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AWA



A WILD LANDS ADVOCATE

THE ALBERTA WILDERNESS ASSOCIATION JOURNAL



Rumsey, Parkland Natural Region PHOTO: C. WALLIS

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COVER PHOTO

Aspen parkland once stretched over 255,000 km² of the prairie provinces. In Alberta, the Central Parkland Natural Subregion sweeps in a wide arc from Airdrie to north of Edmonton, and east to Lloydminster and Provost. Today, the Rumsey Natural Area and Ecological Reserve (together, the Rumsey Block) are surrounded by a checkerboard of cropland. In fact, Rumsey is the only large, relatively undisturbed area of aspen groveland on hummocky disintegration moraine left in world. It represents a landscape that is almost extinct and provides a valuable ecological benchmark.

FEATURED ARTIST

Bigoudi is the *nom de plume* of Canmore-based artist Pascale Ouellet, who chose Alberta as her home six years ago. She studied fine arts in Montreal and is now a full-time painter. Although she is not a landscape painter, the Rocky Mountains and the wild areas around her home contribute to her creativity by enlightening every day of her life. Her medium of choice is encaustic, which is the process of painting with wax. For more information about the artist and her upcoming solo exhibition on September 20, please visit www.bigoudi.ca.

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PHOTO: C. WEARMOUTH

TOO BLESSED TO BE STRESSED

The arrival of a “lifestyle” magazine in AWA’s mailbox a few weeks ago, with promises of “affordable luxury homes” (a fascinating oxymoron), contained multiple ironies. The thick glossy pages are filled with opportunities to invest in “vacation and investment properties” in the most pristine of environments. A double-page spread features Canmore’s Silvertip golf resort, with the Three Sisters towering in the background. Even if it were within the financial reach of AWA staff, we’d have a hard time justifying owning vacation property in a development we fought to prevent. Gleniffer Lake, a popular resort southwest of Innisfail, is described as containing “crystal-clear glacier water.” Perhaps this went to press before the lake was contaminated in June by an oil pipeline break that spilled 20,000 litres of crude into the Red Deer River, which feeds into the lake.

The photos of stunning natural vistas are captioned with references to “Mother Nature’s finest locations,” the “soothing properties of water,” and the “many natural wonders” of the featured resorts, without a hint that those wonders will decrease in proportion to the increase in development. The Lake Newell area, south of Brooks, is exalted as an ideal venue for water skiing and wakeboarding, and for enjoying its three bird sanctuaries, all in the same breath. Moving to more exotic locales, a large photo features the Arizona desert in golden evening light, with subtle shades of desert rocks and flora backgrounding manicured, startlingly green turf – “desert golf at its finest,” says the caption. No mention of the vast amounts of water needed to paint this arid landscape green in an area with annual precipitation of seven inches.

The final irony – the magazine ends with an article about making green, sustainable living “the new normal.” The author recommends driving a hybrid car, buying carbon credits when flying, and avoiding bottled water – all valid suggestions, but they will do little to help conserve wilderness, keep our water clean and plentiful, and boost dwindling wildlife populations if we continue to feed our hunger for owning wild places.

The stones I’m throwing here are aimed at my own fantasy glass (or rather, strawbale) house in the wilderness. The desire to “own the Rockies,” as a current website address exhorts, is sometimes overwhelming, especially as the city I live in continues to grow. But I also believe that Margaret Atwood has a point when she writes that the moment I say “I own this / is the same moment when the trees unloose / their soft arms from around you, / and the birds take back their language, / the cliffs fissure and collapse...”

Here in Alberta – although the “boom stress” is reflected in increased poverty, homelessness, and road rage – many of us are too blessed to be stressed about the future. As our coffers overflow, our long-term vision atrophies. We tend to forget – or maybe we never knew – that everything we do impacts non-human nature, either directly or indirectly. This issue of the *Advocate* reminds us of those impacts – from the decrease in biodiversity because of species we have introduced into the province to the taming of a wild river by damming it up, from the destruction of wilderness by high-impact recreation to the loss of grizzly bears because of our government’s refusal to address the real cause of their demise.

Alberta may someday be listed among the many civilizations whose “success” led to their demise because of a refusal to live within the cycles and limits of non-human nature. Let’s hope we wake up in time to avoid being the subject of Jared Diamond’s *Collapse II*.

– Joyce Hildebrand, Editor



BIODIVERSITY OR HOMOGENIZATION – IT'S OUR CHOICE

By Joyce Hildebrand, AWA Conservation Specialist

Attributing human qualities to the creeping bellflower taking over my inner-city lot comes naturally: it's tempting to think of it as an aggressive, tenacious, manipulative, sneaky, exploitive bully. After years of digging, sweating, and swearing at this once-desireable perennial, invited to North America from Eurasia to adorn our flowerbeds, I've changed the goal from eradication to mitigation.

This plant, of course, is only doing what comes naturally to all living species – propagating. But in a new, heavily disturbed area, the constraints that kept it from overwhelming other species in its native habitat are gone, and it has quickly spread. Although we might say it has “gone wild,” it has actually done just the opposite.

The creeping bellflower is by no means the most problematic of introduced species – its provincial designation is a mild-sounding “nuisance.” It has not yet found its way into Alberta's wilderness areas, but it may be only a matter of time. Many species across Alberta, Canada, and the world are finding themselves in similar situations and are being labeled “invasive species.”

Albertans' concern with harmful introduced species has a long history; the most widely known example is perhaps our much-touted rat-control program, still active 60 years after its beginnings. And although the mountain pine beetle (a native species, unlike the maligned rodent) has achieved considerable notoriety in the last year or two, our awareness and concern may not include the devastating effects of plants such as Russian olive and leafy spurge, or introduced grasses like smooth brome or crested wheatgrass.

Scientists, however, have long known otherwise. The IUCN (World Conservation Union) has identified the problem of what many scientists call “non-native invasive species” as one of its major global initiatives, describing

the impacts as “immense, insidious, and usually irreversible” (2000). Johanne G  linas, Canada's Commissioner of the Environment and Sustainable Development, brought attention to the problem in a 2003 speech. “Experts long ago concluded that invasive species are second only to habitat destruction as a cause of biodiversity loss,” she said. “All Canadians should be concerned.” Five years later, in March 2008, the Office of the Auditor General of Canada reported that “aquatic invasive species are entering Canadian waters faster than Fisheries and Oceans Canada is able to assess the risks they pose to Canada's environment and economy.”

The Linguistic Maze

Terminology is a hot topic in invasion biology (see sidebar). In common usage,

the word *weed* describes a plant growing where it's not wanted – too subjective a term to be very useful for our discussion here. If you're an insect, the Canada thistle is exactly what you want on your dinner plate – the pollen is abundant, the nectar delicious. If you prefer natural remedies to pharmaceuticals, the thistle is your friend – you can chew on the root for pain relief. But if you're a farmer or a conservationist, you won't argue with Alberta's “noxious weed” classification of this hardy, prolific Eurasian transplant.

The term *invasive species* has a more objective definition, but it's still a little like pinning down the meaning of the word *love* – it depends on context and history. While sweet clover might be a valuable nitrogen-fixing cover crop to an agriculturalist, to a conservationist concerned with preserving the

Language Matters

Since words accrue connotations like a rock gathering barnacles, language is seldom neutral. Nor is there much truth in the “sticks and stones” proverb. A close look at language is time well spent.

As invasion biology developed over the last 50 years, a split developed in the vocabulary used in this field. Some ecologists preferred more value-free terms such as *introduced species*, *new species*, *new residents*, and *geographic spread*. Others tended toward terms with higher emotional content: *exotics*, *aliens*, *invasives*, *non-natives*. The invasive biology literature is often filled with militaristic terms as well: *battle*, *weapons*, *war*, *line of defence*, *invasion*. In the last decade, some scientists began expressing concern about compromising credibility by using the more emotive terms. Since many introduced species do not have a negative impact on ecological integrity, even the logic of dividing species into native and non-native has been questioned. Some have suggested that ecologists refer to species that cause ecological harm as “harmful new species” rather than “invasive aliens.”

Alberta writer and naturalist John Acorn, in his book *Ladybugs of Alberta*, notes that invasion biologists have been accused of “a tendency toward racism (in the form of ‘nativism’ – a prejudice against non-native species), xenophobia (the fear of things that are new or unfamiliar), nationalism, and stabilism (the belief that things should forever stay the way the Creator, or the ‘balance of nature’ intended them).” Some have even invoked aesthetics, encouraging the association of native species with beauty, and non-natives with ugliness.

All human activity impacts the rest of nature, the effects ranging from positive to negative, from minimal to disastrous. If we are concerned about minimizing our ecological footprint while enhancing quality of life for all species, including humans, we must both act and speak with awareness and consideration for the well-being of both human and non-human nature.



“Buffalo Roam” 80x28 inches, encaustic ©BIGOUDI

biodiversity of a rare ecosystem, it is likely to be considered invasive.

The IUCN defines *invasive species* as “organisms (usually transported by humans) which successfully establish themselves in, and then overcome, otherwise intact, pre-existing native ecosystems.” The U.S. Department of Agriculture takes a more human-centred approach: an invasive species is a species “whose introduction does or is likely to cause economic or environmental harm or harm to human health.” Although the term *invasive species* is often used interchangeably with *non-native species*, an invasive species can be either native or non-native to the area it colonizes.

Scientists generally agree that a native species is one that occurs naturally (that is, without human introduction, either intentional or not) in a particular ecosystem or defined region. Species native to North America, then, are those that evolved here and occurred on the continent prior to European settlement. Any other species is *non-native*, a term used interchangeably with *alien* or *exotic*.

Whether the native/non-native distinction is even helpful is a subject of scientific debate – how a non-native species impacts ecological integrity depends on many factors, including the specific characteristics of the ecosystem into which it has been introduced. “Native/non-native” does not necessarily equate with “good/bad.” The critical underlying issue, from a conservation perspective, is one of human activity and its impact on ecosystems and habitat.

Alberta Wilderness Association (AWA), and conservation groups in general, tend to see invasive species through the lens of ecological integrity, a phrase for which long technical

definitions abound. Notwithstanding the complexity of the concept, ecological integrity can be summed up by “the three Ps” – persisting parts and processes. Persisting: enduring over time and in a given place. Parts: a variety of different species, or biodiversity. Processes: interactions of the parts with each other and with the surrounding soil, water, and air. Invasive species can affect all three Ps, thus weakening and eventually destroying ecological integrity.*

Although introducing a non-native species sounds like an increase to the biodiversity of an ecosystem, it can in fact disrupt ecological functions and cause displacement or extirpation of native species. The area’s biodiversity may actually decrease, sometimes dramatically, and it’s short-sighted to see this as a matter impacting only non-human nature. According to University of Manitoba’s Rob Roughley, “Invasive species have the potential to disrupt the ecological services that humans depend on for our own survival” (“Detecting Invasive Species,” 2004).

**Thanks to Peter Achuff, Cyndi Smith, Lorne Fitch, and Cheryl Bradley for the three Ps.*

The Invasion Triangle

Three things must be present for a species to become invasive: a propagule, a dispersal agent, and a susceptible habitat.

A propagule can be a seed, an entire organism, an egg, a root – any means by which a species can propagate – but all propagules are not created equal. Some species, for example, are more tolerant of a range of environmental conditions than others. Some are less detectable, more easily transported. And some have shorter

life cycles with an associated increased likelihood of establishment. Asexual species don’t need a partner to propagate, a good survival quality when a propagule finds itself alone in a new world.

Nature, of course, is never static. The propagule of a non-native species can be introduced via natural means – birds inadvertently carry larvae or eggs on their feathers or feet from one place to another, or deposit seeds through feces. Wind and water carry seeds and organisms into new territory. Temporary land bridges allow animals and plants to migrate, and climate change can cause extirpation or extend the range of a species.

Natural dispersal, however, generally takes place at a snail’s pace (sometimes literally) and has been thwarted for millennia by geographical barriers and inhospitable habitats. In the last few centuries, one species has breached those barriers, dragging other species along with it. Humans have modified habitats and accelerated dispersal to comparative lightning speed through industrialization, increasingly free trade, and thriving global tourism, increasing both the speed and the range of species dispersal.

Often our introduction of species into wilderness areas is unintentional. Seeds are carried on hiking boots and the wheels of off-highway vehicles or bicycles, in pant cuffs, pockets, and luggage – and are deposited unwittingly far from their native habitats. Ships collect ballast water in one ocean and discharge it in another, releasing thousands of organisms into foreign territory. Hitchhiker species accumulate on ships’ hulls and travel the water courses of the world.

But intentional human introduction of species is more common than one might



Disturbances such as this wellsite in Rumsey Natural Area are a clear invitation to the invasion of non-native species. PHOTO: J. HILDEBRAND

think. Most Canadian crops and garden species, for example, are non-native and have been intentionally introduced for economic or aesthetic reasons. Ladybugs and other insects are brought in for biological control of so-called pests, worms for waste management and bait, and animal species for food, pets, and recreational hunting and fishing. Wild boars, for example, were brought from Europe to Alberta game ranches in the early 1990s and some escaped. Since they produce 12 or 13 young per litter twice a year, they rapidly proliferated; in May 2008, the government officially listed the wild boar as a provincial pest, giving anyone the right to do away with them. Some domestic pigs have escaped from farms in Alberta and are adapting to the wild, even changing their physical appearance and growing tusks.

A propagule and a dispersal agent without a susceptible habitat will generally not result in invasion. An introduced non-native species will be unlikely to take root in a healthy, natural ecosystem with high biodiversity, where native species and natural processes are functioning in a strongly connected food web. The introduced species simply won't find an ecological niche.

Characteristics that increase a habitat's vulnerability to invasion include disturbance, low biodiversity, an absence of potential predators, and high climatic similarity to the invader's home habitat. Few would argue with the claim that human disturbance of habitat in Alberta

has been severe. With human-caused climate change now a global concern, habitats everywhere are changing, with many becoming more hospitable to potentially invasive species. The *New York Times* recently reported on a study showing that higher concentrations of atmospheric carbon dioxide can increase the growth of "weedy plants," increase the amount of pollen produced, and make the plants more resistant to herbicides (June 29, 2008). This, together with habitat disturbance, creates a very uneven playing field for the province's – and the planet's – native species.

The Economics

As noted by Dan Longboat of Trent University, "Economic impact is generally calculated as an impact on vested interests, on things that people have bought and own, or on the annual profits made by businesses" ("Invasive Species from an Indigenous Perspective," 2004). Without full-cost accounting, estimates of the economic cost of non-native invasive species are grossly conservative and vary widely.

Canada's Commissioner of the Environment and Sustainable Development estimates the annual cost of pests affecting crops at \$7.5 billion. In the U.S., the total cost due to the impacts of non-native species is estimated at more than \$137 billion a year. Many indirect costs are not included in those sums, including the loss of wilderness and of ecological goods and services

upon which we are all dependent for life. When a wilderness area is degraded because of the introduction of new species, we all suffer an economic loss, even though it may be spread over generations and across an entire society. And some things cannot be given an economic value – what price can we put on clean air, potable water, and vast, undisturbed wilderness areas, all of which are threatened by the increasing homogenization of the planet's ecosystems?

The Alberta Scenario

On July 7, 2008, Alberta Agriculture and Rural Development issued a "Weed Alert for Saltcedar," urging Albertans not to plant this aggressive invasive species, now being sold in garden centres throughout the province as Pink Cascade. Saltcedar, also known as tamarisk, escaped cultivation in the U.S and is destroying many of the country's natural areas. It forms dense, thirsty stands: one plant can use 750 litres of water per day, lowering groundwater levels, drying up springs and marshes, and replacing native willows, cottonwoods, and other riparian vegetation. The secretion of salt from mature plants forms crusts and inhibits the growth of other plants. Cutting or applying chemicals to control saltcedar simply encourages new growth. As with all problematic introduced species, proactive prevention is the most effective management option (see pp. 14 and 18 for more on saltcedar).

Russian olive is miles ahead of saltcedar in Alberta. The relief of tree-loving European homesteaders must have been palpable when these trees were introduced to the North American Great Plains from Europe in the late 1800s. Windrows and hedges of Russian olive broke the relentless wind sweeping over endless vistas. But for grassland ecosystems, especially for prairie river valleys, it was bad news.

In 1950 Russian olive was introduced in one site on the Milk River floodplain in Montana, 10 miles south of the Canada-U.S. border. Fifty years later, research showed that the plant had moved upriver into Alberta (Cheryl M. Pearce & Derald G. Smith, 2001). Russian olives now outnumber the native cottonwood trees on many sites in the Milk River floodplain. Without intervention, this non-native species will be locally

dominant on the Milk River floodplain in Alberta by 2010. By the end of this century, it may completely displace the cottonwood.

One would think that in the high cold mountain sites that it prefers, the whitebark pine would be safe from invasive species. Clinging to the rocky, poor soils and exposed to onslaughts of wind and snow, this subalpine species promotes biodiversity by being a critical food source for a number of other species, including red squirrels, black and grizzly bears, and Clark's nutcrackers.

But white pine blister rust, a species of rust fungus, was inadvertently introduced to Vancouver in 1910. Today it is found in almost every part of the whitebark pine's range in North America, including the Castle area of Alberta, with the highest infection rates being in the northwestern U.S. and southwestern Canada (see *WLA* December 2007 and p. 15). Without the rapid implementation of effective management strategies, the whitebark pine could soon be on Canada's endangered species list. Because it is a keystone subalpine species, other species are likely to go down with it.

Although few Albertans would find the common earthworm beautiful, most would probably agree with the statement "Earthworms are good for the earth." But

they would be wrong, if we're talking about earthworms in Alberta's wild spaces. Almost all of North America's native earthworms were extirpated during the last glaciation 10,000 years ago, so the earthworms on the continent today are largely introduced species from Europe, colonization stowaways on ships and in the roots of fruit trees. Some species have been intentionally introduced for waste management, soil improvement, or fishing bait.

Although they may do a grand job of composting the soil in your garden, current research from the University of Alberta shows that the non-native earthworms in Alberta's boreal forest decrease the leaf litter layer, change the soil composition by mixing soil layers, and negatively impact forest species, thus decreasing biodiversity. Other studies show that in as little as four years, non-native earthworms pushed some native forest plants to the point of endangerment by changing the forest's soil conditions.

A decade ago, studies of southwestern Alberta's lodgepole pine forests showed that earthworms change subterranean insect communities. And since 80 percent of the carbon stored in Canada's forests is in the duff layer (the soil layer comprising partially and fully decomposed organic matter), where many earthworms spend their lives, scientists

believe that earthworms are making a serious contribution to climate change by releasing this carbon into the atmosphere. The major dispersal agent continues to be humans: anglers abandoning their bait; vehicles, whose tire treads pick up cocoons and transport them; and boat transport along waterways.

Other Alberta examples of new species impacting provincial ecosystems abound. Introduced non-native fish in the Banff Cave and Basin hot springs have been cited as contributing to the extinction of the native species Banff longnose dace. Escaped agronomic plant species such as smooth brome, Kentucky bluegrass, timothy, crested wheatgrass, and white clover pose a serious threat to grassland ecosystems (see p. 12).

Management Options

Management options exist to address each corner of the invasion triangle – propagule, dispersal agent, and susceptible habitat. To be effective, all of these options require appropriate government policy and legislation with enforcement capacity, education and awareness initiatives, research and monitoring, and international cooperation.

Preventing the introduction of potentially harmful new species is, of course, the most proactive and cost-effective option. Prevention includes a diverse suite of tools, including identifying and blocking pathways by which harmful species are introduced, voluntary codes of conduct, and comprehensive risk-based screening processes for intentional introductions.

Not all introductions can be avoided, but early detection and rapid response can prevent new species from becoming invasive and is much more cost-effective than long-term control. Important information about incipient harmful species can be gleaned from observant amateur naturalists as well as trained scientists. Systems of detection and response must be designed and coordinated among the various levels of government. Detection and rapid response may include following a protocol for prioritizing harmful species control projects, limiting spread through eradication and suppression, and expanding information-sharing opportunities.



Many concerned Albertans are depending on the final Land-Use Framework document and its implementation to slow down landscape disturbance, now at an all-time high in the province. PHOTO: N. DOUGLAS



“Variations on the same leaf” 80x28 inches, acrylic ©BIGOUDI

Once non-native species are well-established, the only management option is often control of further spread and mitigation of impacts. Control methods may include cultural practices (crop rotation, hunting, fishing), removal (hand pulling, mechanical harvesting, burning, using herbicides and pesticides), interference with reproduction (sterilization), or biological control. Most scientists, however, will admit that we have barely scratched the surface in our knowledge of how ecosystems work, never mind the details about how each individual species functions. Based on such limited understanding, the best-laid plans for control can go badly awry.

Since the dispersal agent is generally *Homo sapiens*, human behaviour must

change in order to minimize the spread of harmful species. The wide range of options includes seed cleaning, using certified seed mixes and weed-free hay, cleaning topsoil and fill, controlling ballast water intake and deposit, and enforcing invasive species legislation and policy.

Harmful species are much more likely to take hold in a disturbed habitat than in a healthy, biodiverse ecosystem, and habitat disturbance generally occurs because of human activity – in Alberta, often forestry and petroleum exploration and development. To say that Alberta’s landscape has been seriously disturbed is an understatement. In addition to roads, clearcuts, cropland, urban development, and other surface disturbances, the

province has 392,000 km of energy-related pipelines and 21,000 km of transmission lines (2007); 1.4 million km of seismic lines in the Green Zone alone (1995); 227,000 non-abandoned wells, 817 gas plants, 4,726 compressor stations, and 12,243 gas batteries (2006); and 130 km² of oil sands tailings ponds (2008). (All data are from Government of Alberta records.)

The obvious solution to the problem of disturbing habitats, which then provide a haven for introduced species, is appropriate management of high-impact human activities. This includes legislation that requires industry to implement best management practices; slowing the pace of industrial development, particularly in the oil sands; eliminating industrial activities in all protected areas (including Rumsey, where invasive species have become well established – see p. 12); restoring disturbed areas to native species; establishing ecological integrity as the primary goal in protected areas management; and setting aside more large wilderness areas for protection from habitat disturbance.

Not all non-natives are invasive. Some are invasive in some ecosystems but not in others. And some native species can take over and destroy the ecological integrity of their ecosystems. Humans are, of course, one species among many, but our linguistic and tool-using abilities mean that we have considerable control over our actions. We can minimize our impact on the earth if we choose to, or we can create conditions for the continued homogenization of the planet – ultimately to the detriment of most species, including our own. It’s up to us. 🍌



The Milk River Valley of southern Alberta is vulnerable to invasion by saltcedar (*tamarisk*), an aggressively invasive shrub that is considered a serious threat in the southwestern U.S. and has already reached northern Montana. PHOTO: C. WALLIS



EXOTIC FISHES IN ALBERTA – PAYING THE PRICE

By Dave Mayhood

Nelson and Paetz's *The Fishes of Alberta* lists 59 species of fishes with self-perpetuating populations in Alberta. Of these, 51 are native and only eight (golden trout, brown trout, brook trout, northern Dolly Varden, western mosquitofish, sailfin molly, threespine stickleback, and African jewelfish) were introduced into Alberta from elsewhere. Most of the non-native species are restricted to a very few waterbodies – often only one. Only two (brook trout and brown trout) could be considered at all widespread. Despite many, many introductions of non-native fishes documented by Nelson and Paetz, most have failed to become established.

There would therefore appear to be little problem with exotic fish in Alberta: only two exotic species, representing just 3.4 percent of the entire fauna are widespread. But this view ignores several critical issues. In fact, some of the least widespread exotics probably helped to drive one of our unique native fishes to extinction. An iconic native trout of our southern Eastern Slopes is close to being extirpated by introduced genetically distinct forms (stocks) of the same fish and by a closely related species, even though both are native to other Alberta waters. And the two widespread exotic species are slowly replacing populations of certain of our native fishes wherever they encounter them.

All of these problems are exacerbated – and even made possible – by ongoing, relentless habitat modification and destruction. Let's look at some examples.

McCardell's Little Fish: Victim No. 1

"Come and see the little fish swimming in this stream!"

With these few words, recalled some half-century after the event, W. McCardell announced the discovery in 1883 of one of Alberta's most remarkable native fishes. Railworkers McCardell, his brother Tom, and their partner, Frank McCabe, believing they had discovered a



Examining external markings helps to identify the elusive genetically pure westslope cutthroat trout population. This fish may be from a pure or lightly introgressed population. PHOTO: D. MAYHOOD

new hot sulphur spring and cave near the present town of Banff, were exploring the environs of their find when they stumbled upon perhaps our most unusual native fish.

Regrettably, the discovery of the population of McCardell's little fish and its unique hot spring habitat led to the first and only extinction so far recorded in a Canadian national park. Ironically, Banff National Park – Canada's first – had been established for the express purpose of protecting these springs.

Described to science for the first time in 1892 and recognized as a distinct subspecies in 1916, the Banff longnose dace (*Rhinichthys cataractae smithi*) was a unique subspecies of a much more widespread and common native Alberta minnow. It was known from only a single population, occupying the very warm water of the outlet pool of the Cave and Basin Hot spring in Banff National Park. It probably evolved there in place after the retreat of the Wisconsin ice about 10,000 years ago.

By 1988 this little fish was declared "virtually extinct." It had been hybridized into oblivion, introgressed (invasively mixed) by the genes of the widespread and much more common eastern longnose dace, which is native in the

nearby Bow River.

The details of how the extinction came to be are most instructive for understanding threats to Alberta native fishes today. As researchers Claud Reynaud and Don McAllister outline in a 1988 paper, the complete process probably involved a complex witches' brew of habitat destruction, pollution, and exotic species introductions, which are massive and ongoing in the province today.

First, the hot springs habitat of McCardell's little fish was fundamentally changed with human-made structures, repeated water diversions, and flow interruptions. Various chemicals, from DDT to chlorine, were added to the spring waters at various times. And at least 10 exotic species, most of them tropical forms from the aquarium trade, were introduced into the springs, creating non-native populations of thousands of potential competitors, aggressors, predators, and disease vectors. Indeed the most successful of these newcomers, the western mosquitofish, has often been implicated as a cause of native fish extinctions elsewhere.

All of these factors likely had some role to play in weakening or reducing the size of the native dace population.

It appears that critically low numbers caused by some combination of these factors made native dace much more susceptible to hybridizing with the local coolwater subspecies in the Bow River when flow and channel changes brought the two fishes into contact. In the end, it appears that McCardell's little fish – its population weakened by habitat damage and loss, and perhaps by disease, competition, aggression, or predation of invading exotic species – finally succumbed to assimilation by genetic introgression with a much more abundant invader in a highly disrupted habitat.

The Eastern Hordes

Our two most widespread and persistent exotic fishes were brought here, early on, from the east.

Brook trout (really a charr, like our native bull trout and lake trout), probably from Ontario, were introduced to Alberta waters with the coming of the Canadian Pacific Railway in the 1880s. Our earliest record dates from the 1887 report of a fisheries commissioner, a Mr. Whitcher, on the fishes of the Banff area. Mr. Whitcher described many of the fish he saw and made it clear that brook trout were common in the vicinity of Banff by that time. Today, brook trout may be found in almost every Eastern Slopes and Rocky Mountain watershed that is conceivably capable of holding them, including many lakes.

Brook trout, native to western Eurasia, are commonly said to have arrived in Alberta with their release from an upset hatchery truck at Carrot Creek, just west of the present Banff National Park gates, in 1925. Be that as it may, it is clear that there have been many other introductions into the Bow drainage, as well as into the Athabasca, North Saskatchewan, Red Deer, and Oldman drainages. Substantial populations now exist in the Oldman, Crowsnest, Bow, Red Deer, and North Saskatchewan rivers, and many of their major tributaries.

What have been the consequences? Well, on the positive side, Alberta anglers can now catch two additional fine species of trout. Brook trout are extraordinarily colourful fish, are prolific, often spawn successfully in lakes with minimal or no surface outflow or inflow, and are easy to catch. Brown trout can sustain considerable angling pressure (good!),



The blue-ribbon section of the Bow River below Calgary (at Carseland). Now dominated by large non-native rainbow and brown trout, this reach once held some of the largest native bull trout and westslope cutthroat trout in the province.

PHOTO: D. MAYHOOD

largely because they are highly selective feeders and are usually difficult to catch (perhaps not so good, but certain anglers value the challenge highly). Even better – they can attain remarkably large sizes, in part due to their ability to avoid hooks.

These good attributes, which were among the reasons for introducing these fishes, come at a high price. Both brook and brown trout have largely replaced our native trout species in many waters, and their predominance is spreading in some watersheds.

For example, provincial fishery biologist Jim Stelfox has documented the rapid recent expansion of brook trout into Quirk Creek at the expense of native westslope cutthroat trout and bull trout. And in the Clearwater River (North Saskatchewan River drainage), brown trout have invaded all the way to the extreme headwaters deep within Banff National Park. As a result, they have destroyed that river's worth as a benchmark aquatic ecosystem despite its remote wilderness location within a national park. Whether brown trout have displaced bull trout, the only native trout, in the headwaters is not clear, but it is an obvious possibility that must be checked.

The fortunes of both of these introduced species in invading Alberta may have been helped along by often intense habitat modifications in most watersheds. In the Quirk Creek case,

for example, the period of invasion and expansion by brook trout populations seems to coincide with a period of profound channel damage as a result of oil and gas development activities, especially road development and all-terrain vehicle use. Brown trout have (along with introduced rainbow trout) completely replaced native westslope cutthroat trout and bull trout in the Crowsnest and Bow rivers, two of the most highly modified rivers in southern Alberta. In the Red Deer and Clearwater drainages, habitat modification and outright damage is also widespread, and may have aided the spread of non-native brook trout and brown trout. However, the spread of both exotics may have been aided by the absence of native black-spotted trouts, which in large numbers might have provided some limiting competition for them.

Invaders in Our Midst

Arguably the most interesting – and certainly the most insidious and intractable – problem of exotic fish introductions in this province arises from introductions of non-native stocks of species that are native to Alberta, into waters inhabited by native stocks of those same or related species. For example, non-native stocks of cutthroat trout commonly have been introduced on top of native westslope cutthroat trout. Or

even more commonly, non-native stocks of rainbow trout have repeatedly, and in massive numbers, been introduced on top of native westslope cutthroat trout populations. (Don't let the "westslope" part of the name fool you. Westslope cutthroat trout is the subspecies native to Alberta in the Bow and Oldman drainages, even though these waters are on the Eastern Slopes of the Rockies.)

Let's look at the problem of rainbow trout introductions first. Rainbow trout are native in Alberta only to a small part of the upper Athabasca River basin. These populations are genetically distinct to a considerable degree from all other rainbow trout and are not used for introductions. Rainbows everywhere else in the province are introduced, almost always from highly modified hatchery stocks derived from Pacific-drainage populations. These are exotics in every sense of the word, even though the rainbow trout *as a species* is native to a small part of the province.

Rainbow trout introduction into native westslope cutthroat trout waters was often very destructive. The two species hybridized. Commonly they hybridized so thoroughly that the gene pool of the cutthroat population became completely introgressed by rainbow trout genes. In essence a new, different, species was created, bearing the genes of both parental populations. Consequently,

the native cutthroat population became locally extinct.

In nature, rainbows and cutthroats generally do not hybridize when they occur together, as they do in many areas in the Pacific drainage. But when the two fish were thrown together unnaturally, as it were, they hybridized.

The consequences of hybridization, especially introgressive hybridization, are likely to be profound, but as yet these have been little-studied. One thing we do know is this: first-generation juvenile hybrids move upstream much more extensively than do juveniles of either of the parental stocks. This implies that there will be a change in the ecological role of cutthroat trout populations once they become hybridized, and that implies a possible change in the functioning of the entire ecosystem of which they are a part. Stay tuned – more research is underway.

Although it may be less obvious, the problem is exactly analogous when non-native cutthroat stocks are introduced on top of native cutthroat stocks. In this case, however, introgression is much, much more likely.

The problem of native stocks hybridizing with non-native stocks would not be such an issue if their genetic make-ups were essentially the same. But in the case of westslope cutthroat trout, at least, this is not the case. In this species, most

of the genetic variation occurs among populations; there is relatively little variation within populations. Put another way, individual populations tend to be genetically different from one another – often they are unique. It seems highly likely that they are different because they are uniquely adapted to the different ecosystem that each population occupies. If so, there may well be ecosystem-level changes if a population is either lost or significantly changed by hybridization with an introduced, non-native stock.

Final Thoughts

I suggest there are a few basic conclusions we can make about exotic fishes that have been introduced into Alberta's waters. The first is that they are often accompanied by extensive, profound changes in habitat, and that their effects, therefore, are usually conflated with the effects of habitat change. Another is that, for largely unknown reasons, successfully introduced fishes can in some cases take over huge areas of habitat from our native species. And finally, as attested by at least one case, exotic species introductions have likely assisted in driving a unique Alberta native fish to extinction.

On the other hand, exotic introductions have given us a few pretty aquarium fish living wild in our oldest national park. We have two new trout to catch that we would have had to travel thousands of kilometres to catch otherwise. We have hundreds of weirdly maladapted stocks of Frankenfish hybrids to enjoy in place of the jewel-like native westslope cutthroat trout with which our forebears had to make do.

Has it been worth it? 🐾

Dave Mayhood is an aquatic ecologist and president of FWR Freshwater Research Limited in Calgary. In defence of the biologists responsible for most of the wreckage, he has this to say: "Many of them in their day were among the brightest in their fields. They worked within the paradigm of their times, not ours. Most of them were acting on the best evidence they had. Too often they were spectacularly, devastatingly, catastrophically, blindingly wrong. Too often they made things immeasurably worse. If you are really, really good at what you do, you are exactly like them. Sleep well."



"Bighorn Sheep #1" 48x36 inches, encaustic ©BIGOUDI



HEROES NEEDED TO KEEP INVASIONS AT BAY IN RUMSEY

By Cheryl Bradley

On a beautiful summer day in 2006, I was with a group of friends and colleagues enjoying the largest block of plains rough fescue grassland in the world – the Rumsey Natural Area and Ecological Reserve. We happened upon a narrow pipeline disturbance recently seeded to a robust tufted grass with comb-like seed heads. There was a collective gasp, followed by shocked silence. It was crested wheatgrass!

Here in the heart of this designated protected area north of Drumheller, a gas company employee had cast crested wheatgrass seeds onto the narrow strip of bare ground that ran several hundred metres from a wellsite to a connecting pipeline. We were facing another formidable foe in the heart of an area we were working to protect and restore.

Among those interested in preserving rough fescue grasslands, there is fear and loathing at the thought of crested wheatgrass, smooth brome grass, and Kentucky bluegrass getting a foothold in natural areas. These introduced species reduce biodiversity and wildlife habitat, and compromise the aesthetics of our native prairie ecosystems. They raise the spectre of prolonged battles of human energy and ingenuity against the powerful life force embodied in the seeds and spreading roots (rhizomes) of these invasive agronomic species.

Since agronomic species are chosen by landowners to plant for livestock forage, soil stabilization, or turf, our provincial weed law does not require their control. The effort to control or eradicate them in native grasslands must first be mobilized in government offices and industry boardrooms, and around the kitchen tables of landowners and leaseholders.

Southern Alberta's moist, loamy soils are similar to those in Europe and Asia, where crested wheatgrass (*Agropyron cristatum*), smooth brome (*Bromus inermis*), and Kentucky bluegrass



Spring 2008 – bright green tufts of crested wheatgrass are growing through vegetation killed with herbicide along a recently constructed pipeline in the Rumsey Natural Area.

PHOTO: C. BRADLEY

(*Poa pratensis*) originated. There are native elements of smooth brome and possibly Kentucky bluegrass in North America, which have interbred with their introduced cousins, but they did not occupy near the range of habitats that the introduced species do. Although one would expect native species to be better adapted than non-natives to their environment of origin, our native grasses tend to lose out in the fierce competition for resources with these species, which have the advantage of being unconstrained by the factors controlling their growth in their original habitats. The spreading roots of smooth brome and Kentucky bluegrass rapidly creep into small unoccupied spaces, seizing resources from native bunchgrasses such as rough fescue. The abundant seeds produced by crested wheatgrass germinate early in the spring, and the

vigorous seedlings get a head start on native grasses in the race for unoccupied space. Once they have occupied a site, the invaders do not give it up.

In drier mixedgrass prairie, smooth brome and Kentucky bluegrass are confined to moist draws, valleys, and wetlands. Crested wheatgrass, a native of the dry steppes of Siberia, survives under a broader range of climatic and site conditions, including upland sites of mixedgrass prairie. In the moister climate of central Alberta and the foothills where rough fescue grasslands occur, all three invasive grasses can persist and spread into all but the driest upland sites. They have the capacity to overwhelm native grasslands and dominate the modified plant community for many decades. An official acknowledgement that these modified communities will persist for the foreseeable future on a large proportion

of southern Alberta's rangelands occurred just a few years ago when government-issued foothills range guides were revised to recognize plant communities dominated by Kentucky bluegrass.

The plains rough fescue (*Festuca hallii*) grassland communities of central Alberta are at risk of extinction, and non-native species invasion is the biggest threat. A 2003 study found that more than one-third of grassland sites remaining in the Central Parkland Natural Subregion were predominantly non-native. Only one in ten sites had plains rough fescue communities, and about half of these had invasive agronomic species. The Northern Fescue Natural Subregion has experienced a similar loss of native grassland. Less than one-quarter of that subregion supports native vegetation, and only about 5 percent persists as plains rough fescue grassland. The native grasslands that remain are experiencing invasion of non-native species from roads, trails, fields, livestock use, and industrial and residential developments.

Managing sizable (>10 km²) natural areas to prevent and arrest invasion of non-native species is our best hope for preserving rough fescue grasslands. On a recent visit to the second-largest protected area in the Northern Fescue Subregion, the Hand Hills Ecological Reserve (22 km²), I was dismayed at the rapid spread of smooth brome into the undulating rough fescue grasslands. Brome's bright green sod occupies draws and depressions, and is fingering its way upward into more of the soft green rough fescue bunchgrass community. Attempts to reduce the cover and competitiveness of agronomic grasses in rough fescue grasslands using fire, mowing, herbicides, and livestock grazing have so far met with poor results.

The Rumsey Natural Area and Ecological Reserve (183.5 km²), which straddles the Central Parkland and Northern Fescue Subregions, offers our biggest and best opportunity to check the advance of invasive agronomics into plains rough fescue communities. The extent of invasive species in the protected area has yet to be fully documented. Ensuring that native vegetation remains in good condition is the most effective way to prevent invasion of Kentucky bluegrass, smooth brome, and crested wheatgrass. Where these species already occur, control measures tailored to the



A patch of smooth brome (outlined) has invaded plains rough fescue grassland from a nearby wellsite in the Rumsey Natural Area. PHOTO: C. BRADLEY

species and the site are needed.

Kentucky bluegrass has taken hold in some parts of Rumsey, particularly sites that were disturbed. Management to avoid industrial disturbances and overgrazing could prevent further spread. It is unlikely that Kentucky bluegrass will be eliminated from the sites it currently occupies. With proper management, however, co-dominance of rough fescue and Kentucky bluegrass will likely occur. Rough fescue will have a competitive advantage on drier sites in dry years, and Kentucky bluegrass on moister sites and in wet years.

Smooth brome has occupied some draws, wetlands, and industrial disturbances on moist sites in the protected area. Its spread may be checked by control efforts such as shading, herbicide wiping, and early-season mowing or grazing targeted specifically at the occupied sites. Repeated treatment over several years will be required. Follow-up seeding with desirable species may help prevent its regrowth. New disturbances need to be avoided.

Crested wheatgrass has been seeded and is invading at only a few industrial sites. Targeted application of herbicide through wiping early in the spring, prior to seed formation, is likely the most effective control measure. This will need to be done several years in a row to exhaust the seed bank. Native seeds will need to be planted to fill the gaps. A key measure is to ensure that no more crested wheatgrass seed is introduced.

Working against attempts to preserve plains rough fescue grasslands and

control invasive agronomics in the Rumsey Natural Area and Ecological Reserve are those who wish to undertake new gas development, thereby increasing disturbance and risk of invasion. There also are issues around ill-defined range management. Fortunately, a reclamation advisory committee is working to address some of the issues, but ongoing approvals for pipeline and well construction confound their efforts.

On another beautiful day this past spring, I again visited the site in the heart of the Rumsey protected area where crested wheatgrass seed had been scattered along the narrow pipeline right-of-way a few years earlier. I found patches of dead vegetation where herbicide had been applied the previous year. At least someone was trying to address the problem. Green tufts of crested wheatgrass, however, were growing in these patches and had advanced several metres up a hillside. Seed was already being produced. I reflected on the powerful life force of invasive agronomics and the powerful human forces, including greed for the profits of non-renewable energy production, that are leading to death-by-a-thousand-cuts of our native rough fescue grasslands. These are formidable forces. It will take heroic efforts to overcome them. 🍷

Cheryl Bradley is a professional botanist living in Lethbridge. She has worked in prairie environments for three decades. She currently serves as southern director for the Alberta Native Plant Council.

ALBERTA'S WEED CONTROL ACT – AN OUNCE OF PREVENTION OR A POUND OF CURE?

By Glennis M. Lewis

Alberta has a long history of legislating against weeds that reduce crop and garden production and threaten livestock health. The first provincial act, the 1907 *Noxious Weeds Act*, and preceding NWT weed ordinances, embodied the principle that no one's land should be a sanctuary from which weeds can spread.

Alberta's current *Weed Control Act* retains the key features of that early legislation, but it also provides a basis for addressing the more modern concern about impacts of invasive species on natural ecosystems. The Act is not up to this important task, however, particularly in preventing the introduction of invasive plants into new habitats and forcing eradication before populations become large and widely dispersed.

The *Weed Control Act* applies only to plant species designated as weeds in the Weed Regulation. Local authorities can pass bylaws designating plants in municipalities as weeds, but the bylaws are subject to approval by the province. The Act identifies three categories of designated weeds: restricted, noxious, and nuisance. The duties of land occupants (or with unoccupied lands, the owner) vary according to each category. Restricted weeds must be destroyed, noxious weeds must be controlled (by destroying them or using methods prescribed by an inspector), and nuisance weeds need only be prevented from spreading.

Because of the choice of plants designated as weeds, the strong powers of the Act fall short in that they are used in a reactive rather than preventive way to address invasive plants. The current Weed Regulation and relevant municipal bylaws are oriented to agricultural and urban weeds (e.g., Canada thistle, sow thistle) and invasive plants that have already become widely established (leafy spurge, purple loosestrife). Other plants that are highly invasive in some parts of Alberta or only starting to become invasive throughout the province (Russian olive, baby's breath)



The author, pictured here with the highly invasive Japanese knotweed.

PHOTO: J. FREEMAN

are conspicuously absent. Furthermore, no criteria are given for the designation of plants as weeds or their removal from such designation.

A more proactive approach would see plants listed as weeds even before they are established in the province if there is good evidence that they could become invasive. A case in point is saltcedar, a plant that has aggressively invaded thousands of hectares of riparian habitats in the U.S. with devastating effects on biodiversity. This plant could severely threaten similar habitats if it becomes established in Alberta. Listing it as a weed under the *Weed Control Act* would require its destruction or control as soon as it appears in the province.

An example of this kind of legal preparedness can be seen in B.C.'s Regional District of Central Okanagan, which in 2005 passed a weed bylaw that lists Kudzu vine as a noxious weed. This highly invasive vine has not yet been

found in B.C., but there is a possibility that it could invade from the U.S.

The real challenge lies in addressing the sale and purchase of potentially invasive or invasive plants from plant nurseries and seed houses. Assessment of such plants imported from international nurseries and seed houses falls to the federal government. However, potentially invasive plants in containers or seed packages sold by Alberta nurseries could be designated as weeds under the Act to prevent their sale. For local nurseries that sell plants designated as weeds, and those purchasers who plant them on their lands, the *Weed Control Act* should be enforced more rigorously.

It may be surprising that Alberta gardeners can easily purchase a potentially dangerous plant like saltcedar from sources outside the province as well as from some local nurseries. Alberta Agriculture and Rural Development recently issued a weed alert asking gardeners not to plant it, but it is not illegal to do so.

The battle to protect natural ecosystems from invasive plants requires a number of different approaches such as raising public awareness, providing resources for research, and establishing monitoring programs. However, sound laws aimed at combating invasive plants are important as well. The time is right to urge the Alberta government to revisit what plants are subject to the *Weed Control Act* and develop criteria for designations. This will allow the Act to be used more effectively to protect Alberta's natural ecosystems from the threat of invasive plants. After all, when it comes to protecting Alberta's natural ecosystems from invasive plants, an ounce of prevention is worth a pound of cure. 🌱

Glennis M. Lewis is a lawyer/ecologist based in Ottawa. In 2006, she completed an LL.M. thesis at the Faculty of Law, University of Ottawa, examining how weed laws apply to invasive plants in natural ecosystems.



ALBERTA'S PINE TREES AT RISK – ARE WE AIMING AT THE RIGHT TARGET?

By Nigel Douglas, AWA Conservation Specialist

“A destructive alien invasive pest is continuing its insidious spread into Alberta, killing healthy, mature pine trees and leaving behind a landscape of sad, rust-red skeletons in its wake.”

If this were to appear in a news report, the now-familiar scapegoat – the mountain pine beetle – would probably spring to mind. But pine beetles are native invertebrates that have been in our forests for thousands of years, and forests have evolved over countless generations to deal with their periodic outbreaks.

No, the culprit here would have to be pine blister rust, which receives considerably less media coverage than the pine beetle but has the potential to damage native ecosystems on an unprecedented scale.

In contrast to the hyperbole that has surrounded Alberta's latest pine beetle outbreak (pine beetles have apparently “destroyed” our forests, and in 2006 the provincial government declared a “state of emergency” to deal with the problem), the lack of attention on the blister rust has been astonishing. The Alberta government has allocated \$134.3 million over the past two years to fight pine beetles, but very little has been done even to study the enormous potential impact of pine blister rust.

Pine blister rust is caused by the rust fungus *Cronartium ribicola*, introduced into North America from Asia around 1900 via seedlings grown in European nurseries. By the 1950s, it had spread across North America. The disease affects five-needle pine trees – in Alberta, that means mostly limber and whitebark pine.

Limber pines, which can grow to be a thousand years old, are the stately ridge-top giants so typical of areas such as the Whaleback or the Porcupine Hills. Also found in southern Alberta are huge old whitebark pine trees, whose copious quantities of high energy seeds provide a vital food source for grizzly bears in some areas. They are also notable for



The limber pine (Pinus flexilis) thrives in harsh, windswept conditions, such as on this hillside in Alberta's Porcupine Hills. An invasive non-native fungus, white pine blister rust, is partly responsible for the decline of limber pine throughout most of its range in Alberta. PHOTO: C. OLSON

their fascinating symbiotic relationship with the Clark's nutcracker, upon which they rely entirely for seed dispersal. In the fall, the nutcrackers collect whitebark seeds in thousands, burying them far and wide, to be retrieved later. But the nutcrackers are notably absent-minded and many of the seeds remain buried, allowing them to germinate the following spring. A province bereft of its limber and whitebark pine trees would be a truly diminished place.

Two species, one native and one not, are both having serious effects on pine trees in Alberta. Why the discrepancy in level of concern? Whitebark pines and limber pines, the principal targets of pine blister rust, have little commercial value in Alberta. In contrast, the lodgepole pine, the favourite Alberta host of the mountain pine beetle, is one of the mainstays of the commercial forestry industry throughout Alberta. It is the threat to forestry operations, rather than the forests themselves, that seems to be behind the huge efforts to “fix” the pine beetle “problem.”

AWA has argued for many years that pine beetles may harm forestry, but they don't necessarily harm forests. A forest is a complex system of trees, shrubs, flowers, mosses, lichens, dead wood, mammals, birds, insects, soil micro-organisms, soil, water, and air. Pine beetles may kill some pine trees (not the young ones) but, unlike salvage forestry operations, they do not affect spruce, fir, or deciduous trees, nor do they destroy understorey plants, mosses, or soils.

As part of AWA's ongoing research program in the Castle region of southwest Alberta, Reg Ernst has been studying the health of whitebark pine trees for the past three years. This year, he is researching the possibility of collecting seeds from apparently disease-resistant trees and planting them on site to encourage growth of resistant trees.

On Thursday, August 21, you can join Reg and AWA staff on Prairie Bluff to learn more about this project, as well as Reg's recent rare plant surveys and plant regeneration studies. (See p. 30.) 🐾



WEED INVASION IN ALBERTA'S RIVER VALLEY CORRIDORS

By Stewart B. Rood and Andrea R. Kalischuk

Rivers and creeks represent linear landscape features that flow through watersheds and provide vibrant corridors for fish and aquatic ecosystems. Flanking these streams, riparian zones include floodplains and other low-lying environments that provide interfaces between land and water. In Alberta and throughout the Northern Hemisphere, riparian ecosystems are commonly dominated by cottonwood trees and willow shrubs; these floodplain forests provide exceptionally rich wildlife habitats and are favoured zones for human development and for recreation.

Disturbance and Development

River valleys are characterized by two processes: disturbance and development. Disturbance refers to abrupt change, and physical disturbance is a natural and common process in river valleys. Swift-flowing flood waters erode and transport gravels, sands, and silts, and scour vegetation. Ice events, especially the spring break-up, provide another natural physical disturbance that characterizes river valleys across Canada.

Floods or ice events produce barren riparian zones that are scoured of vegetation and covered with moist sediments. These conditions are ideal for the seedling establishment of new plants, including native plants as well as deliberately or accidentally introduced foreign, or exotic, species. The flood and ice events also sever established vegetation and shear shoot and root fragments, which are deposited along with the moist sediments. This provides ideal conditions for clonal reproduction, which is common for the native willows and cottonwoods, and for some of the foreign species.

Of the foreign plants, "weeds" are undesirable species that are often characterized by the capacity for prolific seed production and subsequent vigorous colonization. The natural physical disturbances that characterize riparian

zones make these areas especially vulnerable to weed invasion.

Compounding this natural vulnerability, the abundant human developments in river valleys further introduce weed seeds and vegetative fragments. River valleys have long provided preferred human transportation routes, commencing with the navigable corridors that allowed the European exploration of western North America. Due to their gradual slopes through mountains and hilly regions, river valleys remain as favoured transportation routes for roadways and rail lines.

The development of these transportation corridors involves mechanical excavation that creates additional barren areas, enabling even more weed expansion. The excavation machinery can even transport weed seeds and fragments, compounding the problem. In addition, all-terrain vehicle recreation provides another artificial disturbance that disperses weeds,

particularly along Alberta's headwater streams in the public lands of the Rocky Mountains and foothills.

Being relatively flat and adjacent to water, the fertile floodplain zones and river valley terraces are also preferred areas for agricultural production. Riparian woodlands are cleared for crop production, and the land is cultivated and seeded. Weed seeds are commonly introduced by agricultural equipment and the vehicles that transport the agricultural inputs and products.

In Alberta, as elsewhere, riparian areas are also chosen for livestock production, especially cattle. The cattle trampling provides yet another disturbance that can further weed invasion. Cattle browsing can amplify weed problems since cattle preferentially graze some species, often native plants, while weeds such as thistles are unpalatable, providing a competitive advantage.



Remnant trunks beside the St. Mary River near Lethbridge provide evidence of a narrowleaf cottonwood grove prior to the 1951 implementation of the St. Mary Dam, which led to severe reductions in the summer flows below the dam. While the cottonwoods and willows collapsed, leafy spurge invaded and is now the dominant plant in many locations below the dam. PHOTO: S. ROOD

Riparian Weeds in Alberta

It's tragic that perhaps the single most useful plant identification guide for riparian zones in western North America is *Weeds of the West*. In many river valleys in the western U.S., and in some in southern Alberta, the riparian plant communities have become dominated by exotic weeds over the twentieth century. The specific weeds vary somewhat across rivers and regions, and two particular species are especially troublesome in southern Alberta.

Leafy Spurge – Chemical Warfare and Biocontrol

Leafy spurge (*Euphorbia esula*) is an introduced perennial weed that has infested large areas of riparian zones and rangelands in western North America. It was first reported in Alberta in 1933, and by 1995 it covered more than 6,000 hectares in the central and southern parts of the province. Leafy spurge further expanded along many riparian areas following the major 1995 flood of many of Alberta's southern streams.

The success of leafy spurge is partly due to the production of toxic, milky latex in its stems. The latex contains a number of alkaloids that discourage browsing by native herbivores and by cattle. The plant produces numerous seeds, can propagate from fragments, and spreads aggressively from a very resilient root system.

Leafy spurge weed-control exemplifies the fight that has been undertaken with many riparian weeds in Alberta. With its initial introduction to an area, early attempts to control it involved pulling the plants, but the removal was rarely complete and the plant expanded further. Subsequently, two strategies were attempted to reduce seed production and subsequent expansion: mowing and sheep grazing. However, these assaults on the leafy spurge stems were insufficient as the root systems remained intact and regrowth was often vigorous.

Another attempt to control leafy spurge was through herbicides. However, chemical control is especially difficult in riparian zones since these are adjacent to surface waters that shouldn't be polluted. The irregular terrain of riparian zones precludes the use of large spray machinery, and the use of backpack-mounted herbicide sprays is very expensive and prone to chemical drift



Russian olive near the junction of the St. Mary and Oldman rivers, near Lethbridge. This drought-hardy, introduced tree is popular for landscape plantings in Alberta's prairie regions but can subsequently expand along river valleys as the large seeds are dispersed by birds. PHOTO: S. ROOD

with the ubiquitous winds of southern Alberta.

In its native settings of Eurasia, leafy spurge has abundant natural enemies, including a broad range of insect herbivores. No natural insect enemies exist in Canada, but since 1970, 18 European insects have been released for biological control of leafy spurge. Each insect species is screened prior to its release to avoid impacts on native or crop plants.

The most successful insects for controlling leafy spurge have been the flea beetles, *Aphthona* species. The larvae of these beetles feed on the roots, and the adult beetles feed on stems.

In Alberta, two species have provided some success. The black dot spurge beetle tends to prefer dry, sandy soils and has been relatively successful in the Edmonton area and in riparian zones along Lee Creek, near Cardston. The brown-legged spurge beetle prefers moist, loamy sites and has been successful at controlling small patches of spurge at sites around Millarville, Fort Macleod, Taber, and Bow Island.

While some successes have been achieved, biological control in river valleys is often difficult because of

natural microclimates. Substrates vary substantially in texture and moisture, and sun or shade can produce dramatically different habitats. In many cases, biocontrol is not achieved, even with multiple species of insects.

Reed Canary Grass – A Superior Competitor

While leafy spurge is a concern in both upland and riparian zones of Alberta, reed canary grass (*Phalaris arundinacea*) is generally limited to riparian areas. This vigorous grass was deliberately planted in many areas of western North America as forage for livestock or for protection against bank erosion. It is probably native to some regions of North America, but cultivars from Eurasia have been introduced and subsequent hybridization has probably produced more invasive lines.

Along streams in southern and central Alberta, reed canary grass can form extremely dense bands and stretch through the riparian area right to the water's edge; this excludes subsequent colonization of native plants such as willows and cottonwoods. The control of reed canary grass is very difficult due to its vigorous growth and its capacity for



Reed canary grass along the Crownsnest River in southwestern Alberta. High flows scour riparian vegetation, sometimes removing riparian weeds, but the seeds, shoots, and roots of many weeds are also flushed downstream, allowing expansion along the river corridor. PHOTO: S. ROOD

rapid clonal expansion, which allows it to quickly dominate an area. While cattle or native ungulate grazing pressure may restrict reed canary grass expansion, it often alters the plant community of riparian zones, producing a number of ecological impacts.

Saltcedar and Russian Olive – Weed Trees

Woody plants, shrubs, and trees are especially important in defining riparian woodlands and providing the “structure,” or vertical distribution, that is critical for many birds and other organisms. While riparian areas generally benefit from trees, invasive trees are threats to riparian ecosystem health and function.

Throughout the American southwest, the introduced saltcedar, or tamarisk (*Tamarix* spp.), is widely regarded as the most serious riparian threat in that region. Unfortunately, saltcedar is progressively moving northward and has already invaded reservoir fringes and some riparian zones in northern Montana. Its further northward expansion into Alberta is almost inevitable.

While saltcedar is a future concern, another weed tree, Russian olive (*Elaeagnus angustifolia*), is a current concern for a few provincial river reaches such as the Milk River, Alberta’s southernmost river. Russian olive is an

attractive, drought-tolerant, hardy species that is often favoured for ornamental plantings in Lethbridge and Medicine Hat. It produces large seeds that are dispersed by birds and often result in “volunteer” trees, which can commonly be found along the fringes of ponds and wetlands as well as in some riparian areas.

Russian olive is closely related to a prominent native shrub of Alberta, wolf-willow or silverberry (*Elaeagnus commutate*). Wolf-willow is a facultative riparian plant – that is, one that is common in streamside zones but also occurs, generally more sparsely, in upland areas. With the taxonomic relatedness, Russian olive is more likely to provide habitat and ecological value than more “foreign” species such as saltcedar and might thus be of a lower concern than saltcedar with regard to control.

Integrated Pest Management and the Natural River Regime

While biocontrol may offer a promising current strategy for the control of leafy spurge and some other riparian weeds, it is only one part of the appropriate solution. The best control of riparian weeds involves an integrated pest management approach, which involves multiple approaches that seek to restrict initial invasion and minimize subsequent

expansion. Control measures should be implemented within a broader management strategy that promotes the conservation and even restoration of the natural plant community.

For example, the lower St. Mary River valley may provide the most severely spurge-infested riverscape in Alberta, and the problem resulted in part from the extreme alteration to the instream flow pattern that led to the collapse of the native cottonwoods and willows (see photo, p. 16). In contrast, instream flow regimes were more favourable along the adjacent Belly and Waterton rivers, and with the reasonable health of the willow and cottonwood groves, weed invasion has been much less severe than along the St. Mary River.

The “natural flow regime” provides a current paradigm for river resource management in which managers seek to provide an instream flow regime that mimics the natural pattern. This includes variations within and across years, as well as aspects such as gradual flow reductions, which permit the survival of new seedlings of cottonwoods, willows, and other native plants.

Given the natural importance of physical disturbances, it may be appropriate to broaden this strategy to allow the “natural river regime,” in which floods and ice events are also recognized as part of the natural system. Native plants are generally tolerant of these natural disturbance events while some non-native weeds may be much more vulnerable. As with the implementation of biocontrol, there should be cautious re-establishment of the natural river regime; careful study is essential to analyze the consequences to native species and invasive weeds. The war on riparian weeds will extend for decades and better knowledge may be our ultimate weapon. 🐾

Stewart Rood is a Professor of Environmental Science at the University of Lethbridge, and Andrea Kalischuk is the Water Quality Section Head with Alberta Agriculture and Rural Development in Lethbridge. They have worked together on various projects analyzing the health of riparian woodlands throughout southern Alberta and across western North America.

AWA Launches Water Analysis of Panther River

In February, AWA reported on the unbridled development along the Panther River in the Bighorn and our concerns with this urbanization of Alberta's wilderness. To better understand impacts on the river by development of four Alberta Tourism Recreational Leases (ATRLs) occupying land on the south shore, AWA initiated a water quality study this summer.

During a field trip last December, we found an unprecedented level of development, including large numbers of permanent structures and overwintering camping trailers. In some cases, structures and accoutrements were within mere metres of the river bank. As well as being pressed right up to the bank of the Panther River, these ATRLs lie on its historic flood plain. In fact, one section of land currently leased is an old road that had to be abandoned and replaced with a new road on higher ground due to consistent seasonal flooding.

Should significant flooding occur, dwellings, debris, and the myriad trappings of these outfits, such as fuel tanks, outhouses, and manure piles, may wash into the river. Even without a flood event, human and animal waste, as well as spilled fuel and chemicals, may be leaching into the river.

AWA is concerned about how these developments may be affecting aquatic ecosystems and compromising the security of a clean water source for humans and wildlife downstream, especially as the Panther River empties into the Red Deer River, one of Alberta's major waterways.

Over the summer, volunteers and staff will be taking water samples at sites along the Panther and Red Deer Rivers. Analysis will include water chemistry and microbiology (e.g., *E. coli*). Should we find results of significant concern, we will report to Alberta Environment, request a follow-up study to be completed by the province, and call for a review by Sustainable Resource Development regarding the appropriateness of these ATRLs along the Panther River.

– Chris Wearmouth

EnCana's Dickensian Court Case

EnCana's multiple appearances in Medicine Hat Court, on charges of violating Canada's *Wildlife Act* within the Suffield National Wildlife Area, are beginning to resemble *Bleak House*, the story of a legal battle over an inheritance that eventually drained the legacy fund dry. In this case, though, it's Canadian taxpayers picking up the tab for the Crown's legal costs.

The company has appeared in court six times, with their seventh appearance scheduled for August 12. Each time, the case has been adjourned because of EnCana's claim that they need more time to review the evidence against them. They have not yet entered a plea.

"This is the third counsel in a row who has come on with respect to these matters," said Judge Legrandeur during EnCana's June 26 appearance, when EnCana changed lawyers once again. "They'll certainly require more time to review the disclosure."

The repeated adjournments are certainly in the company's best interests. With the Joint Review Panel hearing into EnCana's proposal for an extensive shallow gas infill project in the Suffield National Wildlife Area scheduled to begin on October 6, the bad press that would inevitably accompany a guilty verdict would be undesirable for the company.

AWA will be an intervener at the hearing as part of a six-group coalition opposing the project. For more information, see our website at www.AlbertaWilderness.ca.

– Joyce Hildebrand



PHOTO: C. OLSON

Proposed Sour Gas Development in K-Country

In fall 2008, AWA will be publicly voicing its opposition to Petro-Canada's new development plans in southern Kananaskis Country. Originally scheduled for August 18, the Energy Resource Conservation Board (ERCB) hearing is now scheduled to begin on November 12 in High River.

The proposed development would see 11 new sour gas wells from five well pads (with accompanying infrastructure) drilled in the Bull Creek Hills area of Kananaskis, just north of Hwy 541 and the Eden Valley Reserve. The 37-km pipeline would run south from there, through a low-lying valley and across several creeks, ending up at Indian Graves on Hwy 532. From here it would join an existing Petro-Canada pipeline, which would be upgraded. The upgraded pipeline would then run west to Petro-Canada's existing Savanna facility, not far from Plateau Mountain Ecological Reserve.

If it goes ahead, the project will likely have negative effects on habitat for wildlife such as grizzly bears. It is also expected to impact creeks supporting some of the few known remaining populations of unhybridized westslope cutthroat trout. There is also a considerable risk that the pipeline work will facilitate illegal off-highway vehicle access along the pipeline right-of-way – something that threatened grizzly and trout populations certainly do not need.

To their credit, over the past three years, Petro-Canada has done an excellent job of keeping AWA and other stakeholders informed of its development plans and has made serious attempts to minimize the impacts of the proposed wells and pipeline.

But AWA still believes that the development plans should be suspended until the government's Land-Use Framework process comes on-stream. The effects of this proposal must be fully understood within the context of the many other activities already taking place on the same sensitive landscape.

– Nigel Douglas

Albertans Lose Scent of Wolf Sterilization Project

The scent may have gone cold for Alberta's public, but AWA continues to track the story of killing wolves for research in Alberta.

Last November, AWA learned of a research project near Rocky Mountain House that would trap and sterilize four "alpha pairs" of wolves while exterminating the rest of their packs. This joint project of the Government of Alberta and the University of Alberta is being carried out in hopes of increasing ungulate populations, especially elk, arguably to keep numbers up for hunting.

When the story hit the media, the flurry of responses from Albertans was staggering. The outcry against the project was loud and clear. But one week's hot topic quickly becomes the next week's dusty column – there has been little word since spring regarding the research.

According to Anne Hubbs, a senior wildlife biologist with Sustainable Resource Development, the project is still in the initial phase of capturing and collaring 3 members from each of 14 packs in the area. So far, 16 wolves have been collared from 9 packs. After collaring, the project will move to the stage of sterilization and slaughter, slated to begin this winter. Hubbs told AWA that a committee is being formed with 8 to 10 wolf experts, who will comment on the project's merits and offer recommendations on the methods of research.

Wolf predation is a pressure on ungulate populations, particularly caribou (which are not found in the research area), but killing wolves instead of dealing with the real issue of habitat destruction is as effective as putting a band-aid on a deadly wound. Without real protection for wildlife habitat of a size that can allow for natural predator-prey cycles, we will be forced to continue to micro-manage our environment with tools that should only be used as a last resort to correct serious errors on our part or stave off the extinction of a species.

Hubbs informed us that there are plans to convene a stakeholder committee to which AWA would be invited. As this research moves into future stages, AWA will continue to exert pressure to stop the needless killing of wolves for research and recreational pursuits.

– Chris Wearmouth

Draft Management Plan for K-Country PRAs

Public input is being sought on a new draft management plan covering 51 Provincial Recreation Areas (PRAs) in Kananaskis Country and the Ghost-Waiparous region. PRA designation offers the least "protection" of Alberta's many different protected area designations.

AWA is generally supportive of the draft plan, but with certain reservations. Many of the proposals within the draft plan are administrative, including the redesignation of PRAs along the Elbow River as the Elbow Valley Provincial Park. We believe there is ample opportunity to extend this proposed Provincial Park in future to reflect the growing appreciation of the need for better protection of the Elbow River watershed, the source of Calgary's water.

One proposal that AWA strongly opposes is the plan to allow for future fixed-roof developments in certain areas, including the Elbow Falls. There is no role for more accommodation and other fixed developments within Kananaskis: these need to be kept to outlying "gateway communities" such as Bragg Creek, Canmore, and Turner Valley/Black Diamond.

AWA has long argued that there is a need for a comprehensive planning process for the whole of Kananaskis. Approximately 60 percent of Kananaskis Country is currently protected, with the remainder managed for "multiple use," including industrial activity. In recent years, plans have been released piecemeal for some of the protected areas, including the Evan Thomas PRA and Peter Lougheed Provincial Park. But AWA believes that the time is well overdue to revisit the future role of Kananaskis in the lives of southern Alberta residents. In an increasingly human-impacted landscape, our priorities have changed significantly since Kananaskis Country was designated in the late 1970s.

The draft plan can be seen online at tprc.alberta.ca. The closing date for comments is September 30, 2008. AWA's comments on the plan are at AlbertaWilderness.ca.

– Nigel Douglas

New Plan for Parks Remains Grounded

Alberta's new Plan for Parks seems destined to remain hooded like a pet falcon, making it impossible for it to take flight. Multiple delays have moved the plan to the bottom of the political pecking order – almost a year has gone by since we reported on the new plan (WLA, October 2007).

At that time, Tourism, Parks and Recreation (TPR) was developing the new policy, which seemed focused primarily on addressing capacity issues and infrastructure. After TPR submitted the plan last fall, Cabinet asked that it be stripped down to the essentials, and that any budget requests attached to the plan be removed for approval later.

The plan was to be resubmitted to Cabinet in January, but with an election looming, the Parks Department was not called to bring it forward. Once the politicians had smoothed their new feathers, the plan once again poked out its beak, only to be pushed back by its big brother, the Land-Use Framework (LUF). Released in late May, the draft LUF is meant to be the overarching policy for managing the province's land base. To ensure that the Plan for Parks aligns with LUF directives, TPR Minister Cindy Ady is working with colleagues, including Sustainable Resource Development staff. Initial consultation with key stakeholders is planned to begin this fall.

When the plan finally becomes public, AWA hopes to see more than just concern with our growing population's recreational pursuits and the infrastructure to support them. We need real protection for wilderness, protection that safeguards it from development, including tourism, while allowing for sustainable low-impact recreation. We hope to see as a top priority the completion of the parks network through the creation of new protected areas.

The plan should also address the need for protection of corridors between areas, the creation of buffer zones, effective public consultation, and the resources to properly educate visitors and enforce regulations. Any policy that is to govern the future of Alberta's parks and protected areas must have the claws and strength of wing to ensure genuine security for the province's wild places.

– Chris Wearmouth



HYDRO PROJECT TO DIMINISH THE MIGHTY PEACE

By Chris Wearmouth, AWA Conservation Specialist

The Peace River valley is something to behold on a winter's day. As my friend and I picked our way through chocks of heaved ice littering the valley bottom, families of deer peered down from high overhead along the rim of farmers' fields. The mighty Peace River was festooned with a crosshatch of ice floes run aground. A ribbon of open water snaked through the blocks, in places a third of its summer's meandering width.

We watched as a moose exited the woods from the north and high-stepped its way toward the moving water. Between our own footsteps ran the tracks of coyote, deer, and over-wintering birds, the snow a stamped record of winter activity. Coming to rest on a grassy bank gone brown, we found tree stumps with their woody crowns missing, the rough-hewn cones a tell-tale sign of the beaver that had lumbered here. The most striking sense of the area was that, as the call of birds attested, even during winter, this place is alive – dynamically, unequivocally alive.

But this may not be the case for long. The place where we wandered for a late-winter picnic on this year's Easter weekend is the site for Glacier Power's proposed run-of-the-river hydro-electric dam.

Currently in the process of a joint review by the Canadian Environmental Assessment Agency (CEAA), the Alberta Utilities Commission (AUC), and the Natural Resources Conservation Board (NRCB), Glacier Power's proposal is to erect an 11-metre-high dam across the width of the Peace River two kilometres upstream of Dunvegan Provincial Park, southwest of the town of Fairview, Alberta. What will follow will be the flooding of productive riparian and valley lands, the alteration of the river's ice regime, and the creation of an obstruction for fish across the entire width of the river.

"The Peace River is one of Canada's



The Peace River valley near the site of the proposed Dunvegan dam. The valley provides some of the last intact parkland habitat in the region. PHOTO: C. WEARMOUTH

grandest rivers," says Alberta Wilderness Association Director Vivian Pharis. "The Mighty Peace of my childhood is no more. Having been tamed with two dams in the canyon above Hudson's Hope in the 1960s and 1970s, destroying the famous Gold Bar ranch, significant dinosaur remains, and a vast wild and diverse valley ecosystem, the river is now under consideration for more dams and destruction. There has never been a better time for honest, full-cost accounting before mistakes are made."

The Peace River begins in the northern Rockies of British Columbia and winds its course for 1,923 km from the headwaters of the Finlay River to Lake Athabasca. Along the way it drains an area of approximately 302,500 km². Recognized as a nationally significant waterway, the river is home to several species of fish, including bull trout and rare large scale suckers. Its encompassing valley is key year-round habitat for moose, elk, and deer, as well as

significant habitat for birds of prey such as golden eagle, bald eagle, and osprey.

It was the Peace River by which Alexander Mackenzie successfully pioneered a route across the North American continent, having four years earlier mistakenly ended up at the Arctic Ocean on the northern river that now bears his name. In 1793, as the first European to paddle and pull his way upstream past the mouth of the Smoky River, he found a wonder of wilderness, which he exalted in his journal: "The river displayed a succession of the most beautiful scenery I had ever beheld... This magnificent theatre of nature has all the decorations which the trees and animals of the country can afford it."

The river valley as discovered by Mackenzie and his crew was a wilderness previously known only to the Beaver and Cree who inhabited the area. Today, the land above the valley is a patchwork of agriculture; the larger basin is dotted with cutblocks, Fort Dunvegan is a popular

leisure spot for locals, and river boats motor their way up and down the Peace. Across the border in B.C., the river is the site of two hydro-electric dams, the Peace Canyon Dam and the W.A.C. Bennett Dam, which inundated the territorial home of the Tsay Keh Dene and formed the 251-km-long Williston Lake. Now a third dam on the B.C. side, “Site C,” is on the table.

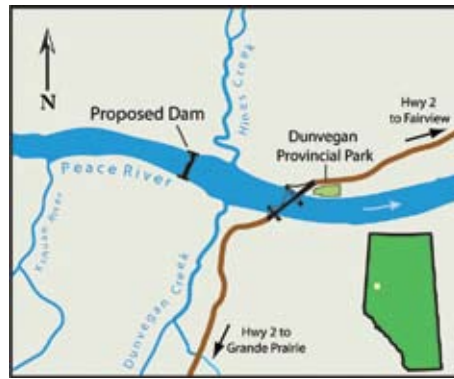
Despite the changes on surrounding lands, the obstructions upstream, and the occasional rumbling of a motor boat, the Peace remains a wilderness corridor snaking through Parkland and Boreal Natural Regions. Its Alberta waters still run free of impediment from the Alberta-B.C. border to where it empties into the Peace-Athabasca Delta, one of the world’s largest freshwater deltas.

The vision of a power-generating dam on the mighty Peace is not new. Since before the first feasibility studies of the Dunvegan area were done in the mid-1970s, there has been talk of harnessing its waters. Over the years, different sites have been proposed, but Dunvegan has continued to be the most widely cited.

Most recently, Glacier Power filed an earlier application in 2000 to develop a run-of-the-river dam at Dunvegan. After almost three years passed while the application was reviewed, it was denied by a joint Energy Utilities Board and NRCB panel. In its decision, the panel stated that “while each of the potential negative economic, social, and environmental effects of the project, if they were to occur, are substantive on their own, their cumulative effect clearly outweighs the social and economic benefits of the project to the local community, as well as to Albertans in general.”

Glacier Power has now reapplied with a new Environmental Impact Assessment (EIA) that it hopes will address concerns expressed by stakeholders and the panel in the earlier review. The new proposal calls for the construction of an 11.4-metre-high weir that would span the Peace, a width of 400 metres at the site.

The dam would raise water levels behind it approximately 6.6 metres, creating a headpond running upstream 26 km and inundating 106 to 215 hectares of surrounding land, depending on river fluctuations. Once in operation, the run-of-the-river project would not regulate the flow rate of the river like larger,



Approximate location of Glacier Power’s proposed hydro-electric dam on the Peace River. AWA is opposed to the project due to its likely impacts on wilderness values, including fish survival and aquatic habitat
MAP: AWA FILES

traditional dams but would generate power as the water moves freely – it is hoped at its normal rate – through the turbines.

Although hydro-electric projects are often marketed as producing green energy, with photos of clear running rivers frequently present and plumes of black smoke noticeably absent, any obstruction to a moving waterway has impacts. Run-of-the-river projects are touted as being less intrusive with smaller structures and an attempt to maintain the river’s natural flow, but they still present problems that need to be assessed accurately, as is the case with Glacier Power’s Dunvegan project.

Of major concern is how the project will affect the river’s fish populations. The Peace River is home to several species listed as sensitive by the province, including bull trout, arctic grayling, large scale suckers, and northern pikeminnow. Even though the dam plans include “fish-friendly” turbines and fish ladders, Glacier Power’s own Environmental Impact Assessment states that the project will have a “significant adverse effect” on local fish populations. As well, the creation of the headpond will prevent some species from using portions of the area for their life requisites.

With the dam will also come a delay in winter ice formation downstream, and nearer to the dam ice will not form at all unless it’s a colder than usual season. This will make it harder for wildlife to cross from one side of the valley to the other as they forage during the most difficult time of the year.

But perhaps the biggest threat to the Peace River is the precedent Glacier

Power could set for development on this mighty watercourse. The B.C. section of the Peace is already heavily impacted, and with this one project approved, the doors may be opened to allow for future development of power-generating weirs on the Alberta side. If that were to follow, we would possibly be looking at the end of wilderness in the Peace River valley as, one after another, gaps would appear in the corridor, compounding the damage.

It is with these concerns in mind that AWA is opposing the project. We plan to fully participate in the public process regarding this project and have formed a coalition with Canadian Parks and Wilderness Society (CPAWS, Northern Alberta Chapter), South Peace Environment Association, and Peace Parkland Naturalists. “With the cumulative effects on the Peace River caused by the dams in B.C., agriculture, and forestry and petroleum industries, it is time to stop new development that will further impact its ability to act as a healthy, naturally functioning ecosystem,” says Helene Walsh of CPAWS.

In July, a three-member CEAA, AUC, and NRCB Joint Review Panel was established to review Glacier Power’s application. As we go to press, we are awaiting the announcement of a public hearing, which must be called within the first 45 days after establishing the panel. AWA received participant funding on behalf of the coalition by CEAA and plans to retain the expertise of a fish biologist and legal counsel to assist in making our presentation to the panel.

If our plea falls on deaf ears and Glacier Power’s dam goes ahead, seasonal birds may continue to chirp and shrill in the valley, and deer – who seem to adapt easily – may still forage at field’s edge, but the area will lose its wildness, a characteristic that is under threat these days across Alberta, where “cultivated,” “developed,” and “domesticated” seem to be the ruling adjectives.

If the Dunvegan Hydro-electric Project becomes reality, it is not merely the loss of fish and other wildlife impacts we should lament, but also the death of the idea that in Alberta a mighty river can run free and wilderness can be found only a few kilometres upstream on a winter’s day. 🌿

MCLEAN CREEK DEBACLE CRYSTALLIZES OHV ISSUES IN ALBERTA

By Chris Wearmouth, AWA Conservation Specialist

It has become a tradition, if a sordid one. And while it surely happens across the province as legions head out for a leave of leisure, it perhaps reaches its apex in southern Alberta, just west of Calgary. I'm talking about the May long weekend of course – specifically, the mayhem that happens each spring in our province's wilderness, in areas whose names in recent years have been linked to power-driven debauchery: Waiparous, Indian Graves, and McLean Creek. Mayhem that is punctuated by motorized recreationists terrorizing the landscape and breaking laws, and by death, injury, and damage to thousands of dollars worth of property.

After the howl of engines died to a mere growl this year, the stats quickly spread. Stories of an estimated 5,000 people descending on the McLean Creek Forest Land Use Zone, more than 450 tickets handed out, 11 arrests made for alcohol-related incidents, and outstanding warrants. There were accounts of burned-out vehicles being dumped in the area and gate locks cut as thousands of weekenders snuck onto private land to camp. A meadow in the area was "ripped to shreds," prompting Ken MacKay, a Fish and Wildlife Officer to tell the *Calgary Herald*, "The environmental destruction being done here is, well, it's hard to find a word for it. It just keeps getting worse every year."

When the weekend was over and it was time to head back home, revelers found that their own carousing had left them stranded, the original access trails mired and impassable from the heavy off-highway use. Three hundred people were trapped, forced to line up behind a locked gate and wait for Husky Oil and Fish and Wildlife to let them out. Officers handed out written warnings before letting them go home.

The public's response in the days following was almost as loud as the sound of engines in the woods that weekend. The destruction was on the tip of pens and tongues of local journalists.



Government policy and regulation related to OHV use must be backed up with adequate monitoring and enforcement capacity to address the increasing impacts on our public lands and wilderness areas. PHOTO: H. UNGER

Letters to editors assigned the offending parties names such as "yahoos" and "subhuman clowns." In an email to Alberta Wilderness Association (AWA), Fred Thiessen, who was born and raised in Alberta's foothills, wrote, "The ruination and destruction by thoughtless people is a disgrace that will rob present and future generations of the beauty and peaceful enjoyment of our beautiful wilderness areas."

Motorized recreationists are taking the brunt of the criticism for the disrespect and damage done to our wilderness areas. However, spokespeople for the off-highway vehicle (OHV) community laid the blame on a few bad apples and groups of partying graduates. Tim Garton of the Alberta United Recreationalists Society told the *Calgary Herald* that "there's a misconception about this environmental damage all being caused by [OHV users]." In an email to AWA, Mike Mack, a self-confessed "avid off-road fan," wrote that he was "worried that the stupidity of the few is soon going to cost the responsible

outdoorsmen, hobbyist, and outdoor fans the access and use of the outdoor areas."

Certainly, it would be a mistake to say that all people who ride OHVs are irresponsible, rip-and-shred, environmental malefactors. Some local ATV and 4X4 groups have worked hard to improve things in their areas. They lead clean-up initiatives, conduct trail maintenance, and sit on management committees. But a significant proportion of OHV users are not part of any association and look to the province's wilderness areas as a weekend free-for-all.

Whether they blame the odd miscreant or the whole user group, many Albertans are concerned about motorized recreation throughout our province's wilderness areas. Last summer, AWA conducted a recreational user survey in the Bighorn in west-central Alberta which found that motorized recreationists were the most often-mentioned hindrance to survey respondents' optimal experience in the area (*WLA*, February 2008).

Alison Dinwoodie of the Stewards

By the Numbers

- Proportion of Albertans who say they take part in ATV/OHV activities¹ – 9%
- Approximate proportion of provincial public land off-limits to motorized recreation² – 9%
- Proportion of Albertans who think OHVs should not be allowed in provincial parks³ – 64%
- Vegetation loss after 32 passes of an ATV⁴ – up to 99%
- ATV tracks still visible one year later⁵ – up to 85%
- Maximum fine for damaging public land⁶ – \$1,000
- CO₂ emissions released by 2- and 4-stroke ATVs⁷ – 4,000 times more than modern cars

^{1,3} Government of Alberta, *Alberta Recreation Survey*, 2004.

² AWA analysis, 2002.

^{4,5} Castle-Crown Wilderness Coalition, “Impacts of Off-Road Vehicles on Wildlands: A Review,” 1995.

⁶ *Edmonton Journal*, July 26, 2002.

⁷ Bluewater Network, “Off the Track: America’s National Parks Under Siege,” 1999.

of Alberta’s Protected Areas Association says that motorized recreation should definitely not be allowed in the province’s protected areas designated as Wilderness Areas, Ecological Reserves, Natural Areas, or Wildland Provincial Parks. Currently, some designated trail systems exist within Alberta’s Provincial Parks, Recreation Areas, Natural Areas, and Wildland Provincial Parks. As well, Alberta Sustainable Resource Development designates and manages Forest Land Use Zones, such as the Ghost (Waiparous) and McLean Creek, within Alberta’s forest reserves in an attempt to control recreational use. But most of Alberta’s public land is open to motorized recreation with no legislation to protect sensitive areas or ecological values.

Regardless of how one feels personally about OHVs on the landscape, it is probably safe to say that they are here to stay and that their recreational use is increasing throughout the province – in part, I suspect, because of our booming economy that allows for increased disposable income to be spent on weekend toys. So what are we to do? There is clearly a problem. People are upset, ecological damage is being done, and conflicts are arising among the many different user groups of Alberta’s wilderness.

In response to the long weekend at McLean Creek, many expected to see the government clamp down on motorized recreation use. There were rumours

of trail clampdowns similar to what happened in the Ghost-Waiparous area two years ago and in Willow Creek last year. There was talk of a long weekend liquor ban in McLean Creek. But what we got instead was the promise of more campgrounds.

“We’re looking at ... creating more product – creating more campgrounds, more recreation areas for Albertans,” Minister of Tourism, Parks and Recreation (TPR) Cindy Ady told the *Calgary Sun*. “There are a lot of responsible users out there, and if we can offer a whole variety of product, people can use it and not tear up the environment.”

The idea is – and Ady tells us this comes straight from the Premier himself – that Albertans are being forced to crowd into the province’s campgrounds, annoying others, or to camp on restricted land. Even if OHV users Mack and Garton are right that it is only a few boorish individuals who are trashing our wilderness, will those individuals be interested in substituting their random camping for more sedate, regulated camping sites? Is the problem really that these individuals can’t find a campsite, or is it that they prefer areas far away from any monitoring or enforcement of rules?

The astounding response from the Alberta government in the wake of the McLean Creek debacle is reason for anxiety, an indication that Alberta is still plodding along with the idea that our environment is there only

for our ravenous consumption. The Alberta government is set on adding even more infrastructure to an already overdeveloped landscape. This is supported by initial discussions with TPR staff last fall about the new Plan for Parks, still on the drawing board. At that time, TPR indicated that the plan would focus on infrastructure and facility development instead of the creation of more protected areas and real security for Alberta’s wild spaces for their own sake. Even Ady’s use of the term “product” for recreational opportunities in our wilderness indicates a continuation of this mindset.

There is no denying that as Alberta’s population grows, more people want leisure and recreation opportunities, motorized or otherwise, and are drawn to the majestic beauty of our province’s wild places. But in offering those opportunities, we must not sacrifice the little wilderness we have left, already heavily under threat in Alberta. As the pressures on the environment continue to grow, the issue of OHVs on the provincial landscape will have to be addressed.

AWA supports safe, responsible motorized recreation on designated trail networks in areas appropriate for that use. However, the damage caused by off-highway vehicles is well documented. OHV use can cause intense soil disruption through erosion, compaction, and sedimentation. Vegetative cover is destroyed and tree roots exposed. Invasive alien plant species can make their way into areas on a vehicle. Where OHVs cross creeks and rivers, siltation



Monitoring OHV trail damage in the Bighorn. PHOTO: AWA FILES



“Un Bison en Avril” 36x48, encaustic ©BIGOUDI

increases, which can negatively affect water quality and aquatic habitat. New trails add to the linear disturbance of wildlife habitat and the noise can result in territory abandonment and lost reproduction in some species. With these many impacts, it is important that we carefully consider where to permit motorized recreation in the province and not allow it to continue or arise in ecologically sensitive areas, in places that are protected by legislation or policy for the maintenance of the environment, or at the expense of important wildlife or watershed values.

The current laissez-faire attitude of allowing recreational OHV access to almost all of our public land must come to an end. A proactive approach to environmental protection must be taken,

with the restriction of OHVs to private land and only expressly designated trail networks on public land. There should be no off-route travel on public land except in specially designated “fritic areas.” The Alberta government – with the help of its citizens – must begin to find appropriate places for motorized recreation and construct high-standard trails that allow responsible recreation opportunities without sacrificing our remaining wilderness. And while, like most of us, motorized recreationists are drawn to the beautiful, wild, and pristine places of Alberta, they must accept that some areas, including the mountainous regions, are just too sensitive to allow them to travel there in any manner other than on foot.

Once trails are established, they

must be continually assessed to ensure sustainability, with studies such as the one AWA is currently conducting of a trail network for both motorized and non-motorized recreation in the Bighorn (WLA, August 2007). Where trails are found to be lacking, increased maintenance must be carried out, or in the case of trails that are unsustainable due to being situated in inappropriate areas, trails should be closed and restoration work completed. With the establishment of designated trails, it is equally important that we have strong legislation, active education programs, and adequate numbers of enforcement personnel to comprehensively address the use and abuse of public land. Above all, as the government works to develop a program that addresses motorized recreation, it must continually offer thorough and effective consultation with Albertans regarding what happens on the public land the government manages in trust of its citizens.

As McLean Creek showed us this past May, left unchecked, the damage is great, the outcry thunderous, and the lack of adequate present management readily apparent. With a growing population, as well as a growing number of OHVs throughout the province, it is vitally important that we act now to find a solution that will both allow for responsible recreation and the continued vitality of our rich and diverse wild spaces.

What You Can Do

Let the Government of Alberta know what you think about OHVs on the landscape and in Alberta’s wilderness. Write or call your MLA, Premier Stelmach, Minister of SRD Ted Morton, and Minister of TPR Cindy Ady, and let them know how you want to see motorized recreation managed on public land. Addresses and phone numbers can be found through the government website at Alberta.ca, or by calling the government toll-free number, 310-0000.

If you are interested in commenting on the expansion of campgrounds in the McLean Creek area, TPR is currently accepting comments on the Draft Management Plan for Kananaskis Country Provincial Recreation Areas (see page 20). More information and a feedback form are available at tpr.alberta.ca/parks/consult/kcpra. 🌲

GRIZZLY BEAR RECOVERY TEAM DISBANDED BEFORE GRIZZLY RECOVERY BEGINS

By Nigel Douglas, AWA Conservation Specialist

The guy on the trail ahead is quivering with excitement, waving his arms at us discreetly but frantically. Is he in trouble? As we draw nearer, he puts his finger to his lips, pointing off to the side of the trail. And then we see it. A large brown back frosted with grey, ambling away from us through the bushes – a grizzly!

The bear comes out into the open 50 feet away. Effortlessly, he rolls a large rock over that would take all of my strength to move. He begins digging, kicking up clumps of earth and snuffling audibly as he picks through the glacier lily roots.

During a hasty whispered conference, we decide to carry on up the trail past the bear. Bear spray at the ready, we edge cautiously along the path, but he keeps his back to us, intent on his foraging. We're close enough to smell him. He turns to give us a quick glance, but he's far too busy to pay us much attention.

Back at camp that evening, we reflect on the moment – what made it so magical was observing such a magnificent animal in his natural environment, minding his own business, just being a bear. What grizzlies need more than anything in Alberta is to be left alone; to have the space to go about their business of being bears.

Unfortunately, this being Alberta, they seem to be no nearer to this goal than they were six years ago when Alberta's grizzly recovery process began. In fact they are much worse off than we thought they were. Detailed genetic population studies over the past four years have seen population estimates drop steadily from 1,000 bears in 2002 to less than 500 today.

So it was with considerable surprise that the provincial Grizzly Bear Recovery Team learned in June 2008 that it was being disbanded, its work apparently finished. In a June 10 letter to the Team, Ken Ambrock, Assistant Deputy Minister for Sustainable Resource Development, wrote: "With the finalization of the [Grizzly Recovery] plan, the work of the Recovery Team is complete."



A grizzly bear minding his own business in the Highwood area of Kananaskis Country.

PHOTO: N. DOUGLAS

This was news to the Recovery Team! "The statement that our recovery team's work is complete was a surprise to me," said Dr. Robert Barclay, chair of the Team, in a *Calgary Herald* interview.

The Recovery Team had expected to continue to be involved in the recovery process, as implementation of the newly passed Recovery Plan began. Indeed, the plan itself states, "The Team assists the Minister ... with Plan implementation," and goes on to stress that "the Plan is a dynamic document. The initial life span of the Plan is five years, during which the Team will meet at least annually to review and update the Plan as required."

As things stand, there is a very real risk that the report will be the pinnacle



PHOTO: C. OLSON

of grizzly recovery in Alberta, with none of the necessary habitat protection and restoration – the only thing that will benefit the bears. Grizzlies have benefited little from the recovery process so far. The suspension of the spring grizzly hunt in 2006 – four years and 51 dead bears after government scientists first called for the suspension – certainly helped grizzlies. Counting bears, mapping, and education do nothing in themselves to help the bears.

Dismissal of the Recovery Team sends the message that, with the publishing of the Recovery Plan, the recovery process has run its course. But of course the plan is just 68 pages filled with words, maps, and graphs. In itself it will do nothing to stop the demise of grizzlies in Alberta, nothing to give bears the freedom they need simply to be bears. Surely the work of the Recovery Team is not "complete" – now is the time for the recovery process to begin! 🐾

For more information, check out AWA's Save the Grizzly website at www.savethegrizzly.ca.

CANMORE ARTIST “CAN’T BEAR IT”



The “Can’t bear it” series was born when two other painters and myself decided to join our talents to create an art exhibition about the bear in our society. With these unusual pieces, I was responding to the trend of people using the bear image in a “cute” and “inoffensive” way for their marketing and logos. Coming from Canmore, and living in the Rockies, I see examples of this every day. People use the bear image for their businesses and advertising, building up a distorted myth about these wild animals that should be allowed to remain wild. Therefore, I wanted to create some paintings that would show the bear in different circumstances using some unusual colours. I came up with these three bears: the aggressive bear, the passive bear, and the bored bear. Behind the bored bear, I gathered some local newspaper clippings about the bad news we hear every week about hunting and government policies to add to my message. This message is quite simple: Leave them alone, please.

– Bigoudi



“Can’t bear it #1” 57x57 inches, oil pastel & encaustic ©BIGOUDI



“Can’t bear it #3” 48x48 inches; newsprint, oil pastel & encaustic ©BIGOUDI



“Can’t bear it #2” 72x48 inches, oil pastel & encaustic ©BIGOUDI

***Encountering Nature:
Towards an Environmental Culture*
by Thomas Heyd**

Reviewed by Sarah Crook

Dr. Thomas Heyd, a philosophy lecturer at the University of Victoria, is deeply concerned about our western tendency to see nature as separate from ourselves, as an object to be exploited. His book *Encountering Nature* contains a message made for Alberta, where he once lived: our long-held view that the natural world is primarily a resource for human endeavours must be jettisoned.

Heyd believes that for the environment to survive the pressure of human needs (or wants), we must develop an “environmental morality,” recognizing that non-human entities have intrinsic value outside of human use. Without this fundamental change, even arguments based on self-interest won’t stop ongoing environmental degradation. Heyd argues that for such a change to occur, we must learn about nature through direct encounters with it. Knowledge acquired indirectly, through scientific study for example, is insufficient: nature must be *experienced*.

If we acted in accordance with such a code, how would our attitudes and practices change? Heyd considers this question in the context of the workplace and provides examples from Latin America of traditional ways of living that include the environment as deserving of care and respect. He discusses what we can learn from such models to foster a similar way of thinking in our own society.

Heyd goes on to examine the mechanisms by which we come to appreciate non-human nature. The one that our culture relies heavily upon is scientific knowledge. Heyd believes that our appreciation and understanding is informed in equally valid ways by other “stories,” especially those arrived at through personal experience. For readers who live in close connection with their land and know intimately the life that shares it with them, yet find such

knowledge discounted as unscientific, this will doubtless strike a chord.

In support of this argument, Heyd provides three examples of encountering nature: walking in the landscape, as exemplified by the wanderings of the Japanese poet Matsuo Bashō; allowing a rock art site to inform our appreciation of the surrounding landscape; and responding to a piece of reclamation art by Robert Morris, constructed in a former gravel pit. Since Heyd once lived in Calgary, this discussion includes references to both Nose Hill and Kananaskis Country.

The last section of the book deals with the relationship between nature and culture: a relationship we need to understand, he argues, if we are to co-exist with, rather than dominate, the natural world. His thesis that nature and culture need not be in opposition is buttressed by examples: the medicine wheels of the northern prairies, sites where land has been “restored,” and botanic gardens.

Of these, the restoration example is of special interest in the current Alberta context, where “reclamation” is often cited as the solution to negative human impact. Heyd starts with the philosophical difficulties associated with restoring cultural objects (such as buildings) and discusses how this informs what we achieve by “restoration” of nature. It is impossible, he says, to replace in any true sense a destroyed natural landscape; he suggests that where destruction is justified, rather than attempt some kind of ersatz replacement, we should “restore” but leave evidence that this is a changed landscape. Thus the marks we leave upon the land, the “story” of its use, become part of its history and an integral part of what it *now* is. He suggests that we “restore” through removing

obstacles to reclamation by natural processes and openly acknowledge that what results is a different creation – possibly beautiful, possibly deeply disturbing, but certainly *not* natural.

I will not pretend that this is an easy book to read. Its complexity requires attentive reading, especially if, like me, you are not familiar with philosophical discussion. However, the author helps the lay reader by using (fairly!) straightforward language and including helpful footnotes (including definitions of uncommon words such as “autochthonous” and reminders of things like the difference between “morals” and “ethics”). By repeatedly returning to the structure of his argument, he allows readers to choose what interests them and to easily pick up the threads of the discourse. Indeed, many of the chapters, while contributing to the book, can be read as separate essays.

Although readers may find, as I did, that depth of coverage is sometimes sacrificed to breadth of scope, the effort of following Heyd’s stimulating and thought-provoking arguments is well worth the trouble.

In his “Afterword,” Heyd addresses the question of how we move from recognizing we risk disaster by ignoring the environmental consequences of our actions to motivating people to take action. While he does not provide any final answer, his book gives us hope that there are answers to be found. 🍷



“Prairie Movement” 60x40 inches, encaustic ©BIGOUDI

Paying Paul, Robbing Peter

Dear Editor,

In “Compensation for Disturbed Wetlands” (*WLA* June 2008), the author states that “restoration of natural wetland habitats in grassland settings has been highly successful.” The article continues in that positive vein with a quote from Ducks Unlimited Canada (DUC).

I think this view is simplistic and false, at least in the case of Beaverhills Lake, east of Edmonton. There, the creation of upstream duck ponds has been a matter of “paying Paul by robbing Peter,” Peter being Beaverhills Lake, an internationally famous Ramsar wetland and Hemispheric Shorebird Reserve. In 1987 it was also designated as a Wetland for Tomorrow under the North American Waterfowl agreement. The lake is currently less than a third of its former size.

Beaverhills Lake is a collection basin for a large watershed. It has no outlet and evaporation exceeds annual precipitation. This means that spring run-off from upstream feeder creeks is vitally important to maintain the lake. These limitations were ignored by DUC when it began to build its impoundments in 1974. The number of projects has grown to 19, and each of these contains up to three weirs. Based on Alberta Environment’s own information and data, DUC projects are withholding one million cubic metres of water from the lake every year. This is in addition to the half a million cubic metres DUC allocates to local farmers, who use the water to flood hay meadows and – get this! – to drown out pocket gophers.

In September of 2006, Beaverhills Lake had completely dried up. The wet spring of 2007 brought it back up somewhat to its current size of about 30 km², which is still way down from the 140 km² it used to be in the 1970s and 1980s. Granted, there are natural causes for the lake’s demise. Annual precipitation was below average for several years. But there is no doubt that the upstream withdrawals have aggravated the drought.

The sad thing is that DUC denies



“Raven” 36x48 inches, encaustic ©BIGOUDI

that its projects have harmed the lake. Furthermore, federal and provincial government agencies, who were signatories to the international treaties, have abrogated their responsibility to protect the lake from mismanagement. They, as well as the local birdwatching community, seem to have shrugged the problem off. Hesitant to criticize a highly regarded organization such as DUC, they simply place the blame on the regional drought and global warming.

This view is not supported by the facts. I have researched the weather data for central Alberta that go back 124

years and are available from Environment Canada. While cyclic ups and downs are normal, the most recent decade was not drier than some other decades in the past. And the overall mean temperatures have remained the same for 124 years. The data were looked at by a statistician, who reports that the regression line is flat, indicating no difference at all over time.

– Dick Dekker, Edmonton

Detailed report available on request from ddekker1@telus.net.

AWA'S 2008 AUTUMN HIKES

Participating in AWA's hikes program is a great way to explore the wilderness of Alberta, discover our province's diverse wildlife, and learn about the work we are doing to protect these magnificent landscapes. For more information about all our summer hikes, see the 2008 hikes brochure or visit our website: AlbertaWilderness.ca.

Pre-Registration Is Required for All Events

Online: shop.albertawilderness.ca
By phone: (403) 283-2025
Toll Free: 1-866-313-0713

WEEKEND CANOE TRIP

McClelland Lake

With Darin Zandee

Saturday, August 30 – Monday, Sept. 1

Evening talk, Friday,
August 29, Fort McMurray

\$100 AWA members
\$125 non-members

Explore the heart of an 8,000-year-old wetland complex deep in the boreal forest. North of Fort McMurray, the rare patterned fen and other wetlands surrounding McClelland Lake rival the Rockies in scenic beauty. This is one of Canada's least-known natural treasures.

DAY HIKES

\$20 AWA members
\$25 non-members

Lure of the Larches

With Vivian Pharis

Saturday, September 20

As autumn reaches the Rocky Mountains, so begins one of nature's wonders – the turning of the larches. Join us as we hike into Kananaskis to visit these remarkable coniferous trees during this special time of year.

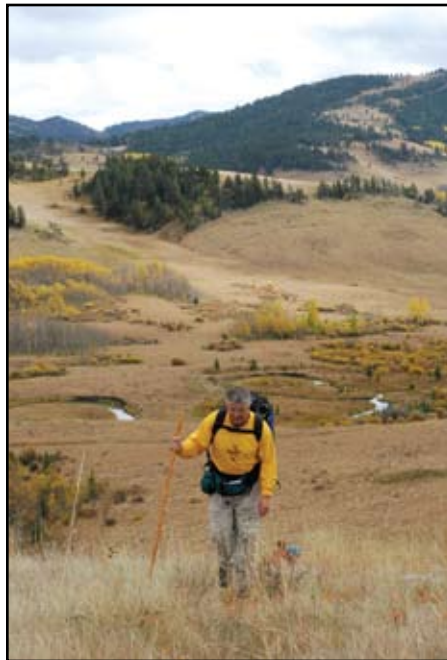


PHOTO: C. WEARMOUTH

Autumn in the Whaleback

With Bob Blaxley

Wednesday, September 24 & Saturday,
October 4

Running parallel to the Rocky Mountains in southwestern Alberta, the Whaleback is considered one of the best representatives of montane landscape, flora, and fauna in Canada. Explore this magnificent area in its fall plumage on this late-season outing.



PHOTO: J. HILDEBRAND

PRAIRIE BLUFF FIELD DAY

Thursday, August 21

9:00 a.m. – 5:00 p.m.

\$25 AWA members

\$40 non-members

Join us for a field day on Prairie Bluff in the Castle region of southwest Alberta. The day will include an interpretive hike to the top of Prairie Bluff and an introduction to three research projects currently underway: whitebark pine regeneration, regeneration of an old industrial access route, and rare and invasive plant surveys.

WILD WEST GALA

Friday, September 26

Red & White Club, Calgary

AWA members: \$85

Non-members: \$100

Table of 8: \$800

Great food, superb wine, and first-class entertainment all night long, featuring singer-songwriter Barry Hertz and friends, auctioneer Jessie Starling, and our own Nigel Douglas. Be prepared for a surprise or two!

TUESDAY TALKS – FALL 2008

Mark your fall calendar for another great series of Tuesday Talks. Educational, entertaining, and nourishing, these evenings have become social events as well. Meet old friends, make new ones, and learn more about Alberta's wilderness and wildlife.

Pre-registration is advised for all talks.

Location: See individual talks

Time: 7:00 – 9:00 p.m.

Cost: \$5 per adult; \$1 for children

Contact: (403) 283-2025

Toll-free: 1-866-313-0713

Suffield National Wildlife Area – Canada's Prairie Treasure

Tuesday, September 30

With Cleve Wershler

AWA Office, 455 – 12 St. NW, Calgary

Join us to celebrate the beauty of a rare grassland remnant in southeastern Alberta. A week before the start of the hearing into EnCana's proposal to drill 1,275 additional wells in this stunning federally protected wildlife refuge, biologist and nature photographer Cleve Wershler will provide insight into the area's significance on the Northern Great Plains.

How the Beaver Battled Drought – and Won!

Tuesday, November 25

With Dr. Glynnis Hood

AWA Office, 455 – 12 St. NW, Calgary

With the increased loss of Alberta's wetlands due to climate change and development, beavers might be helping our wetlands more than we think.

University of Alberta's Dr. Glynnis Hood will share recent research on the role of beavers in mitigating the effects of drought in Alberta. Sometimes presented as pests, beavers may instead provide us with important ecological services.



PHOTO: WAYNE LYNCH

“The Spruce Kingdom: Life in the Boreal Forest” & “The Beauty and Biology of the Prairie Grasslands”

Tuesday, October 28

7:00 – 9:30 p.m.

With Dr. Wayne Lynch

John Dutton Theatre, W.R. Castell Public Library, Calgary

AWA Members: \$15.00 • Non-members: \$20.00

Don't miss this opportunity to spend an evening with Canada's most published photographer and natural history writer. In this double-header presentation, Dr. Wayne Lynch will share images and stories from his two favourite Canadian landscapes, the boreal forest and the grasslands.

All proceeds will support AWA's work in Alberta's grassland and boreal landscapes.



Alberta Wilderness Association Annual General Meeting

Saturday, November 15, 2008

Time: 10:30 a.m.

Location: 455 – 12 St. NW, Calgary

Registration: 1-866-313-0713 or
(403) 283-2025

The 20th Annual

Wild West Gala

RED & WHITE CLUB, MCMAHON STADIUM
SEPTEMBER 26TH, 2008
 ALBERTA WILDERNESS ASSOCIATION

ENTERTAINMENT BY:
 BARRY HERTZ & FRIENDS
 NIGEL DOUGLAS

AUCTIONEER:
 JESSIE STARLING

FUN & GAMES START AT 6:00PM
 DINNER AT 7:00PM
 LIVE AUCTION AT 8:15PM
 ENTERTAINMENT ALL NIGHT LONG

\$85 FOR AWA MEMBERS
 \$100 FOR NON-MEMBERS
 \$800 FOR A TABLE OF EIGHT
 REMEMBER TO WEAR YOUR BEST DUDS!

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