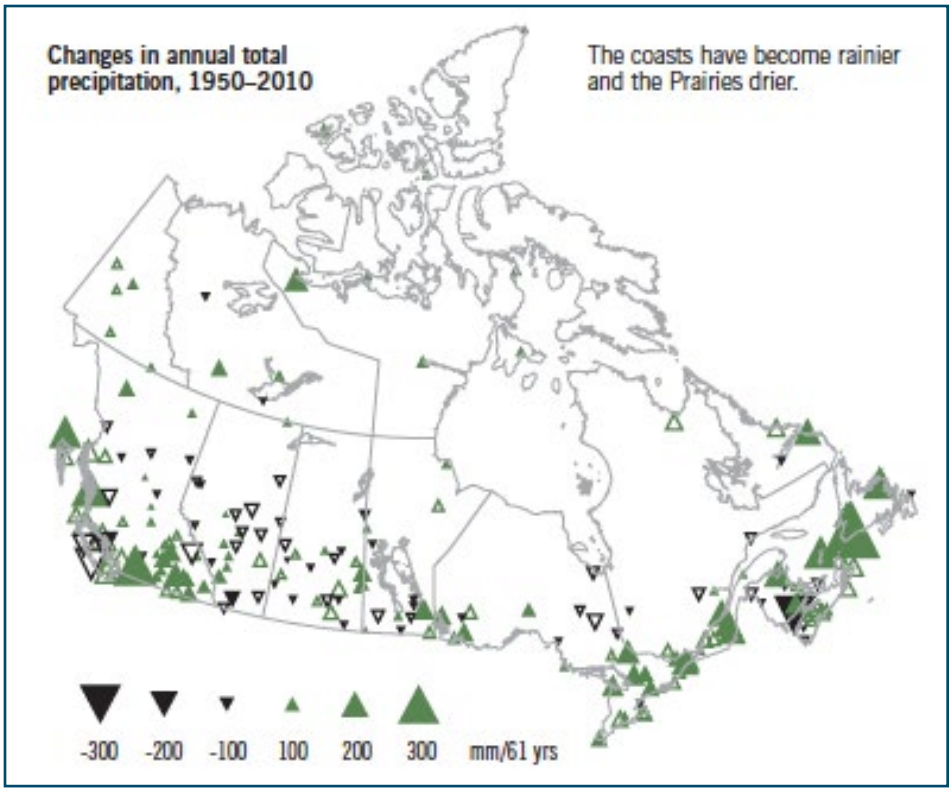


Canada in a Changing Climate: Sector Perspectives on Impacts and Adaptation, 2014.
SOURCE: GOVERNMENT OF CANADA

Protecting specific endangered species will become especially challenging as sites selected for protection of a single species may no longer represent critical habitat once ecosystems begin to shift. More resources will be required to monitor and redefine the baseline states for these habitats and to discover the new range and new critical habitat for these species as the climate changes and ecosystems steadily shift northwards.

While the expansion of the Grasslands ecoregion could be a saving grace for many species (more than 75 percent of Alberta's threatened and endangered species are found in the Grasslands ecoregion), the spread of grassland habitat could give rise to other threats. Schneider sees increased pressure from agricultural users for expansion into areas that are currently forested (Green Zone) but will change to grasslands as the climate warms. This is a particular threat if public lands are sold off as the government can no longer manage them for conservation. Schneider cites a paper by Carr et al. (2004), which suggests the possibility of moving agriculture further north in Saskatchewan. Also, the report states: "Near-term benefits to grassland species will be limited by the fact that the Central Parkland, directly north of the existing grasslands, has almost entirely been converted to agriculture."

The report argues that one of the biggest obstacles to incorporating climate change into conservation and land use planning is the uncertainty about the degree to which the climate will change and its effect on Alberta's ecosystems. "Under the least-change scenario for Alberta we can expect approximately 2°C of warming by the 2080s, but under the maximum-change scenario the temperature could rise in excess of 6°C (Schneider, 2013). In ecological terms, this represents the difference between northern Alberta remaining forested or converting to a grassland ecosystem. The large difference between these two extremes is mainly a function of alternative assumptions concerning how much additional greenhouse gas will be emitted globally in coming decades. It also reflects the fact that climate modeling is inherently complex, and different modeling



Canada in a Changing Climate: Sector Perspectives on Impacts and Adaptation, 2014.
SOURCE: GOVERNMENT OF CANADA

teams using the same input scenarios continue to generate different projections."

Schneider urges that we need to start planning now to have any chance of possessing the knowledge needed and having systems in place to respond to ecosystem changes as they begin to occur. In addition to completing and implementing Alberta's biodiversity framework, the report lists other required elements that have yet to be put in place. They include: "1) The establishment of additional conservation areas to fill gaps in representation, 2) the implementation of coarse-filter biodiversity indicators and targets that will be measured and managed for, and 3) the effective management of cumulative industrial impacts through integrated landscape management techniques and the implementation of regional land disturbance plans."

Schneider urges that, at these early stages, the most important action is the drafting of policy that "identifies the need for adapting to climate change and enables and promotes preparation across all levels of biodiversity management. Managers should have a clear mandate to begin incorporating climate change into management plans, undertake pilot studies and other relevant research, begin systematically monitoring the ecological effects of climate change."

Finally, the report suggests that "an evolutionary, rather than a revolutionary, approach to change is advisable." Moving too quickly could spark resistance from affected parties from conservationists to land managers and beyond.

In an email Schneider adds: "Adaptation to climate change presents a unique challenge. For some, it is too far away to worry about, for others there is a sense that nothing useful can be done. The reality is that, though there are no magic bullets, there are preparatory steps that can and should be undertaken today to smooth the inevitable transitions that will occur in coming decades. Rather than leaving climate adaptation to languish in our management inbox, it is time to begin integrating it into our management systems at every level."

The report was produced in support of the Alberta Biodiversity Management Institute's (ABMI's) Biodiversity Management and Climate Change Adaptation project, which is "developing knowledge and tools to support the management of Alberta's biodiversity in a changing climate."

A freelance writer and photographer, Lindsey loves tramping through Alberta's wild spaces, whether on foot, horseback or skis.

Connie Beattie - Featured Artist

Butting Heads, 10" x 15", Watercolor on Illustration Board

Naomi Klein in Calgary

By Vivian Pharis, *AWA Board Member*

One might think that a climate change activist, corporation lashing, anti-capitalist would be shunned in Calgary, vilified by its media, and met with howls of protest from vociferous climate change deniers. But not Naiomi Klein. They love her here and she regularly draws a full house when in town.

There is little doubt Naomi Klein is a Canadian icon. She's young, energetic, part of the revered Stephen Lewis clan and obviously very smart and articulate. Now, with several extensively researched and acclaimed tomes on aspects of modern society to her credit, her reputation as a serious writer is secure.

When she spoke this fall in Calgary, she had just won Canada's top award for non-fiction, the $60,000 Hilary Weston Prize for her latest book, *This Changes Everything*. Heinz Unger has written an insightful, critical review of this important work for this issue of the *Wild Lands Advocate*. Not everyone with their feet planted firmly in the realm of serious climate change thinking agrees with Klein's premises. In fact, *This Changes Everything* has sparked a cascade of divergent reviews. This is a reason why I bought a ticket to hear her in person. Naomi was invited to Calgary as part of the 2014 Wordfest and as part of her North American book tour.

Two friends and I were startled by the large throng squeezing through the doors of Knox United Church in downtown Calgary on October 21, when we arrived a half hour prior to the talk. The crowd's buoyancy and enthusiasm made us feel we were being swept into a rock concert. It was so encouraging to see the mix of ages in the audience with at least 50 percent being fresh, young faces.

It became obvious that part of the evening's draw was Alberta's own Andrew Nikiforuk, our energy guru who served as the evening's host and elicited the same enthusiastic applause and welcome as did Naomi. I found the presentation format refreshing. After Naomi's introductory remarks she and Andrew sat on chairs and the event became an exchange of ideas.

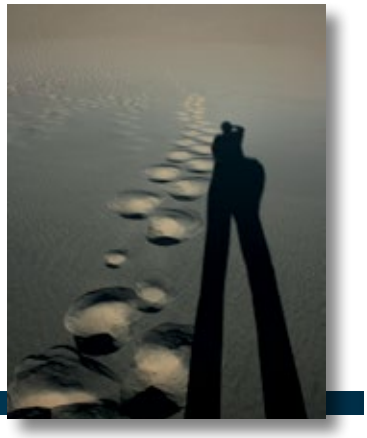
Naomi opened her remarks with a personal account of how, having finally given birth to a child at age 42, this wonderful event had changed and sharpened her thinking about the imperative of tackling climate change. The audience was captivated over the next hour by the wit and heartfelt interchange of ideas between two potent minds wrestling with one of the most critical issues ever to face humankind. Applause regularly punctuated the evening as some new idea registered with the crowd. When the format moved to audience questions, Naomi revealed herself to be as compassionate as she is intelligent – a chip off the Lewis family block, to be sure.

There was a lengthy standing ovation as a long queue formed at the book signing table. Snippets of conversation heard amongst a more subdued departing throng were dominated by ideas, serious ideas. What's a book or a talk for anyway, if not to generate ideas? This crowd left in a swirl of them. Let's hope her important ideas generate much needed action.

Naomi Klein CREDIT: ED KASHI

Climate Change:

And the Surveys Say?



By Ian Urquhart

Bernard Woolley: "Well the party have had an opinion poll done. It seems all the voters are in favour of bringing back National Service."

Sir Humphrey Appleby: "Well have another opinion poll done showing the voters are against bringing back National Service."

– from Yes, Prime Minister, Season 1, Episode 2
"The Ministerial Broadcast," British Broadcasting Corporation, 1986.

Interpreting opinion data, not least opinion about climate change, may demand a healthy dose of skepticism. The exchange above between fictional characters in the BBC series *Yes, Prime Minister* hints at one suspicion you might have when someone tells you a public opinion poll "proves" what the public really believes. Public opinion on any issue, such as national service or conscription into the military in the *Yes, Prime Minister* episode, may vary according to the questions the polling firm poses to survey respondents. How questions are worded matters. An organization wanting to use public opinion to justify its actions may be tempted to construct questions in ways that increase the likelihood the organization will get its preferred answers. So, if possible, check the questions posed in a survey whenever a self-interested organization reports the public supports its view of a problem and/or its prescription. Even when surveys are models of neutrality they may still use different language in their questions and these differences may spark different patterns in the public's responses.

Samples matter too. The sample of the public used in a poll also is important in affecting the credence we should give its results. Poorly constructed or biased samples and low response rates are good reasons for the public and policy makers alike to dismiss a survey's purported findings. For example, Brewster Travel Canada incorporated a marketing survey as part of its justification for its Glacier Discovery Walk project. Referring to that survey, the main body of the project's environmental assessment screening report told readers that "(r)esponses were strongly positive overall." It noted that 88 percent of Albertans surveyed said they would visit the Discovery Walk and 75 percent said they might travel to either Banff or Jasper National Park to visit it.

This language and these results seemed to suggest impressive public demand for the project. It shouldn't have been seen that way at all. The appendix where some survey details were reported revealed the sample was biased (the survey only was sent to subscribers to Explore Rockies and Brewster Vacations Canada) and had a very low response rate of six percent (only 474 of the 7,859 surveys were completed). Furthermore, no indication was made anywhere in the report of how many of the 474 respondents were from Alberta. The unsuspecting reader of the main body of the report might have been far less impressed if she had read "88 percent of Albertans who subscribe to tourism marketing emails from Brewster Vacations Canada said they would visit the Discovery Walk."

With these cautions, this article focuses, with one exception, on climate change polls reported over the last three years. It doesn't claim to look at every poll published on the subject. These polls are used here to gauge Canadian and Albertan opinion on two dimensions of the climate change issue: Is the climate changing? For those who believe the climate is changing, what's responsible for climate change?

The Climate – Do Canadians Think It's A-Changing?

Polls suggest a vast majority of Canadians believe what the scientific community reports. Earth's climate is changing. A widely reported poll by Insightrix Research con-

ducted in May and June 2012 suggested only two percent of Canadians did not believe the climate was changing. In late 2012 Environics polled Canadians about climate change. Environics approached this issue by asking Canadians if they believed the science was conclusive about whether or not global warming (as opposed to the term climate change) was happening. Eighty-five percent of respondents said the science was conclusive – global warming was happening. Twelve percent of the sample did not believe the science was conclusive yet on whether global warming was occurring.

In 2013 Angus Reid Public Opinion reported that 78 percent of Canadians felt global warming was a fact; 13 percent regarded global warming as an unproven theory. This poll offered a regional/provincial breakdown. Alberta recorded the lowest percentage of respondents who regarded global warming as a fact (70 percent) and the highest percentage of participants who felt global warming to be an unproven theory (20 percent).

A second 2013 poll, a joint effort of Environics and the David Suzuki Foundation, reported virtually identical results on this issue as Environics reported regarding the same question in 2012. Eighty-three percent of respondents said the science was conclusive that the global climate was warming; 13 percent weren't persuaded the science was conclusive.

Forum Research released climate change poll results in July of last year. They asked more than 1,600 Canadians this question: "Do you believe the earth's climate is changing or not?" Eighty-one percent responded affirmatively; 13 percent said they didn't believe the climate is changing. As Angus Reid reported in 2013, the belief in climate change was weakest in Alberta. Alberta's belief percentage was 73; 20 percent of respondents from this province didn't believe the climate is changing.

And the Responsibility for Climate Change Goes To...

Politically, the issue of responsibility for contemporary climate change is key. With responsibility should come expectations of action. If the good Lord is responsible for climate change there's little you, me, or government can do to affect its pace (but adapting to change, whether inspired by divine forces or not, is a different story). But if you are convinced by the scientists who argue that human activities are primarily responsible for climate change, as I am, then we should be considering changing behaviours to slow its pace.

Two of the surveys cited above are used here regarding the responsibility for climate change. They are compared in the accompanying table because the question they posed about the causes of climate change, while not identical, was very similar. Several aspects of a comparison are striking. First, nationally nearly a two-thirds majority (58 percent) now believes human activity is responsible for climate change and this arguably appears to be a substantial increase in a very short period of time. Those who believe natural climate variation is the culprit for change also increased, from 9 to 17 percent. Second, respondents became more certain in assigning primary responsibility over this brief period. The sharp drop in those who believe both human activities and natural climate variation are responsible demonstrates this. Third, both the direction of Albertans' opinions shifts and the magnitude of those shifts are quite similar to those typical of the Canadian sample. Finally, Albertans are significantly less certain than Canadians with respect to assigning responsibility for climate change to human activities.

What Do Alberta's Engineers, Geologists, and Geophysicists Think About Climate Change?

Please don't fall out of your chair when I suggest that livelihood, meaning the importance of oil and gas to the Alberta standard of living, is likely crucial to explaining the reluctance of more Albertans to accept the scientific consensus that human activities are primarily responsible for climate change. If livelihood and the importance of petroleum to the Alberta economy help to explain Albertans' slow warming to the scientific consensus what should we expect

Canadians and Albertans on the Issue of the Causes of Climate Change, 2012 and 2014
(percent)

	Canada			Alberta		
	Human	Natural	Both	Human	Natural	Both
Insightrix (2012)	32	9	54	21	12	62
Forum (2014)	58	17	24	38	25	36

Insightrix 2012: "Where do you stand on the issue of climate change? Occurring due to human activity, natural climate variation, or partially due to both?
Forum 2014: "Do you believe changing climate is a natural phenomenon or is it caused by human activity?"

to see from those whose occupations are especially important to the petroleum sector?

In February 2008 the Association of Professional Engineers, Geologists and Geophysicists of Alberta gave us some initial insight into this question. In late 2007 APEGA distributed a climate change survey to its members. Those results provide an interesting look into what APEGA members felt then about climate change and its causes.

For all intents and purposes 100 percent of the survey's 1,077 respondents agreed with the position that the climate definitely is changing (99.4 percent). No disagreement there.

As in the Insightrix and Forum polls, survey participants were asked to give their opinion on the causes of climate change. Here APEGA members were asked if contemporary climate change was primarily due to natural factors, human factors, or both natural/human factors. The survey reported significant disagreement among APEGA members when it came to identifying the causes of climate change. By far the largest group believed both human and natural factors were responsible for climate change. Forty-five percent (45.2 percent) took this position. Natural factors were the second most popular choice among APEGA's respondents. Twenty-seven percent (27.4 percent) thought factors such as natural variation, volcanoes, sunspots, and lithosphere motions were primarily responsible. Following closely behind at 25.7 percent was that segment of this professional public who lays primary responsibility at the doorstep of human activities.

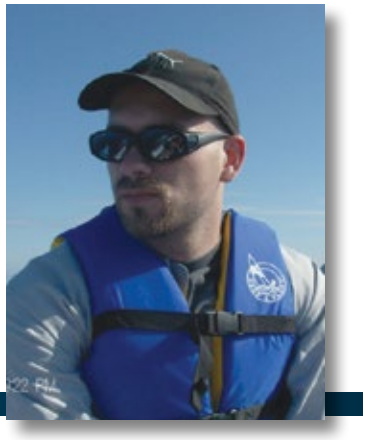
It would be very interesting to note if members of this professional association now have moved, like was suggested above by comparing the Insightrix and Forum polls, out of the "both" camp. If such a movement has occurred where have these professionals gone – into the human responsibility or the nature responsibility corner?

One important conclusion to take away from the APEGA survey is that there was significant diversity and difference of opinion among these professionals about the causes of climate change. The survey data from 2007 cannot be used to support statements such as "APEGA members see natural forces as the primary cause of climate change" or "APEGA members agree with the vast majority of scientists and see human activities as primarily responsible for climate." We know that because the 45 percent of respondents who answered "both" to the responsibility question were never asked to rank the relative importance or weight of human and natural causes. To try to use these data to support either argument grossly misrepresents and misuses the data and the conclusions gathered by good, professional social scientists.

Connie Beattie - Featured Artist

Red Bear on Green, 20" x 15", Acrylic on Illustration Board

A Closer Look at Bow Basin Flood Mitigation Proposals



By David Robinson

The summer floods of 2013 made Calgarians aware of a harsh truth: flood risk levels in the city are high. According to Wolf Keller, engineer and chair of Calgary's Flood Mitigation Expert Management Panel, significant elements of the city's current infrastructure are inadequate for withstanding floods like those seen in 2013. This became apparent when many neighbourhoods, including the downtown core, were evacuated and went without power for days as many buildings in the region were vulnerable to flood waters. Those waters didn't treat kindly the critical heating, ventilation, and electrical systems found in many of their basements. Given that much of Calgary is built on the floodplains of two rivers, what flood protection solutions are being emphasized in the city?

In April 2014, the Government of Alberta announced $625 million in funding towards flood mitigation projects across the province. Of this budget, a whopping $594 million (just over 95 percent of the total funding amount) will go towards engineered solutions such as hardening riverbanks and constructing diversions and dams. Hardening involves lining riverbanks with riprap – boulders, chunks of concrete, and other such hard rubble. Riprap is quick to implement and may reduce site erosion at lower flows, but it has numerous disadvantages. Habitat in armored areas, especially those with an abundance of soft sediment and vegetation, will be destroyed. Bank armoring is also ineffective at containing floodwater and may wash away during high flows. Narrowing river channels this way will result in higher-velocity flows during seasonal floods that actually will increase downstream erosion and reduce the river's capacity to hold higher flows.

West of Calgary the Government of Alberta is exploring reservoir construction to accommodate excess floodwaters when needed. A so-called "Room for the River" diversion is one such structure planned for the Springbank region that will divert water from the Elbow River. This presents complications with private and grazing lands. Landowners and leaseholders will have to expect periodic flooding on their land. Fortunately, Trout Unlimited biologist, Lesley Peterson, suspects this project would do less damage to Elbow River fish habitat than the McLean Creek dry dam. However, he would ultimately prefer to see communities moved from the floodplains rather than turn to water diversion projects. As the article goes to press, it seems most likely that the diversion will be a dry reservoir designed to fill only during periods of extremely high flows. This will likely not disrupt smaller cyclic flooding events, ensuring silt and nutrient recycling continues as normal. Trout Unlimited hopes screening devices or salvaging programs will be in place to ensure fish, including the threatened bull trout native to Elbow waters, are not lost to the reservoir when it fills. The end of 2015 should see the initial review for this project completed. The Prentice government gave the Springbank diversion the green light on September 26, putting it on the fast track for completion.

Another proposed structure is the Glenmore Reservoir Diversion. It would channel excess water from the reservoir through an eastbound tunnel and return it to the Bow south of downtown. The exact tunnel location is still being deliberated, but seems most likely to run under Heritage Drive and terminate in Carburn Park. Considering most of central Calgary's flooding last year was along the Elbow, diverting any excess water this way is expected to significantly reduce the amount of water that breaches riverside homes and downtown streets. The tunnel's feasibility study is still being reviewed.

Potential ecological impacts of the Glenmore Diversion are important to consider, but are likely significantly less than what a full dam structure upstream would entail. Because most of the tunnel structure will be deep underground any impacts to river ecology would be seen at the ends where it breaches the surface. Apart from typical issues associated with surveying and construction (noise and waste, for example) there are concerns the intake and outlet structures may disrupt nearby river microhabitats. Changes to erosion and sedimentation of the banks, water turbidity, and soil quality downstream in the Bow River are risks to be expected when the tunnel releases large volumes

of floodwaters. This could have large impacts on the habitats of fish and other aquatic animals in the Bow River and adjacent parks downstream of the tunnel. The feasibility study promises staging areas will be small and located distant from ecologically sensitive areas along the river. It also proposes, without offering specifics, engineering controls to mitigate impacts of the floodwaters' outflow. In the event of habitat damage, habitat compensation may be offered, although that undertaking would be uncertain, perhaps especially so in light of the recently watered down federal *Fisheries Act*.

Further up the Elbow River there is still a possibility of constructing a 50 metre tall, gated dam near McLean Creek, upstream of the village of Bragg Creek. This complex project would require relocating a large part of a highway and a bridge crossing the Elbow. The McLean Creek dam may hold nearly 50 million cubic metres of water and would reduce the volume of water flowing downstream during 1:100 year or less historic flows. Above 1:100 year levels, it would release the flows once storage is filled. We note that 1:100 flood levels are about 30 percent less than the June 2013 flood storage requirement and that the 20th century historic record may not predict well climate change-affected flow variation.

As with all dams, the potential environmental impacts associated with this project are huge. Inundating the upstream region during a flood will devastate natural vegetation and forest communities. Meanwhile, downstream areas will be affected by disruptions in sediment deposition that may exacerbate riverbank erosion, disrupt natural turbidity levels, and trouble aquatic species. Bull trout, our 'threatened' provincial fish, still occupy this section of the Elbow River. If flows are higher than a 1:200 year level (about 30 percent above the June 2013 flood storage requirement) an earth cut overflow channel would divert waters into the downstream Elbow via Maclean Creek. Significant erosion in the channel area and McLean Creek would occur in this event. This proposal may therefore convey a false sense of security to the downstream acreage owners and hamlet residents. Alternatives should be pursued instead. Vulnerable homes and infrastructure in low-density areas should be moved away from the river; more of the floodplain area should be available again to slow and disperse high waters. The dam is currently in early stages of planning; a three-month environmental review will be completed before any development progresses.

> Fifty-five percent of Albertans believe the severe flooding of 2013 was a symptom of climate change.
>
> - Ipsos Reid/CTV poll, December 2013.

On the Bow River, TransAlta and the Alberta government formed a long-term agreement to modify management of the Ghost Reservoir to increase its flood water holding capacity. While more information on the environmental impacts of this modification should be disclosed, this decision to make better use of existing infrastructure appears to involve minimal new ecological impacts. This seems positive.

Meanwhile, on the Bow River's Highwood tributary further south, the Alberta government recently approved a 'south' diversion project that will connect the Highwood and Little Bow rivers just south of High River. This diversion will have the capacity to handle up to 500 cubic metres of water per second and would significantly lessen the blow another 2013 magnitude flood would deliver to that area. With this diversion come many of the same concerns identified regarding the aforementioned projects, including sedimentation disruption and changes to turbidity levels during flooding. Bull trout have a home in this river system as well.

Such structures are not permanent solutions. Floods greater than the 2013 event occur so infrequently we cannot be certain of the damage they would create. While the proposed structures may be able to withstand floods up to the magnitudes experienced in 2013, the likelihood they would ***eventually*** experience a flood they were not built to withstand should still be considered. What importance should be attached to these possibilities? Additionally, the costs of structural diversions and barriers are not one-time investments. These structures require regular supervision, inspection, and maintenance costs for repairs and upkeep. Once that 95 percent of flood recovery funds are invested in building them, they will require regular additional financing to ensure they remain up to snuff. Riparian and wetland habitats, on the other hand, are largely self-sustaining once established if they can be protected from destructive human activities.

The large amount of money allocated to these hard engineering approaches that may or may not withstand climate change-affected weather patterns leaves a measly $31 million for natural flood recovery management. While this is certainly better than nothing AWA would prefer to see greater emphasis placed on renaturalizing river floodplains in low-density areas. Homes and infrastructure in those areas should be relocated.

About one-third of the 'natural recovery' funding, $10 million, will go to restoring fish habitats damaged by the 2013 flood. The remaining $21 million will go toward a Watershed Resiliency and Restoration Program (WRRP); this will focus on creating and improving

riparian and wetland habitats to enhance watershed functioning. According to a guide released by Alberta Environment and Sustainable Resource Development (ESRD), the WRRP will consist of education, stewardship, restoration, conservation, and scientific research components to bolster the watershed's resilience to flooding and droughts.

ESRD established a multi-disciplinary External Advisory Committee to provide guidance for the WRRP's progress and funding. Among those recruited for the committee are freshwater and wetland conservation societies such as Ducks Unlimited Canada, Trout Unlimited Canada, and the Alberta Riparian Habitat Management Society (more commonly known as Cows and Fish). AWA spoke to representatives of each of these organizations: they are all pleased that, through the WRRP, the Government of Alberta recognizes that riparian and wetland ecosystems are important. They also are pleased that ENGOs and Alberta communities have the opportunity to do something positive with flood recovery funding.

At the time of writing the specifics of the organizations' duties are still being worked out. However, there are a number of things they hope to be involved in. Ducks Unlimited Canada is interested in wetland restoration and would likely focus its efforts on small (approximately one acre or smaller) wetland habitats that were lost to drainage as those provide the greatest productivity for waterfowl. Cows and Fish wishes to work with landowners and other partners to assist with management improvements on riparian lands, including a modest amount of education and awareness about the importance of riparian health. Trout Unlimited intends to apply for the January 2015 round of funding and hopes to be involved in restoring riparian and in-stream fish habitat.

There are opportunities for improvement everywhere along the province's watersheds and adequately funded WRRP projects can facilitate that. According to Norine Ambrose, Executive Director with Cows and Fish, habitat restoration and monitoring may be inexpensive in comparison to large-scale engineering projects, but they require access to land and landowner/land manager participation. Although many landowners are already stewards of the land, additional funding will help them implement changes that might otherwise be cost-prohibitive or hard to accomplish without the technical support they need. Barry Bishop, Alberta Head of Conversation Programs with Ducks Unlimited Canada, agrees that the majority of funding will likely go to securing land access agreements for wetland restoration.

There are still concerns over the program's longevity beyond its current three-year plan. Landowners and policies may change in the future, meaning the security of restored habitats is not set in stone. Additionally, if the WRRP's geographic focus is downriver of Calgary, the city and upstream communities are not likely to see the benefits riparian management offers for flood mitigation.

Dave Mayhood stressed in the June/July 2014 issue of *Wild Lands Advocate* that flooding is a natural and inevitable characteristic of river systems and rivers need room to expand during these times of increased flow. The WRRP guide explicitly says that Alberta was in dire need of a new flood management program to ensure long-term mitigation of future floods and droughts. Then-ESRD Minister Robin Campbell himself stated in an August interview with *Metro News* that healthy watersheds are "our first and arguably best defence against flood and drought." Considering how badly it is needed, the announcement of the WRRP is promising but we wish more of Alberta's flood recovery funds were devoted to the program.

Are construction projects and wetland sinks the only solutions available to mitigate flood damage? Keller mentioned that moving development away from water is sometimes more practical than moving water from development. It would be good to see more serious attention paid to that solution. Moving current infrastructure and focusing the development of new infrastructure to areas outside of the floodplain will give rivers the room they need to expand without the damage and disruption they can cause. Doing so would be very costly, but it would presumably be a one-time cost that would save money in the long-term. This could be a viable option for Bragg Creek and other low-density communities along the watershed. To date, only one entire floodplain community in High River has been required to relocate; a voluntary relocation program has been offered to only 250 other Alberta families to move away from flood-prone areas. Alternatively, in high-density areas where relocation is impractical, increasing the resiliency of existing structures will reduce the magnitude of disruption and repair costs in affected areas. There is $90 million allocated for bolstering current government buildings, including schools and hospitals.

The overwhelming funding preference for building flood mitigation infrastructure gives the impression that watershed ecology is only of symbolic importance to the Alberta government. Ideally, more attention should be placed on developing and maintaining river sinks that will not disrupt natural habitats. They are very good long-term flood mitigation solutions. This is the message AWA continues to deliver to our elected officials.

Focus:

Alberta's Species-at-Risk

By Nigel Douglas

Pikas: Rock Rabbits in a Changing World

There is nothing quite like the unmistakeable "eek!" of a pika calling from a Rocky Mountain scree slope. Anyone who has spent time in the mountains will be familiar with the sound of these squat, tailless relatives of rabbits and hares. Though they can be hard to see, their distinctive yell follows you as you pick your way across the scree, or scramble down a jumble of boulders. It would be as hard to imagine the mountains without their ubiquitous pikas as it would be to picture them without snow.

As with Alberta's mountain goats (*WLA* October 2014), pikas are not officially a "species at risk" in the province, at least not yet. But as another mountain specialist, reliant on high alpine conditions, pikas nevertheless face an extremely uncertain future in a habitat highly susceptible to the vagaries of a changing climate.

Although there are 30 members of the pika family spread throughout the northern hemisphere, in Canada we have just two species. The collared pika is restricted to northern British Columbia, Yukon, and western parts of the Northwest Territories. The more familiar American pika occurs throughout the mountains of Alberta and BC, and down through the mountainous states of the western U.S. Their favoured habitat is scree and rock slopes edged by alpine meadows.

Pikas, affectionately if inaccurately known as ***rock rabbits***, are small, brown, slightly dumpy looking animals with short, rounded ears, short legs, and no visible tail. Though that description may sound slightly unflattering, there is an undeniable charm to pikas. For me it comes from their alert, upright manner and their brazen, chiding call. One of the most striking things about pikas is that, despite living in high altitude habitats throughout the year, they do not hibernate in the winter. Instead, they literally make hay while the sun shines throughout the summer, collecting mouthfuls of grasses and plants, and leaving them out to dry on a nearby warm rock. When the "hay" is sufficiently dry, they remove it to their underground burrows, where it is stored, to be eaten at leisure throughout the cold winter months. Living under the winter snow, they remain relatively insulated from the worst of the cold and the wind raging outside.

PHOTO: © D. VONESCH

In fact, this selection of a high mountain home is more than a lifestyle choice for pikas; so well are they adapted to their cold homes that they can rapidly overheat if temperatures warm. They may die from overheating if exposed to temperatures of as low as 78 degrees Fahrenheit for just a few hours. To some extent, they can respond to warmer temperatures by moving to higher altitudes but eventually, of course, they simply run out of mountain.

Pikas in Alberta are listed as ***secure***. In fact they are officially "non-licence animals" which means they can be hunted or trapped throughout the year without a licence (why anybody in their right mind would want to hunt a pika is unclear). But with a dramatically changing climate, it is hard to see that this security will persist for long. Climate change is now an undeniable scientific fact. According to the US Environmental Protection Agency the average temperature in the

U.S. could increase by between 4 and 11 degrees Fahrenheit by 2100, depending on emissions scenarios and climate models. Even the Alberta government recognizes that "our planet is warming at a rate unprecedented in our recorded history," but there are no current plans to re-evaluate the status of pikas or that of other species likely to be affected by climate change.

While some more mobile species such as birds or butterflies can respond to a changing climate by expanding their range north over time, pikas are more restricted to pockets of mountain habitat which are not necessarily connected. Therefore, their populations are likely to become smaller and smaller, and more and more isolated, until eventually they will wink out. The significance of the need to protect interconnected landscapes across an enormous range becomes apparent when we look at pikas. The inspiring vision of the Yellowstone to Yukon initiative, for example, is one that would allow animals such as pikas the maximum opportunity to react to warming climatic conditions by gradually moving northwards and upwards. In a changing world, pikas are going to need all of the help they can get.

Quick Facts:

- **American pika, *Ochotona princeps***
- **Federal status: No status**
- **Provincial status: Secure**
- **Weight: about from 120 to 170g (4 to 6 oz)**
- **Length: 162 to 216 mm (6–8 in)**
- **Surprising fact: Pikas cannot tolerate high temperatures; they may die from overheating when exposed to temperatures of as low as 78 degrees Fahrenheit for just a few hours.**

Vagrant shrew

One of Alberta's rarest residents, the vagrant shrew, is also one of its tiniest. About the weight of a quarter, vagrant shrews grow up to 10 centimetres (4 inches) long, though a third of this is made up of the tail. In Alberta they are restricted to the very far southwestern corner of the province, in the western Castle and Waterton Lakes National Park.

Vagrant shrews are typically shrew-shaped, with pointed snout and the sharp teeth of a carnivore. They are red brown with paler underparts, though they are usually darker in the winter. They have a long tail often two-toned, with a paler underside. This is especially the case in juveniles. It can be difficult to tell apart from other montane shrews, though it is generally smaller, with a shorter tail. Scientists with a good eye and a hand lens will tell you that it is distinguished by the number of friction pads on the hind feet, and the fine details of its skull.

Like most shrews, they are largely carnivorous, eating worms, spiders, insects, and other small invertebrates, though they also eat some plant material including fungi, roots, and seeds. Shrews generally have a very high metabolic rate, and vagrant shrews are no exception; they can eat more than 160 percent of their own body weight in food every day. They can be active during the day or night and tend to be highly active in short bursts of as little as ten minutes, interspersed with periods of rest.

Photo of a vagrant shrew from the Ridgefield National Wildlife Refuge located just north of Vancouver, Washington. PHOTO: © L. TOPINKA

Their main predators are owls and mammals such as coyotes and bobcats.

The shrew family is one of the most widely distributed mammal families with several hundred species worldwide. In Canada, the vagrant shrew is found only in southern British Columbia (including Vancouver Island), and as far east as the extreme southwest of Alberta. Their range extends south into the U.S. through the Rocky Mountain states as far south as California.

Generally, their habitat is wet grassland and meadows. In Alberta there are very few confirmed records of vagrant shrews at all; they seem to prefer the wetter coniferous forest of the Lower Subalpine Subregion, though they are also present in the Foothills Parkland and Upper Subalpine Subregions. They seem to prefer wet conditions and, though they don't dig tunnels, they favour the cover provided by thick mats of vegetation and dead wood.

The Alberta government lists the status of vagrant shrews as "May be at Risk" and notes on its website that they are "extremely rare," with population size "unknown but estimated at fewer than 100 breeding individuals." Although the suggestion that it is "(k)nown from only seven verified records in West Castle area" may be slightly out of date, the warning that "(t)imber harvest, petroleum exploration, and recreational development threaten the population" is unfortunately all too current. The vagrant shrew is another in a long line of wildlife in the Castle threatened by poorly-managed resource extraction and motorized recreation. What the management implications are for a species right at the edge of its range are not clear and there are still considerable gaps in what we know about its habitat requirements. But we hope that the creation of a new 54,588-hectare Wildland Provincial Park in the Castle, proposed in the new South Saskatchewan Regional Plan, may go some of the way towards redressing the balance.

Quick Facts:

- Vagrant shrew, *Sorex vagrans*
- Federal status: No status
- Provincial status: May be at Risk
- Weight: 4 to 8 grams (0.14 to 0.28 oz)
- Length: 10 cm (3.9 in) in total, including a 4 cm (1.6 in) tail
- Surprising fact: The vagrant shrew is one of the few land mammals which can use echolocation (in a similar way to bats) to orient themselves.

Conservation Corner:

When Winter Changes

By Niki Wilson

This February or March, somewhere in the deep snow of the Rocky Mountains and Foothills, wolverine mothers will build snow caves in which to birth their young. The dens will provide protection from predators, and insulation from the cold until the young are hearty enough to weather the dangers of the world outside.

Deep and persistent snow is key ¬– research suggests wolverines prefer a snowpack of over a metre that lasts well into the spring. And it is this dependence on late winter and spring snowpack that makes them vulnerable to changes in climate – changes that could diminish snowpack through earlier spring rains and warmer temperatures.

Wolverines are one of many species whose behaviour is driven by winter. As climate change modifies winter conditions, invariably wolverine and many other species will feel an effect. But understanding exactly how a species will react is complicated, says Dr. Brent Sinclair, an associate professor in the Department of Biology at the University of Western Ontario.

"There's a strong tendency to frame climate change in black and white, and it's not," says Sinclair, who adds that in order to mitigate the possible effects of climate change, scientists must identify which species will benefit, and which will be vulnerable. Given the range of species' physiological and behavioural responses to winter, and the variation in how climate change will affect specific regions, it's a complicated business.

As complex as it is, in a paper soon to be released, Sinclair and colleagues Caroline Williams and Hugh Henry present a general framework for predicting the impact of winter climate change on terrestrial organisms. In the paper they review what is known about the effects of winter climate change on species across the globe.

They say species will be impacted from changes to winter temperatures, the variability of winter conditions, and changes to winter snow cover – but not all in the same way. There are many possible outcomes.

For example, it is well known that cold winter temperatures limit the activity of mountain pine beetle, says Sinclair. In this case, the relationship is relatively straight forward, and warmer temperatures will likely allow the beetles to advance. But in other cases, it's more complex.

For some areas, climate change models predict smaller snow packs and less snow cover. They also predict a greater frequency of freeze-thaw cycles throughout the winter. This combination may be problematic for amphibians like the wood frog, which use an incredible amount of energy to prepare their bodies to freeze solid each winter. Sinclair says a deep and consistent snow pack helps insulate them from changing temperatures, allowing them to maintain their frozen state. Thawing and re-freezing several times over the course of a winter will quickly drain their energy reserves. "A decrease in the amount of snow will potentially restrict their distribution," says Sinclair.

Erynnis propertius by S. Rae is licensed under CC BY 2.0
www.flickr.com/photos/35142635@N05/7437712788/in/photolist-ckfdTo-ckfdkw-oeun9k-JbF4a-JbzMA

Warmer temperatures in the fall and early winter season may also prove detrimental to species like the Propertius Duskywing *(Erynnis propertius)*, listed as a species at risk in B.C. The butterfly completes its life-cycle in a year. Says Sinclair, "Once it has finished feeding in the fall, the energy that it takes into winter is all the energy it has to survive, and then to turn into a butterfly at the end of it." Caterpillars exposed to warmer falls and winters are more active, and they use more energy than they should. In the end, says Sinclair, this means the butterfly that emerges in the spring will be smaller, if they survive at all. "These butterflies will have fewer offspring, which means the population declines."

Conversely, some animals may benefit from warmer winters. For example, the black-capped chickadee is a species that spends up to 30 percent of its body weight every night just to stay warm. Like many small birds, surviving the winter is a delicate balancing act of eating and resting. Though recent studies suggest chickadees are well adapted to survive short-term extreme cold and bad weather events, they cannot survive if prevented from feeding for more than a day. Warmer temperatures may mean less energy is required to stay alive in the winter months. However, some types of extreme weather events, like ice storms, can encase their food in ice and starve them. An increased frequency of this type of event would leave the chickadees more vulnerable.

Sinclair says climate change is creating some worrying mismatches between some species and the emergence of their spring food source. He explains that in general, a major cue that causes birds to migrate is change in length of day - birds tend to fly north at roughly the same time every year. But the insects they feed on when they arrive develop in response to temperature, not daylight. When springs are warmer earlier on, caterpillars and other larvae develop earlier. "When the birds arrive and start looking around for these insects to feed their babies, the caterpillars have already grown up and gone away."

As Sinclair says, winter is important – from the initiation of hibernation, to the fattening of the body to resist cold, to the maintenance of snow pack and its power to insulate. With so many northern species adapted and dependent on a range of winter conditions, continuing to understand which species are vulnerable, and how they may be affected, is key to any possibility of mitigation.

Niki Wilson is a multi-media science communicator and biologist living in Jasper. Visit her at www.nikiwilson.com.

Connie Beattie - Featured Artist

Wings of Hope, 16" x 20", Acrylic on Canvas

Wild West Gala

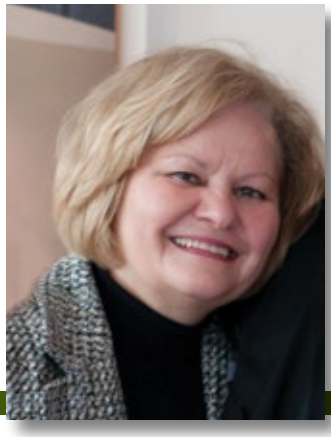
Photograph: © K. MILHALCHEON

As the lights dimmed, the doors opened, the music began and our faithful and new friends and guests began arriving, there was a sense of wow – what a great event was about to unfold. The pictures here speak for themselves and for the fun time we all had.

Our sponsors and supporters made all the difference as we came to celebrate Wild Alberta. Young and old alike enjoyed conversation, great food, excellent wine, and tremendous fun bidding on silent and live auction items. This was the 26th year we have organized our fall gala – a time when we stop, take a deep breath, and invite our friends and colleagues to join us in some serious celebrations. And there's so much to celebrate – our vast and rich natural resources, our wildlife and wild landscapes and the people we work with every day to ensure governments, companies, and other organizations make good decisions.

Thanks to everyone who helped make the evening a great success and we hope to see you again next year!

The Great Gray Owl Award



By Christyann Olson, *AWA Executive Director*

Heather Crone

AWA's top volunteer award is the Great Gray Owl Award that is presented to an outstanding individual in recognition of characteristics, not unlike the great gray owl. With unending patience and dedication to purpose, these individuals work wisely and tenaciously to conserve wilderness habitat and wild creatures. Our success is a reflection of the enduring commitment they have made to AWA.

Heather Crone is this year's Great Gray Owl – she embodies a high standard of volunteerism, dedication and commitment. Heather describes herself as a Saskatchewan farm girl. She called AWA her family when she accepted her award at our Annual Awards and Lecture evening on October 31, 2014. Knowing and appreciating your family and helping when you can is both natural and very important to her.

We describe Heather as "vivacious, tough, caring" and so those words are engraved on the plaque recognizing her and our other award winners. Shy of the spotlight and always ready to help – that's Heather. Sometimes I think she literally reads your mind. Just think that something needs to be done and… when you turn around – presto – Heather's already working on it! No muss, no fuss, just "I'm here to volunteer, what can I do?" Whether it's her gorgeous, reassuring smile or the fact that she always seems to have the tool we need for this or that job Heather epitomizes what the volunteer spirit really means. We are so pleased to honour her with our top volunteer award!

In Memoriam Robin White – A True Conservation Champion

It is with the deepest regret that the Alberta Wilderness Association acknowledges the passing of Robin White on December 7, 2014. Robin was well known throughout Alberta for his extensive personal and professional commitment to the cause of conservation.

For many years Robin was head of new-community planning at the City of Calgary. His team used new-urbanism planning principles to produce communities where housing choice and public transport are increased, shopping for most basic needs is within walking distance for many residents, and car dependency and car dominance of the streetscape are reduced. For this work, his team won an award for planning excellence from the Canadian Institute of Planners.

Robin and Marian, his spouse and partner in life, were a very special team passionately committed to the well being of the environment. This culminated in the publication of their award-winning book *Wild Alberta at the Crossroads*, which is a stunning compilation of their superb photography coupled with a powerful call to action by all Albertans to protect our natural heritage.

Robin will be deeply missed by so many. The Board and Staff of the Alberta Wilderness Association extend their deepest condolences to Marian on her profound loss and the loss of such a true friend of nature.

Updates

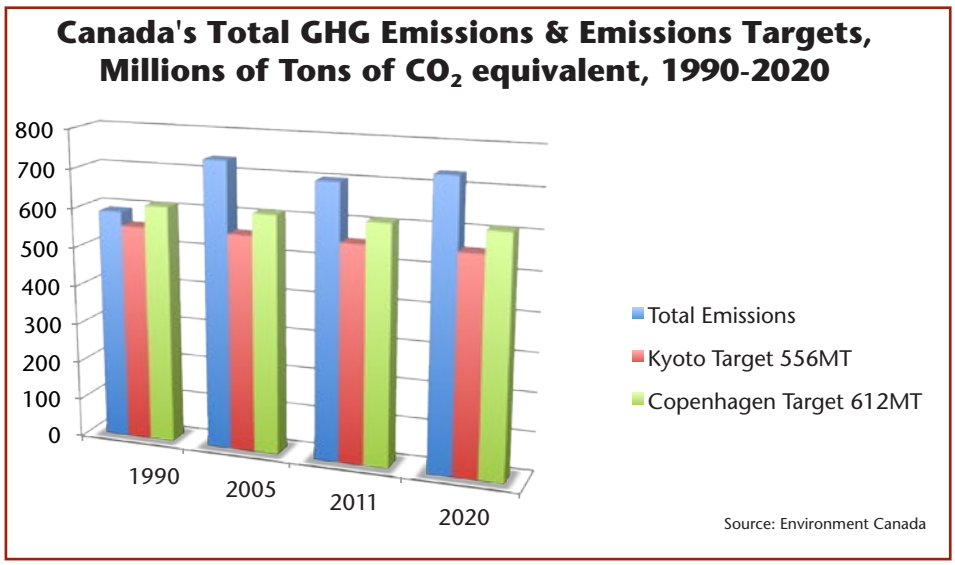
Mitigating Climate Change: How's Ottawa Doing?

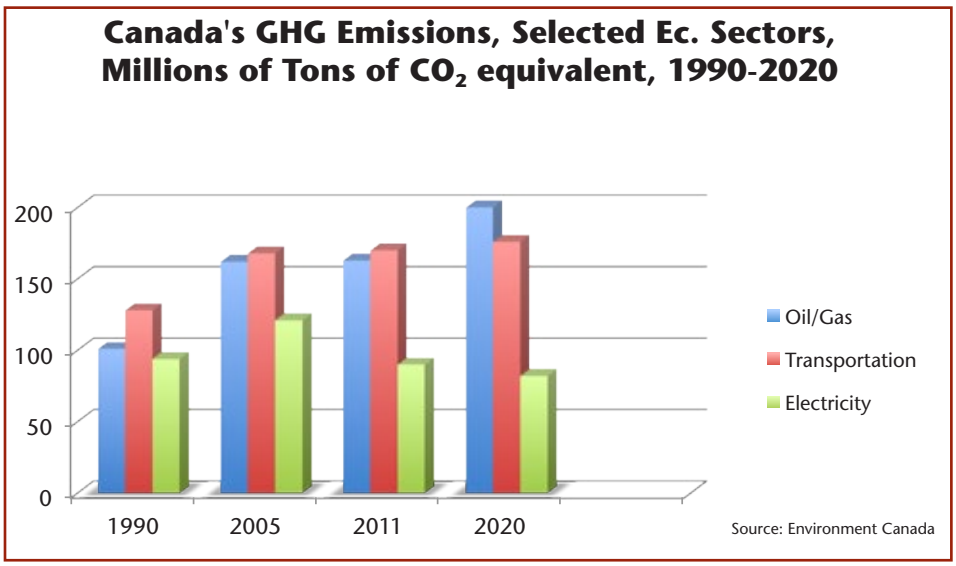
Loss of glaciers, changes to the water supplies and levels in the Prairies and the Great Lakes-St. Lawrence regions, increased risks from coastal storms, more frequent heat waves – Canada's Commissioner of the Environment and Sustainable Development identifies these as some of the effects climate change has on Canada today.

Commissioner Julie Gelfand presented her Fall 2014 audit of Ottawa's environmental and sustainable development performance in October. The audit focused, in part, on mitigating climate change.

Her climate change audit had three objectives. First, the audit focused on four aspects of Ottawa's policy performance since 2012. They were whether Ottawa had put in place emission reduction measures, had assessed their success, had developed emission reduction mechanisms with provincial and territorial governments, and had an implementation plan regarding the contribution of federal agencies to meeting Canada's emissions reduction goal.

Second, the audit asked whether Environment Canada had a sound methodology for measuring and reporting our future greenhouse gas emissions. Finally, when Ottawa signed the Copenhagen climate change accord in 2009, it committed Canada to devote $1.2 billion to assist developing countries to adapt to climate change. The Commissioner's staff examined whether the funds had been disbursed and to what effect.





This update considers the first focus of the Fall 2014 audit. The Commissioner took this focus because of deficiencies she discovered in her 2012 examination of how much progress Canada had made to meet the emission reduction target for 2020 the federal government pledged to honour at the Copenhagen climate change conference in 2009. That target was to reduce GHG emissions to 17 percent below what they were in 2005. If Canada meets its Copenhagen obligations our GHG emissions in 2020 will be 612 megatonnes.

If such a reduction sounds impressive remember this target is actually less ambitious than the commitment Canada made when it ratified the 1997 Kyoto Protocol. Our Kyoto commitment was to reduce emissions to six percent below 1990 levels by the 2008-2012 period, to 556 megatonnes. Canada's GHG emissions in 2012 were 699 megatonnes.

Looking back at the 2012 audit the Commissioner wasn't optimistic the federal government had developed a regulatory approach capable of eliminating the 88 megatonne gap between 2012 emissions and our 2020 target. This past October the Commissioner seemed more pessimistic. She concluded "the evidence is stronger that the growth in emissions will not be reversed in time and that the target will be missed."

Delay is a word often encountered in the Mitigating Climate Change chapter. The greater the importance of a sector to the economy, the more likely you are to see delay associated with the development of GHG reduction emissions. For exam-

ple, regulations for the oil and gas, emission-intensive trade-exposed, and natural gas-fired electricity sectors remain at the conceptual stage, the same stage they were at in the spring of 2012. Discussions and consultations remain the order of the day in these sectors. The prospect mentioned in the Commissioner's 2012 report – that we would see proposed regulations by the end of 2012 – hasn't materialized. Tellingly, the 2014 report doesn't even speculate when those proposed regulations might be forthcoming.

One of the only bright spots was transportation where progress is the word used to characterize regulating the transportation sector. Here Canada essentially has followed the lead of the U.S. Given the high level of integration in the North American market our regulations tend to mimic American regulations.

If, with respect to developing a regulatory approach, Canada seems to be exhibiting the speed of a tortoise rather than the industriousness of a beaver how are we doing when it comes to monitoring policy effectiveness? When we put a regulation in place are we measuring its impact well?

No. The federal government only can report on the results of the measures it's taken regarding passenger vehicles and renewable fuels. But even here it can't estimate yet the actual GHG emissions reductions from the regulations. Our government is blind when it comes to seeing the effects of its actions.

For a generation now Liberal and Conservative governments have talked about reducing Canada's GHG emissions. One might have hoped that, as our ambitions shrank, the chances of meeting our international GHG reduction commitments would have increased. They haven't – that would seem to be the Commissioner's message.

- Ian Urquhart

Just plain short – the greater short-horned lizard proposed recovery strategy

Today, your job is to imagine a desirable outcome, one that can't happen without government action. Now imagine government took more than 82 years (human life expectancy in Canada) from today just to develop a vague plan to pursue your preferred outcome. Then imagine the government said, after unveiling its vague plan, it would take another 60 years or so to develop an action plan to start to pursue your dream. The chances you will live to see that policy are zero, no better than the odds of the Edmonton Oilers making the playoffs.

Welcome to the world of the short-horned lizard, Alberta's only native lizard (see the article on the short-horned lizard by Nigel Douglas in the April 2014 issue of *WLA*). In April 2007 the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) recommended placing this tiny lizard on the Endangered list because it is "facing imminent extirpation or extinction."

More than seven years later, well beyond the average lifespan of these reptiles, the federal government released its proposed recovery strategy for this endangered species. Ottawa proposes to complete an action plan to recover these lizards…but not until 2018. Few current members of this endangered species will live to see what actions government will take to promote the survival of their species; none of the short-horned lizards that existed in southeast Alberta when they were designated as endangered are alive today to see the proposed recovery strategy government has conjured on their behalf.

In AWA's comments to the federal Minister of Environment about the Harper administration's proposed recovery strategy we pointed out it offered no concrete actions to recover the species. Anyone familiar with the plight of endangered species in Canada knows the key to brighter futures for species at risk may be summarized in one word – habitat. Actions to protect and restore critical lizard habitat in Alberta's Dry Mixedgrass Subregion must be taken. It's really just that simple.

Instead so-called actions in the proposed federal strategy focus primarily on "monitoring and assessment," "research," and "communication." Such measures won't protect one acre of critical habitat for this species.

At a minimum the strategy must protect all remaining habitat and prohibit all new road construction in critical habitat. This must happen now, not in 2018.

Such action would be a sign of a serious intent to focus clearly and unambiguously on the threats succinctly outlined in COSEWIC's 2007 assessment summary. Then COSEWIC said the reason for designating the lizard as endangered were "ongoing oil and gas development, proliferation of roads, proposed mineral development, and an increasing human presence."

AWA hopes the Minister will heed our comments and significantly revise her proposed recovery strategy. We need a final strategy with the courage to address seriously the industrial activities that have clearly endangered the future of this species. We will continue to follow the science of COSEWIC and push the federal government to follow the spirit and letter of the *Species at Risk Act* with respect to the greater short-horned lizard and other endangered species.

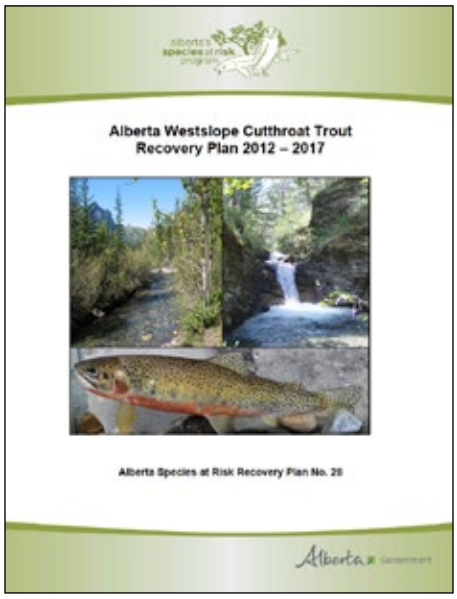
- Ian Urquhart

The Upper Star Creek Valley – Tarnished by Logging

Readers of *Wild Lands Advocate* are all too familiar with the sad ironies AWA's work brings to light. Two images here introduce you to another example – logging in the upper reaches of Star Creek valley.

One image is the cover of the province's five-year recovery plan for westslope cutthroat trout. The top-right photo on that cover is of Star Creek. Star Creek, along with Girardi Creek – a tributary of Star Creek, were identified as critical habitat for westslope cutthroat trout in the federal government's 2014 *Recovery Strategy for the Westslope Cutthroat Trout* (Oncorhynchus clarkia lewisi), *Alberta Populations in Canada*.

The second image was taken in December 2014. The photo looks down a steep embankment from the edge of a Canfor haul road, a road built to facilitate logging in the Star Creek valley. Through the trees, rough-



Cover of Westslope recovery plan.
CREDIT: GOVERNMENT OF ALBERTA

ly 20 metres from the road's edge, you can make out critical cutthroat habitat in the shape of Girardi Creek.

The irony? The government-approved road – a road that lacks any sediment fencing or erosion control – poses a real threat to the critical habitat it showcases on the cover of its recovery plan.

The government has some serious explaining to do. First, building this road so close to Girardi Creek contradicts the government's own standards and guidelines for operating beside streams. This road is nowhere near 100 metres from Girardi Creek's high water mark (the required minimum distance from Class 'A' waterbodies). Even if the province claimed Girardi Creek is a Class 'B' waterbody, hard to sustain since the creek is critical habitat, this road still violates provincial standards. A road should not be permitted within 60 metres of Girardi Creek.

Second, what AWA witnessed in its visit to the upper Star Creek valley appears to contradict clearly what we were told by a senior forester with Alberta Environment and Sustainable Resource Development. In late September AWA was told that provincial regulations "have been adhered to in all aspects related to watershed protection." The proximity of the haul road to the Girardi Creek doesn't satisfy the province's regulations.

That letter from ESRD further inferred that, if anything, the province was going beyond regulatory requirements to protect westslope cutthroat trout. The inference is found in this statement: "However, in some locations watersource protection buffers have been exceeded, providing greater protection to aquatic and riparian values and habitats."

Finally, ESRD claims that the planning for the Southern Rockies Watershed Project (the project connected to this haul road) "incorporated" the federal recovery strategy released in 2014. That strategy stresses the importance of preserving critical habitat in that recovery strategy and lists sedimentation from road construction as one of the threats to cutthroat critical habitat in Alberta. It's tempting then to conclude that incorporating the federal strategy is not synonymous with following the federal strategy.

In mid-December AWA raised these and other concerns regarding logging and haul roads in the upper Star Creek valley with the Hon. Kyle Fawcett, the Minister of ESRD. We look forward to his early response to our concerns and will report back to you when we hear from the Minister. We hope this is a sad irony we, and Alberta's native westslope cutthroat trout population, won't have to live with for long.

- Ian Urquhart

A breach in the Star Creek haul road's meager berm allows muddy water to flow down into Girardi Creek, about 20 metres distant. PHOTO: © D. MCINTYRE

Reader's Corner

Naomi Klein, This Changes Everything – Capitalism vs. The Climate

(Knopf Canada, 2014)

Reviewed by Heinz Unger

Does this really change everything? This is the question I asked myself after almost 500 pages full of climate history, heroes and villains, hard evidence, and moving stories. Her introduction suggests we are doomed; her conclusion offers a faint, but unlikely to materialize, glimmer of hope.

Her discussion of Brad Werner's research holds the key to her title and message. In 2012 Werner made a presentation at a meeting of geophysicists titled "Is Earth F**ked?" His advanced computer model answered this question with "More or less." But one dynamic in his model, described as "resistance," could slow down an economic machine careening out of control. Werner defined resistance as "movements of people or groups of people" who "adopt a certain set of dynamics that does not fit within the capitalist culture" and which includes "environmental action, resistance taken from outside the dominant culture, as in protests, blockades and sabotage [as] by Indigenous peoples, workers, anarchists and other activist groups."

From Werner's modeling Klein concludes that only a powerful social and economic change movement of unprecedented scale and reach can halt our planet's slide towards "ecocide." This indeed would change everything: from the current deregulated capitalism to a decentralized system based on strong communities and much greater economic equality. This sounds to me like a new version of social democracy, without ever calling it such. The author then refers to historical instances when popular movements led to profound social and economic changes – such as the abolition of slavery and the civil rights movement.

Her almost utopian society and economic system sounds tempting but I'm not convinced we would really cut our consumption habits so drastically and start a rebellion. Klein offers recent "effervescences of rebellion" like Occupy Wall Street and Idle No More to support her expectations. I'm unconvinced they will become the foundations for a much broader movement. Nor do I think that the political and corporate establishments are likely to change their "extractivist" resource use driven by their unrelenting insistence on never-ending economic growth. Climate scientists consider the recently announced agreement between the US and China to deal with the growth of their respective CO_2 emissions – epochal as it may be – to be too little and too late to halt the slide towards irreversible changes in our climate. This "major breakthrough" will not keep global temperature increases below 2 degrees celsius; but it may be the foundation for more ambitious agreements in the future – unless it is too late by then.

The alternative to system change would be a brutal crash of the current economic system brought about by unprecedented disasters like floods, droughts, fire, and mass extinctions. In such situations, the most vulnerable low income and disadvantaged people would suffer the most. In this context it is surprising to learn from Klein that if we only went back to the lifestyle and consumption and population levels of the 1970s (remember the first energy crisis in 1973?), CO_2 emissions would become manageable. But we are ignoring safe emission limits and waiting for technology, philanthropic billionaires, the market, or even God to save us. Our provincial government certainly will not save us. Environment minister Kyle Fawcett – not a climate change denier, who called taking action "a moral and economic imperative" – just announced a municipal energy efficiency program with funding of $2 million, for all of Alberta – a pittance! We may indeed need God or Naomi Klein's revolution to save us.

She has been called "the most visible and influential figure on the American left," and *This Changes Everything* is Naomi Klein at her very best. Klein first battled globalization and the big brand corporations in *No Logo*. Then she set her sights on capitalism and free market policies (*Shock Doctrine: The Rise of Disaster Capitalism*). In 2009 she turned her attention to the environment and climate. Much of her facts, figures and examples of good practice are juxtaposed with powerful evidence of governments' and corporations' unwillingness to forgo the big profits resulting from fossil fuel extraction. It is not surprising that Klein blames this reluctance to change on the dominant capitalist system and the compliant voters and consumers that we are. And it may be more than just a little convenient for Klein's political convictions to see the capitalist system primarily blamed for the climate dilemma we are in. Here we should remember that China's centralized and authoritarian economic system has been making an equal or worse mess of the environment.

Klein's book is a fascinating read, and the 50-page list of sources and references, plus the 30-page index, make it an essential history and handbook for the serious climate activist. But what in this book is of interest to AWA?

We know already that climate change will increasingly affect wildlife habitat and migration patterns, and extractive resource industries will grab more of the remaining wild spaces. Klein tells her readers in some detail how "Big Green" organizations – her name for the large US-based ENGOs, have been cooperating with the big fossil fuel companies on emissions reduction programs such as carbon markets, emissions trading or off-

sets, and other economic instruments. These ENGOs accepted large donations from the oil and gas industry, but in total, these initiatives achieved relatively small gains.

Klein likely would not have approved of AWA's acceptance last year of a substantial donation from Shell Canada. In fact, she asserts that some environmental groups have been so hungry for donations that they naively heaped praise on every corporate half-measure. They haven't realized that the market-based climate solutions favoured by many green organizations have provided invaluable benefits to the fossil fuel sector. Klein calls this "the failure of the polite strategy." As an example, Big Green supported burning more natural gas to help lower carbon emissions, but this led to more fracking with all its awful impacts. There is not just the appearance of a potential conflict of interest but a real risk of being polite rather than honest and critical if a big donor is involved.

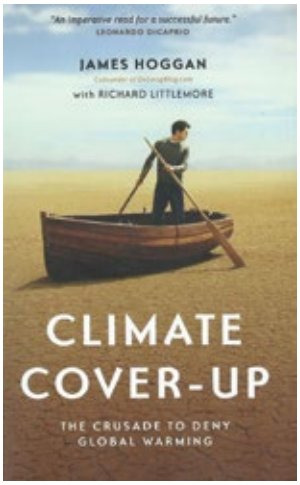
We may really need, in Klein's words, "a powerful mass movement to end the climate crisis to protect humanity from the ravages of both a savagely unjust economic system and a destabilized climate system."

Can this change everything?

Heinz Unger, a past president of AWA, splits his time between working for local ENGOs and The World Bank (on poverty alleviation projects).

James Hoggan (with Richard Littlemore), Climate Cover-Up: The Crusade to Deny Global Warming, (Vancouver: Greystone Books, 2009)

Reviewed by Nigel Douglas



Welcome to a "story of betrayal, a story of selfishness, greed, and irresponsibility on an epic scale." It is worth making a couple of points clear before discussing James Hoggan's startling book *Climate Cover Up*.

Climate change, caused by human activity is a scientific fact beyond any reasonable doubt. The U.N. Intergovernmental Panel on Climate Change made it clear in its Fifth Assessment Report in 2013 that: climate warming is unnequivocal, greenhouse gas levels are at levels not seen in 800,000 years, and human influence is the dominant cause of warming since 1951.

Even the Alberta government concedes this in its so-called Climate Change Strategy (2008).

Hoggan's book does not deal directly with the scientific uncertainty around climate change because there isn't really any. Instead it deals with the complex and murky world of climate change denial, with its "experts" and "scientists" who are well paid, "not for conducting climate research but for practicing public relations."

Hoggan is the co-founder of DeSmogBlog.com which declares itself the "world's number one source for accurate, fact based information regarding global warming misinformation campaigns." He owns a public relations firm in Vancouver, so he should recognize public relations spin when he sees it.

So what do you do if you are an industry that stands to lose profits if measures are introduced to deal with the human activities which are leading directly to a changing climate? You spin the message. You combat scientific evidence with well-funded opinion, spend huge amounts of money on "think tanks" which essentially carry out no research, and question scientific evidence. You essentially offer no peer-reviewed scientific evidence of your own and you sow seeds of doubt in the media and in the public mind wherever you go.

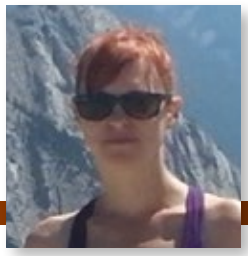
The book begins with Dr. Naome Oreskes' exhaustive review of peer-reviewed scientific journal articles on climage change. Her *Science* article looked at whether the 928 articles studied supported, contradicted or were neutral on the growing scientific consensus that human releases of greenhouse gases were causing climate change. Not one article opposed the consensus position. In contrast, coverage in the four "prestige" dailies in the U.S. suggested there was real division in the scientific community. There wasn't.

Hoggan describes a well-funded, concerted effort, going back to the 1980s, to muddy the waters about climate change. The chemical and petrochemical industries funded the establishment of so-called "grassroots" groups. They paid scientists, not to carry out research or to question existing studies, but instead to work "to change the conventional wisdom, irrespective of science." The mainstream media reported this ruse uncritically and therefore helped to misinform the public. They bear responsibility for the fact that a significant slice of the public doesn't believe climate change is pressing.

In Alberta, where the oil and gas industry is king, the message of the deniers has fallen on fertile ground. Hoggan takes aim at the Canadian organization, Friends of Science, described by Charles Montgomery in the *Globe and Mail* as "a coalition of oil-patch geologists, Tory (Canadian Conservative Party) insiders, anonymous donors and oil-industry PR professionals" from Calgary. Montgomery detailed how the Friends were reluctant to take money directly from energy companies, but instead received funding through the Science Education Fund set up by the University of Calgary political science professor Barry Cooper. Donors to the fund remained anonymous. Hoggan refers to a UofC audit that found that professor Cooper, in Hoggan's words, "had sluiced hundreds of thousands of dollars through his 'educational' accounts without meeting any of the university's standards for such actions." The University of Calgary's auditors concluded the bulk of the funds had been used for purposes that "were not legitimate scientific research and education and were funded by anonymous donors to promote special interests."

This is an important book. Hoggan develops a powerful argument that our ability to address climate change depends, in part, on our ability to "restore integrity to the public conversation about science, about governance, and about saving the world."

Gear Ideas - 'Warm Hands, Same Heart'



By Kristina Vyskocil

The Celstron Elements FireCel

Winter activities… a pick up game of shinnie at the local outdoor rink, stargazing out at Elk Island National Park, or a frosty morning walk in the River Valley with the pup. 'Tis the season, day or night, to look for ways to keep warm, well-lit, and wirelessly connected. Tuck the Celestron Elements FireCel into the pocket of your parka or toss it into your glove compartment for when you need it most to keep your hands warm.

What is the Celestron Elements FireCel?

The Celestron Elements FireCel is a three-in-one device for when you're on the go: part hand-warmer, part flashlight, and part portable powerpack means this tool will warm your hands, light your way home, and power your gadgets – all at the same time ($44.75; USB cable, micro USB adapter, carrying strap and drawstring carry pouch included).

What does the Celestron Elements FireCel do well?

The Celestron Elements FireCel does well by its name: it's a compact aluminum heating element designed to keep your hands as warm as possible: it is ergonomically shaped to fit perfectly in the palm of your hand (148 g; 4.5 x 9.5 x 2.3cm; 3.5 x 2.5 x 1"). The dual temperature warmer emits scent-free heat to keep your hands warm for approximately three hours when set to low (maximum 43°C; 110°F), and approximately two hours when set to high (maximum 54°C; 130°F). The FireCel functions for approximately 30-35 hours solely as a flashlight with five modes between the bright red and white LED lights: red light only, white light only, blinking red light, blinking white light, and an SOS distress signal for emergencies. Status LEDs also indicate the FireCel's powerpack levels: three green lights indicate the device is fully functioning, while four red lights tell you it needs to be recharged. In three hours, the lithium polymer battery (2500mAh) fully recharges the FireCel. You can quickly recharge the battery so the FireCel is ready for when you need to recharge your electronic devices. When the FireCel is charged fully you should be able to run your MP3 player for approximately thirty minutes, your cellphone for two hours, and your smartphone for three hours.

What are some drawbacks of the Celestron Elements FireCel?

Power transfer times for iPads and other USB-charged devices are currently unknown. As well, the FireCel claims it is able to recharge most, but not all, smartphones.

What's the bottom line?

The FireCel gives just the right amount of portable heat and light while maintaining connectivity to keep you doing what you do into those long and cold winter nights. Reusable and compact, the Celestron Elements FireCel is an essential tool that helps you not only survive these Alberta winters but thrive outdoors under its great big sky, year after year.

Kristina currently works at Mountain Equipment Co-op and is in the final year of her Honours English degree at MacEwan University.

Connie Beattie - Featured Artist

A Mother's love 2 , 15" x 20", Watercolor on Illustration Board

On the Fence, 13.5" x 21.5", Mixed Media on Wood

Winter Events

Wilderness Around the World Speaker Series

Sponsored by the Wildbird General Store and Jackson Power in support of Alberta Wilderness Association

Thursday, January 22, 2015 – Namibia with *Lu Carbyn*

Thursday, February 12, 2015 – Bhutan with *Geoff Holroyd*

March 2015 (Date TBA) – Speaker and *Topic TBA*

Thursday, April 30, 2015 – Ethiopia with *Clint Docken*

Thursday, May 28, 2015 – Iceland with *Vivian Pharis*

Location (for all talks in series): Jackson Power Electric Ltd. (9744 - 60 Avenue, Edmonton)

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

Tickets: Donations at the door

"Grasslands" Documentary Film Screening with Director Ian Toews

Tuesday, January 20, 2015

This documentary examines the unique natural habitat of the mixed-grass prairie through four seasons from the perspectives of the ranchers, conservationists, and aboriginal people who understand it best and live by preserving it. Film Director Ian Toews will introduce the film and answer questions at the end of the show. Popcorn and other movie snacks will be provided!

Location: 455 – 12 Street NW, Calgary
Time: Doors open at 6:30p.m. Event begins at 7:00pm
Tickets: $20.00

Edmonton Munch and Mingle

Friday, January 30, 2015

An informal evening to get together with old friends and meet new ones, a chance to find out what AWA is busy working on, and what's ahead in the coming year. Board members and staff will provide a short update on our programs and initiatives.

Location: Wild Earth Bakery and Cafe (14238 - 85 Avenue NW, Edmonton)
Time: 7pm -9pm
Tickets: FREE (donations accepted at the door)

Snowshoe Hike with leader Ed Hergott

Saturday, February 28, 2015

Join Ed Hergott on a snowshoeing hike in Kananaskis Country to get some fresh air, exercise and enjoy the winter wilderness!

Location: Read's Ridge
Difficulty: 3 out of 5 (Moderate)
Elevation Gain: 650m
Distance: 4 km return
Estimated duration of hike: 4 to 5 hours
Cost: $20.00 members/$25.00 non-members
(*more details will be sent out to registrants a week prior to the hike)

Music for the Wild

Saturday, February 7, 2015

Headline Act - Charlie Ewing & Bob Blair

Charlie Ewing will be joined by his friend Bob Blair, playing pedal steel guitar and dobro. They will be playing Charlie's songs from his two exceptional CD's of songs about cowboys, Indians and wide open spaces, some of Bob's songs and a few from 'lesser known' songwriters like Ian Tyson and Tom Russell. Charlie and Bob are great story tellers in song and prose, exceptional players and fine entertainers.

Opening Act - Blue Rambler

Blue Rambler is made up of good friends (Don Gowan, Murray Little and George Campbell) who like old music. They play blues, old country, swing and newer styles that harken back to a simpler time. They like to have people join in singing, swinging and listening to the stories in their favorite songs.

Location: 455 – 12 Street NW, Calgary
Time: Doors open at 7:00 p.m. Music at 7:30pm
Tickets: $20.00

Music for the Wild

Saturday, March 14, 2015

Headline Act - Magnolia Buckskin

When four singer/songwriters join forces, the outcome is **Magnolia Buckskin** – an acoustic quartet of sublime vocal harmonies and refreshing original songs that will inspire you! The four are Kathy Cook on mandolin and guitar, Natasha Platt on accordion and guitar, Emily Triggs on bass and guitar and Corry Ulan on banjo and bass; they bring you a blend of grassroots, folk and pop music.

Opening Act - Donna Turk

Donna Turk has been playing fiddle since she was nine years old. She has flourished in fiddle competitions, toured and played around the world, and is a passionate fiddle teacher. Her first CD, About Tyme, was released in June in 2012, and features her original compositions and traditional fiddle tunes.

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 or 1-866-313-0713
*****Pre-registration is required for snowshoeing trip and highly recommended for all other events.**

CLIMB & RUN FOR WILDERNESS

24th Annual

April 18th, 2015

Celebrate Earth Day at the Calgary Tower

Climb 802 stairs or Race 1km and Climb 802 stairs

ALBERTA WILDERNESS ASSOCIATION
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